Nallamuthu Gounder Mahalingam College

Vision

Our dream is to make the College an institution of excellence at the national level by imparting quality education of global standards to make students academically superior, socially committed, ethically strong, spiritually evolved and culturally rich citizens to contribute to the holistic development of the self and society.

Mission

Training students to become role models in academic arena by strengthening infrastructure, upgrading curriculum, developing faculty, augmenting extension services and imparting quality education through an enlightened management and committed faculty who ensure knowledge transfer, instil research aptitude and infuse ethical and cultural values to transform students into disciplined citizens in order to improve quality of life

Department of Information Technology

Vision

The Vision of our Department is to assist the student in becoming proficient in using latest Technologies, and critical thinking being prepared for the next level of education and successfully attaining the skills and proficiencies required of today's work force.

Mission

The Information Technology department is committed to providing the highest quality technology services and support, thereby enhancing the operation, and educational capabilities among the students.

Program Educational Objectives:

PEO1	Prepare the students to engage in independent learning for developing the Applications based on industry and social needs.
PEO2	To train students to a level where they can readily compete for the higher educational programs.
PEO3	To make students as computer professionals, who can be directly employed or start their own work as Programmer, Web Designer, Database User, Testing professional, Designer of a System and Network administrator or implementer.
PEO4	To familiar with the contemporary issues, latest trends in technological development and there by innovate new ideas and solutions to existing problems.
PEO5	To participate effectively as a member of a development team and undertake leadership roles in appropriate arena.

Program Outcomes:

PO1	**Disciplinary knowledge:** Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.
PO2	**Communication Skills:** Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.
PO3	**Critical thinking:** Capability to apply analytic thought to a body of knowledge; analyze and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.
PO4	**Problem solving:** Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.
PO5	**Analytical reasoning:** Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints.
PO6	**Research-related skills:** A sense of inquiry and capability for asking relevant/ appropriate questions, problematising, synthesizing and articulating; Ability to recognize cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyze, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation.
PO7	**Cooperation/Team work:** Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.
PO8	**Scientific reasoning:** Ability to analyze, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.

PO9	**Reflective thinking:** Critical sensibility to lived experiences, with self awareness and reflexivity of both self and society.
PO10	**Information/digital literacy:** Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.
PO11	**Self-directed learning:** Ability to work independently, identifies appropriate resources required for a project, and manages a project through to completion.
PO12	**Multicultural competence:** Possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with diverse groups.
PO13	**Moral and ethical awareness/reasoning:** Ability to embrace moral/ethical values in conducting one's life, formulates a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. Capable of demonstrating the ability to identify ethical issues related to one's work, avoid unethical behavior such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work.
PO14	**Leadership readiness/qualities:** Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination, in a smooth and efficient way.
PO15	**Lifelong learning:** Ability to acquire knowledge and skills, including 'learning how to learn', that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development / reskilling.

Program Specific Outcomes:

PSO1	**Embracing the Cutting Edge:** To identify and utilize the latest updates on recent technologies by applying knowledge on Artificial Intelligence, Internet of Things, and Mobile computing.
PSO2	**Strategic Fusion:** To develop the ability to integrate Information technology with business applications and to impart knowledge on the fundamentals of research.

Mapping

Traceability Matrix of Generic Program Learning Outcomes with Generic Program Education Objectives

	PEO1	PEO2	PEO3	PEO4	PEO5
PO1: Disciplinary knowledge	2	1	2	3	2
PO2: Communication Skills	3	2	2	3	2
PO3: Critical thinking	1	1	3	2	3
PO4: Problem solving	1	3	2	2	2
PO5: Analytical reasoning	1	2	3	1	3
PO6: Research-related skills	2	3	1	1	1
PO7: Cooperation/Team work	3	2	3	3	2
PO8: Scientific reasoning	3	1	3	3	1
PO9: Reflective thinking	1	1	3	3	1
PO10: Information/digital literacy	3	1	2	3	2
PO11 : Self-directed learning	3	3	3	2	2
PO12 : Multicultural competence	1	1	2	2	2
PO13 : Moral and ethical awareness/reasoning	2	1	2	2	2
PO14 : Leadership readiness/qualities	1	1	2	1	3
PO15 : Lifelong learning	3	3	2	3	2

(POs and PSOs with COs): 1 – Low, 2 – Medium, 3 - High

NGM College - Department of Information Technology
Scheme of Examination For 2026 - 2029
Choice Based Credit System & OBES

SEMESTER – I

Part	Subject Code	Title of the Paper	Hrs / Week		Hrs / Sem.	Exam Hrs.	Maximum Marks		Total Marks	Credits
			L	P	T		Internal	External		
I	26UTL1C1	Tamil Paper - I	5	-	-	3	25	75	100	3
	26UHN1C1	Hindi Paper - I								
	26UFR1C1	French Paper – I		-	-					
II	26UEN101	Communication Skills – I	5	-	-	3	25	75	100	3
III	26UIT101	CC - I : Programming in 'C'	4	-	4	3	25	75	100	4
	26UIT102	CC - II : Computer System Architecture	5	-	-	3	25	75	100	4
	26UIT1A1/ 26UIT1A2	Allied : Mathematics - I (Vedic & Statistics / Numerical Methods)	4	-	5	3	25	75	100	4
	26UIT103	CC Lab - I : Programming in 'C'	-	4	-	3	20	30	50	2
IV	26UIT1S1	SS Lab. – I : Web Designing	-	-	-	2	-	50	50	2
	26EVS101	AECC I: Environmental Studies	2	-	-	2	-	50	50	2
	26HEC101	VE: Human Excellence - Personal Values & SKY Yoga Practice - I	1	-	-	2	20	30	50	1
V		Extension Activities – Annexure II	-	-	-	-	-	-	-	-
EC		Certificate Courses Annexure III	-	-	-	-	-	-	-	Grade
		Online Course (Optional) (MOOC / NPTEL / SWAYAM)	-	-	-	-	-	-		Grade
Total			26	4	9				700	25

SEMESTER – II										
Part	**Subject Code**	**Title of the Paper**	**Hrs / Week**		**Hrs / Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**		
I	26UTL2C2	Tamil Paper - II	5	-	-	3	25	75	100	3
	26UHN2C2	Hindi Paper - II		-	-					
	26UFR2C2	French Paper – II		-	-					
II	26UEN202	Communication Skills – II	5	-	-	3	25	75	100	3
III	26UIT204	CC - III : Object Oriented Programming with Java	4	-	-	3	25	75	100	4
	26UIT205	CC - IV : Data Structures	5	-	-	3	25	75	100	4
	26UIT2A1 /26UIT2A2	Allied : Mathematics II (Discrete Mathematics/ Operations Research)	4	-	10	3	25	75	100	4
	26UIT206	CC Lab - II : Programming in Java with Data Structures	-	4	-	3	20	30	50	2
IV	26UIT2S1/ 26UEL2S2	SEC I: Naan Mudhalvan: Web Programming Lab. / Professional Skills	-	2	-	2	-	50	50	1
	26HEC202	**VE:** Human Excellence - Family Values & SKY Yoga Practice – II	1	-	-	2	20	30	50	1
V		Extension Activities - Annexure II	-	-	-	-	-	-	-	-
EC		Certificate Courses Annexure III	-	-	-	-	-	-	-	Grade
		Online Course (Optional) (MOOC / NPTEL / SWAYAM)	-	-	-	-	-	-	-	Grade
Total			24	6	10				650	22

SEMESTER – III										
Part	**Subject Code**	**Title of the Paper**	**Hrs / Week**		**Hrs / Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**		
I	26UTL3C3	Tamil Paper - III	4	-	-	3	25	75	100	3
	26UHN3C3	Hindi Paper - III		-	-					
	26UFR3C3	French Paper – III		-	-					
II	26UEN3C3	Communication Skills– III	4	-	-	3	25	75	100	3
III	26UIT307	CC - V : Operating Systems	4	-	-	3	25	75	100	4
	26UIT308	CC - VI : Relational Database Management System	4	-	-	3	25	75	100	4
	26UIT3A1/ 26UIT3A2	Allied : Microprocessor / Electronic Devices and Circuits	4	-	-	3	25	75	100	4
	26UIT309	CC Lab. - III : RDBMS	-	4	-	3	20	30	50	2
	26UIT310	CC Lab. – IV: Advanced Excel	-	4	-	3	20	30	50	2
IV	26UIT3N1/ 26UIT3N2	EDC - I : Lab.: Social Media Analytics / Basics of Hardware Annexure-I	1	-	-	2	-	50	50	1
	26HEC303	**VE:** Human Excellence - Professional Values & Ethics – SKY Yoga Practice - III	1	-	-	2	20	30	50	1
	26GKL301	General Awareness – Self Study	SS	-	-	2	-	50	50	1
V	26UHW301	Health and Wellness	2 #	-	-	-	-	-	-	1
		Extension Activities Annexure-II	-	-	-	-	-	-	-	-
EC		Certificate Courses Annexure III	-	-	-	-	-	-	-	Grade
	26UIT3VA	VAC I : Annexure-III	-		-	-	-	-	-	Grade
			22	8	-	-	-	-	750	26

SEMESTER – IV										
Part	**Subject Code**	**Title of the Paper**	**Hrs / Week**		**Hrs/ Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**		
I	26UTL4C4	Tamil Paper - IV	4	-	-	3	25	75	100	3
	26UHN4C4	Hindi Paper - IV		-	-					
	26UFR4C4	French Paper – IV		-	-					
II	26UEN4C4	Communication Skills– IV	4	-	-	3	25	75	100	3
III	26UIT411	CC - VII : Data Communication and Networks	5	-	-	3	25	75	100	4
	26UIT412	CC - VIII : Advanced Java Programming	4	-	5	3	25	75	100	4
	26UIT4A1/ 26UIT4A2	Allied : Software Engineering/Software Testing	4	-	-	3	25	75	100	4
	26UIT413	CC Lab.- V : Advanced Java	-	5	-	3	20	30	50	3
IV	26UIT4S1/ 26UIT4S2	SEC II: Naan Mudhalvan: DevOps Fundamentals / Quantitative Aptitude	-	2	-	2	-	50	50	1
	26UIT4N1 / 26UIT4N2	EDC - II : Lab. : Data Analytics / Workplace Digitization –Annexure-I	1	-	-	2	-	50	50	1
	26HEC404	VE: Human Excellence - Social Values & SKY Yoga Practice – IV	1	-	-	2	20	30	50	1
V		Extension Activities - Annexure II	-	-	-	-	-	-	-	1
EC		Certificate Courses Annexure III	-	-	-	-	-	-	-	Grade
	26UIT4VA	VAC II: Annexure III	-		-	-	-	-	-	Grade
	Total		23	7					700	25

SEMESTER – V										
Part	**Subject Code**	**Title of the Paper**	**Hrs / Week**		**Hrs / Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**		
III	26UIT514	CC -IX : Full Stack Web Development using Python	5	-	-	3	25	75	100	4
	26UIT515	CC - X : Digital Security	5	-	-	3	25	75	100	4
	26UIT5E1/ 26UIT5E2/ 26UIT5E3	**DSE -I:** #	5	-	-	3	25	75	100	4
	26UIT516	CC Lab - VI : Open Source Methodologies	-	5	-	3	20	30	50	2
	26UIT517	CC Lab - VII : Full Stack Development	-	5	-	3	20	30	50	2
IV	26UIT5S1/ 26UIT5S2	SEC III: Digital Content Development Lab. I / II	-	4	-	-	-	50	50	2
	26HEC505	VE: Human Excellence - National Values & SKY Yoga Practice - V	1	-	-	2	20	30	50	1
EC	26UIT5AL	ALC – I Cyber Law (Optional) – Self study Annexure III	SS	-	-	-	-	100	100	Credit **
	26CSD501	Soft Skills Development - I	-		-	-	-	-	-	Grade
		MOOC Certificate Courses								
Total			16	14	5				500	19

Discipline Specific Elective (DSE) – I #
26UIT5E1: Data Mining & Warehousing
26UIT5E2:Cloud Computing
26UIT5E3: Mobile Computing

SEMESTER – VI										
Part	**Subject Code**	**Title of the Paper**	**Hrs / Week**		**Hrs/ Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**		
III	26UIT618	CC - XI : Visual Programming	5	-	5	3	25	75	100	4
	26UIT6E4/ 26UIT6E5/ 26UIT6E6	**DSE – II :** ##	5	-	-	3	25	75	100	4
	26UIT6E7/ 26UIT6E8/ 26UIT6E9	**DSE – III :** ###	6	-	-	3	25	75	100	5
	26UIT619	CC Lab - VIII : Software Testing & Data Visualization Tools	-	6	-	3	20	30	50	3
	26UIT620	CC Lab IX: Visual Programming	-	5	-	3	20	30	50	2
	26UIT621	Project	-	-	-	-	25	75	100	3
IV	26UIT6S1/ 26UIT6S2	**SEC IV** : Naan Mudhalvan: Generative AI Web development Lab. I / II	-	2	-	2	-	50	50	1
	26HEC606	**VE:** Human Excellence - Global Values & SKY Yoga Practice - VI	1	-	-	2	20	30	50	1
EC	26UIT6AL	ALC - II Digital Forensics (Optional) – Self Study Annexure III	SS -		-	-	-	100	100	Credit **
	26CSD601	Soft Skills Development - II	-		-	-	-	-	-	Grade
Total			18	12					600	23
Grand Total									3900	140

Discipline Specific Elective (DSE) – II ##	**Discipline Specific Elective (DSE) – III** ###
26UIT6E4: Machine Learning 26UIT6E5: Internet of Things 26UIT6E6: Digital Marketing	26UIT6E7 : Big Data Analytics 26UIT6E8 : Artificial Intelligence 26UIT6E9 : Block Chain Technology

List of Abbreviations:

CC – Core Course	GE – Generic Elective
AECC - Ability Enhancement Compulsory Course	SEC – Skill Enhancement Course
DSE – Discipline-Specific Elective	VAC –Value Added Course
ALC – Advanced Learner Course (Optional)	IKS - Indian Knowledge System

EDC - Extra Disciplinary Course;; VA-Department Specific Value Added Course;

*Extra Credits
**Credits – Based on course content maximum of 4 credits
EC – Extra Credit Course / Certificate Course / Co-scholastic Course / Job Oriented Course

Grand Total = 3900; Total Credits = 140

Annexure III

1. Gandhian Thoughts
2. Uzhavu Bharatham
3. Manaiyiyal Magathuvam
4. Value Added Courses
    i) UI / UX Designing (III Semester)
    ii) Statistical Computing using R (IV Semester)

Question Paper Pattern
(Based on Bloom's Taxonomy)

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

1. Theory Examinations: 75 Marks (Part I, II, & III)

(i) Test- I & II, ESE:

Knowledge Level	Section	Marks	Description	Total
K1 & K2 (Q1 - 10)	A (Q1 – 5 MCQ) (Q6 – 10 Define / Short Answer / MCQ)	10 * 1 = 10	MCQ / Define	**75**
K3 (Q11-15)	B (Either or pattern)	5 * 5 = 25	Short Answers	
K4 & K5 (Q16 – 20)	C (Either or pattern)	5 * 8 = 40	Descriptive/ Detailed	

2. Practical Examinations:

Paper	Maximum Marks	Marks for		Components for CIA		
		CIA	CEE	Tests	Observation Note	Record Note
Practical (Core / Elective)	50	20	30	10	05	05

3. Project:

Paper	Maximum Marks	Marks for		
		CIA	CEE	
			Evaluation	Viva-voce
Project	100	25	50	25

***** CIA – Continuous Internal Assessment & CEE – Comprehensive External Examinations

Components of Continuous Internal Assessment (CIA)

THEORY

Maximum Marks: 100; CIA Mark: 25; CEE Mark: 75;

Components		Calculation	CIA Total
Test 1	75	(75+75+15+10)/7	25
Test 2 / Model	75		
Assignment / Digital Assignment	15		
Others*	10		

*Others may include the following: Seminar / Socratic Seminars, Group Discussion, Role Play, APS, Class participation, Case Studies Presentation, Field Work, Field Survey, Term Paper, Workshop / Conference Participation, Presentation of Papers in Conferences, Quiz, Report / Content Writing, etc.

PROJECT

Maximum Marks: 100; CIA Mark: 25; CEE Mark: 75;

Components		Calculation	CIA Total
Review I	5	5+5+5+10	25
Review II	5		
Review III	5		
Report Submission	10		

Originality of Idea, Relevance to Current Trend, Candidate Involvement, and Presentation of Report for Commerce, Management & Social Work.

Synopsis, System Planning, Design, Coding, Input form, Output format, Preparation of Report & Submission for Computer Science cluster.

Continuous Internal Assessment for Project

For Computer Science Cluster

Maximum Marks: 100 Marks

Components for CIA: 25 Marks

Criterion	Mode of Evaluation	Marks	Total
I	Synopsis, Company Profile, System Specification, Existing System, Proposed System OR (For Android Developments) Planning Stage	05	25
II	Supporting Diagrams like system flowchart, ER, DFD, Use case and Table Design OR UI and UX Design Application Architect and Prototyping	05	
III	Coding, Input forms, Output format, Testing OR Development, Testing	05	
IV	Preparation of Report & Submission	10	

Components for CEE: 75 Marks

Components for CEE	Marks	Total	Grand Total
Evaluation			75
Title Relevance of the Industry/Institute	10	50	
Technology	10		
Design and Development Publishing	10		
Testing, Report	20		
Viva Voce			
Project Presentation	10	25	
Q&A Performance	15		

STUDENT SEMINAR EVALUATION RUBRIC

Grading Scale:

A	B	C	D
8-10	**5-7**	**3-4**	**0-2**

CRITERIA	A - Excellent	B - Good	C - Average	D - Inadequate
Organization of presentation	Information presented as an interesting story in a logical, easy-to-follow sequence	Information presented in logical sequence; easy to follow	Most of the information is presented in sequence	Hard to follow; sequence of information jumpy
Knowledge of the subject & References	Demonstrated full knowledge; answered all questions with elaboration **&** Material sufficient for clear understanding **AND** exceptionally presented	At ease; answered all questions **but** failed to elaborate **&** Material sufficient for clear understanding **AND** effectively presented.	At ease with information; answered most questions **&** Material sufficient for clear understanding **but** not clearly presented.	Does not have a grasp of information; answered only rudimentary Questions **&** Material not clearly related to the topic **OR** background dominated seminar
Presentation Skills using ICT Tools	Uses graphics that explain and reinforce text and presentation	Uses graphics that explain the text and presentation.	Uses graphics that relate to text and presentation.	Uses graphics that rarely support text and presentation
Eye Contact	Refers to slides to make points; engaged with the audience	Refers to slides to make points; eye contact the majority of the time	Refers to slides to make points; occasional eye contact	Reads most slides; no or just occasional eye contact
Elocution – (Ability to speak English language)	Correct, precise pronunciation of all terms The voice is clear and steady; the audience can hear well at all times	Incorrectly pronounces a few terms Voice is clear with few fluctuations; the audience can hear well most of the time	Incorrectly pronounces some terms Voice fluctuates from low to clear; difficult to hear at times	Mumbles and/or Incorrectly pronounces some terms Voice is low; difficult to hear

WRITTEN ASSIGNMENT RUBRIC

Grading Scale:

A	B	C	D	F
13-15	10-12	7-9	4-6	0-3

CRITERION	A - Excellent	B - Good	C - Average	D - Below Average	F - Inadequate
Content & Focus	Hits on almost all content exceptionally clear	Hits on most key points and the writing is interesting	Hits in basic content and writing are understandable	Hits on a portion of content and/or digressions and errors	Completely off track or did not submit
Sentence Structure & Style	* Word choice is rich and varies * Writing style is consistently strong * Students own formal language	* Word choice is clear and reasonably precise * Writing language is appropriate to the topic * Words convey intended message	* Word choice is basic * Most writing language is appropriate to the topic * Informal language	* Word choice is vague * Writing language is not appropriate to the topic * Message is unclear	* Not Adequate
Sources	Sources are cited and are used critically	Sources are cited and some are used critically	Some sources are missing	Sources are not cited	Sources are not at all cited
Neatness	Typed; Clean; Neatly bound in a report cover; illustrations provided	Legible writing, well-formed characters; Clean and neatly bound in a report cover	Legible writing, some ill-formed letters, print too small or too large; papers stapled together	Illegible writing; loose pages	Same as below standard
Timeliness	Report on time	Report one class period late	Report two class periods late	Report more than one week late	Report more than 10 days late

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT101			**Title**	**Batch:**	2026 - 2029
				CC I: Programming in 'C'	**Semester:**	I
Lecture Hrs./Week	4	**Tutorial Hrs./Sem.**	4		**Credits:**	4

Course Objective

To cultivate programming ability on logic development, clear view on control structures, pointers (memory management), file handling, etc.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To keep in mind the fundamentals of C programming.	PO1(3), PO2(2), PO3(2), PO4(2), PO5(1), PO8(2), PO9(1), PO10(2), PO11(2), PO15(2)
CO2	To understand the concepts of problem solving techniques.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(2), PO8(2), PO9(2), PO10(2), PO11(2), PO15(2)
CO3	To apply concepts and techniques for implementation.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO15(2)
CO4	To analyze the level of logical thinking in program development	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO5	To evaluate the program output.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(2), PO9(2), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	2	1	-	-	2	1	2	2	-	-	-	2
CO2	3	2	3	3	2	-	-	2	2	2	2	-	-	-	2
CO3	3	2	3	3	3	1	-	2	2	3	2	-	-	-	2
CO4	3	2	3	3	3	2	1	2	2	3	2	-	-	1	2
CO5	3	2	3	3	3	2	1	2	2	3	3	-	1	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs. L+T
Unit I	Programming development methodologies - Programming style – **Problem solving techniques:** Algorithm, Flowchart, Pseudo code. Structure of a C program – C character set - Delimiters – Keywords – Identifiers – Constants – Variables – Rules for defining variables – Data types – Declaring and initializing variables – Type conversion. Operators and Expressions.	13
Unit II	**Formatted and Unformatted I/O functions. Decision statements:** If, If...Else, Nested If. Else, Break, Continue, Go to, Switch, Nested switch...case, switch...case and nested ifs statements. **Loop control statements:** For, Nested for, While, Do...while and with while loops.	12+ 1
Unit III	**Arrays**: Initialization, definition, characteristics, One dimensional, predefined streams, two dimensional, three or multi-dimensional arrays – sscanf (), sprintf (). **String**s: Declaration and initialization, displaying, standard functions and applications. **Pointers:** Futures, Declarations, arithmetic operations, pointers and arrays, two dimensional arrays, array of pointers, pointers to pointers, pointers and strings, void pointers.	10+1
Unit IV	**Functions**: Definition, declaration, return statements, types, call by value and reference, returning more multiple values, function as an argument, function with arrays and pointers. **Structure and Union:** Features of structure, Declaration and initialization of structure, Structure within structure, Array of structure, Pointer to structure, structure and functions, typedef, Bit fields, Enumerated data types, Union, union of structures.	11+1
Unit V	**Files:** Streams and file types, Steps for file operation, File I/O, Structures read and write, Other file functions, searching errors in reading or writing files, low level disk I/O, Command line arguments, I/O redirection. **Preprocessor directives:** #define, #include, #ifndef, #error, #line, #pragma, and Predefined macros.	10+1
	Total Contact Hrs.	**60**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(GD/ Role Play /APS)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Balagurusamy. E	Programming in ANSI C	Tata McGraw-Hill	2008
2	PradipDey, ManasGhosh	Computer Fundamentals and Programming in C	Oxford	2008
3	Web Reference https://www.tutorialspoint.com/cprogramming/index.htm			

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Ashok .N. Kamthane	PROGRAMMING AND DATA STRUCTURES	Pearson Education	2009

Course Designed by	Mr. K. Vijayakumar	
Verified by HOD	Mr. K. Vijayakumar	POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,PhD. PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT102			Title	Batch:	2026 - 2029
				CC- II : Computer System Architecture	Semester:	I
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

To obtain the basic knowledge of computer organization, input, output and memory organization.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To remember basic building block of digital computer system	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO8(3), PO9(1), PO10(2), PO11(2), PO15(2)
CO2	To understand the execution sequence of instruction through the processor	PO1(3), PO3(3), PO4(3), PO5(2), PO6(1), PO8(2), PO9(2), PO10(2), PO11(2), PO15(2)
CO3	To apply interfacing of various peripheral devices used with the system	PO1(3), PO3(3), PO6(1), PO8(2), PO10(3), PO11(2), PO14(1)
CO4	To analyze functioning of various parts of the computer from hardware point of view	PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO5	To judge the pros and cons of various types of memory organizations	PO1(3), PO2(2), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PO 13	PO 14	PO 15
CO1	3	2	2	2	2	-	-	3	1	2	2	-	-	-	2
CO2	3	-	3	3	2	1	-	2	2	2	2	-	-	-	2
CO3	3	-	3	-	-	1	-	2	-	3	2	-	-	1	-
CO4	-	2	3	3	3	2	1	2	2	3	2	-	-	1	2
CO5	3	2	-	-	-	-	-	-	-	3	3	-	1	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**Binary Systems:** Numbers – Conversions – Complements – Codes – Logic. **Canonical & Standard Forms**. **Digital Logic Gates. Simplification of Boolean Functions:** Map method – Two & Three Variable Map – Four Variable Map.	**16**
Unit II	**Basic Computer Organization and Design:** Instruction Codes - Computer Registers – Computer Instructions – Instruction Cycle – Memory Reference Instructions – InputOutput and Interrupt.	**15**
Unit III	**Central Processing Unit (CPU):** General Register Organization – Stack Organization - Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control.	**15**
Unit IV	**Input – Output Organization:** Peripheral Devices- Input – Output Interface – Asynchronous Data Transfer - Direct Memory Access (DMA) - CPU-IOP Communication.	**14**
Unit V	**Memory Organization:** Memory Hierarchy – Main Memory - Auxiliary Memory - Cache Memory – Associative Memory - Virtual Memory.	**15**
	Total Contact Hrs.	**75**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class. Test, Seminar, Quiz, Assignments, Group Task.(Role Play)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	M. Morris Mano	Computer System Architecture	Pearson	2023

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	M. Carter	Computer Architecture. Schaum's outline series	TMH Pub	2001
2	William Stallings	Computer System and Architecture	Pearson Publication.	2006
3	**Web Reference** https://www.youtube.com/watch?v=aWp8ILQgudI https://www.youtube.com/watch?v=OwC4JN64QYY			

Course Designed by	Dr. C.R. Durga devi	C.R.Durga devi	
Verified by HOD	Mr. K. Vijayakumar		K.VIJAYAKUMAR, MCA., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian		Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title :**	Information Technology	
Course Code:	26UIT1A1			**Title:**	**Batch :**	2026 - 2029
				Allied : Mathematics – I (Vedic & Statistics)	**Semester :**	I
Lecture Hrs/Week:	4	**Tutorial Hrs./ Sem.**	5		**Credits :**	4

Course Objective

Learning various Vedic mathematical operations like addition, subtraction, multiplication, division, square, square root etc.. also statistical methods like central tendency, dispersion, and probability.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To remember the shortcut notations of addition, subtraction, multiplication, division, square, square root.	PO1(3), PO2(2), PO3(1), PO4(2), PO5(1), PO8(2), PO9(1), PO10(2), PO11(2), PO15(2)
CO2	To understand the concepts Central tendency, Range, Dispersion, and Probability.	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO8(3), PO9(2), PO10(2), PO11(2), PO15(2)
CO3	To solve the problems by using formula to apply the programs	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To analyze the solution is right or wrong	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(3), PO10(3), PO11(2), PO14(1), PO15(2)
CO5	To evaluate the results through the program outputs	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	2	1	-	-	2	1	2	2	-	-	-	2
CO2	3	2	2	2	2	-	-	3	2	2	2	-	-	-	2
CO3	3	2	3	3	3	1	-	2	2	3	2	-	-	1	2
CO4	3	2	3	3	3	1	-	2	3	3	2	-	-	1	2
CO5	3	2	3	3	3	2	1	3	3	3	3	-	1	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs. L+T
Unit I	**Addition:** Introduction, Vedic sutras for addition – Purna puranabhyam, Sankalan Vyavkalanabhyam and Ekadhikena Purvena. Meaning of Vedic Sutras and their applications. **Subtraction:** Introduction, Vedic Sutra for subtraction – Nikhilam Navatascaramam Dastatah and Vinculum. Meaning and application, Digit Separator Method for subtraction. **Multiplication:** Introduction, Vedic sutras:- Antyayor dasakepi, Nikhilam Navatascaramam Dastatah, Anurupyena, Ekanyuena Purvena , Antyayoshatakepi, Vamanlvavoh Dasake api, Vamanlyayoh Dasake Gunijah Api and Urdhva- Tiryak, their meanaings and applications.	12+1
Unit II	**Division:** Introduction, Vedic sutra- Nikhilam, Paravartya Yojayet, Urdhva Tiryag and Dhwajanka method – their meanings and applications. **Square**: Introduction, Vedic Method for squaring: Ekadhikena Purvena, Yavadunam Tavduni kritya Vargena Yojayet, Duplex method and Urdhva Tiryagbhyam, its meaning and applications. **Square Root**: Introduction, Vilokanam and Duplex Vedic Method of finding square root.	12+1
Unit III	**Measures of central tendency:** Mean: Arithmetic Mean, Weighted Arithmetic Mean, Combined Arithmetic Mean, Geometric Mean, Harmonic Mean, Median and mode – Relation between mean, median and mode.	11+1
Unit IV	**Dispersion:** Range - Mean deviation - Standard deviation - Coefficient of Variation – Quartile Deviation.	9+1
Unit V	**Probability:** Permutation and Combination- Important terms in probability- **Measurement of Probability:** Classical Approach- Relative Frequency theory of probability – Personalistic view of probability – Axiomatic Approach of probability. **Theorems of probability:** Addition – Multiplication – Odds.	11+1
	Total Contact Hrs.	**60**

Pedagogy and Assessment Methods:

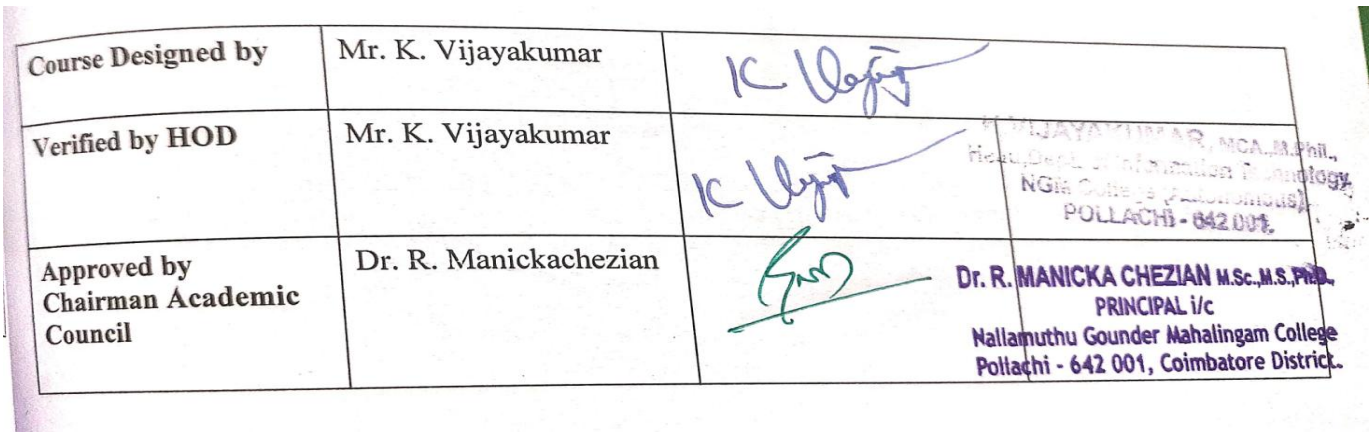
Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(GD/ Role Play /APS)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Rajesh Kumar Thakur	The essentials of Vedic Mathematics	Rupa Publications India Pvt. Ltd	2013
2.	Pillai R. S. N. Bagavathi V	Statistical Methods	Sultan Chand and Sons & Company Ltd	2019

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Gupta. S.C. Kapoor. V.K	Fundamentals of Mathematical Statistics	S. Chand and Sons	Reprint 2014
2	**Web Reference** https://www.rljdmcdavpselibrary.com/books/vedicmaths.pdf https://www.tutorialspoint.com/statistics/index.htm https://www.google.com/amp/s/www.edureka.co/blog/statistics-and-probability/amp/			



Course Designed by	Mr. K. Vijayakumar	
Verified by HOD	Mr. K. Vijayakumar	
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D. PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title :**	Information Technology	
Course Code:	26UIT1A2			**Title:**	**Batch :**	2026 - 2029
				Allied : Mathematics – I (Numerical Methods)	**Semester :**	I
Lecture Hrs/Week:	4	**Tutorial Hrs./ Sem.**	5		**Credits :**	4

Course Objective

To have an in-depth knowledge of various advanced methods in numerical analysis and to use numerical techniques to get numerical solutions of equations like transcendental and non-linear differential equations when ordinary analytical methods fail.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To remember numerical analysis techniques	PO1(3), PO2(2), PO3(1), PO4(2), PO5(1), PO8(2), PO9(1), PO10(2), PO11(2), PO15(2)
CO2	To understand the solution to problems of algebraic and transcendental equations, simultaneous linear equations.	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO8(3), PO9(2), PO10(2), PO11(2), PO15(2)
CO3	To solve the problems using Newton forward and backward interpolation	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To analyze the differential equations	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(3), PO10(3), PO11(2), PO14(1), PO15(2)
CO5	To evaluate the ordinary differential equations	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	2	1	–	–	2	1	2	2	–	–	–	2
CO2	3	2	2	2	2	–	–	3	2	2	2	–	–	–	2
CO3	3	2	3	3	3	1	–	2	2	3	2	–	–	1	2
CO4	3	2	3	3	3	1	–	2	3	3	2	–	–	1	2
CO5	3	2	3	3	3	2	1	3	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs. L+T
Unit I	**The solution of Numerical Algebraic and Transcendental Equations:** Introduction - The Bisection method - The iteration method - The method of false position (Regula - Falsi Method) - Newton Raphson method. **Simultaneous Linear Algebraic Equations:** Introduction – Gauss Elimination Method – Gauss Jordan Method – Computation of the inverse of a Matrix using Gauss's Elimination Method.	13+1
Unit II	**Simultaneous Linear Algebraic Equations:** Iterative Methods - Gauss-Jacobi Method – Gauss-Seidal Method – Comparison of Gauss elimination and Gauss-Seidal Iteration methods.	9+1
Unit III	**Interpolation:** Introduction - Linear interpolation - Gregory Newton Forward and Backward interpolation Formula - Equidistant terms with one or more missing values.	9+1
Unit IV	**Numerical Differentiation**: Introduction - Newton's forward difference formula to compute the derivatives - Newton's backward difference formula to compute the derivatives. **Numerical Integration:** The Trapezoidal rule - Simpson's one third rule – three fourth rule.	12+1
Unit V	**Numerical Solution of Ordinary Differential Equations:** Solution by Taylor Series - Taylor Series method for higher order differential equations- Euler's method - Improved Euler's method - Modified Euler method – Runge Kutta method - Second order Runge Kutta Method	12+1
	Total Contact Hrs.	**60**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(GD/ Role Play /APS)

Text Book:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Kandasamy P , Thilagavathy K and Gunavathi K	Numerical Methods	S. Chand company Ltd	2012

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Venkataraman M. K	Numerical Methods in Science and Engineering	National Publishing Company	2009
2	**Web Reference** https://nptel.ac.in/courses/111107105			

Course Designed by	Ms. V. Prabavathi	V. Prabavathi.	
Verified by HOD	Mr. K. Vijayakumar		AKUMAR, MCA.,M.Phil., of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian		Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B. Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT103			Title	Batch:	2026 - 2029
				CC Lab. - I Programming in 'C'	Semester:	I
Practical Hrs./Week:	4	Tutorial Hrs./Sem.	-		Credits:	2

Course Objective

To understand, learn and apply the various programming concepts of 'C' and applying the Vedic concepts and programming skills in 'C'**.**

Course Outcomes

CO Number	CO Statement	PO Mapping
CO1	To apply appropriate mathematical and scientific program logic	PO1(3), PO2(2), PO3(2), PO4(3), PO5(2), PO8(2), PO9(1), PO10(3), PO11(2), PO15(2)
CO2	To apply appropriate pointers, structure, and files	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO3	To apply appropriate data structure and Vedic arithmetic concepts	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(3), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To analyze a problem in different logic	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(3), PO10(3), PO11(2), PO14(1), PO15(2)
CO5	To verify the solutions of various problems with input and output data	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(2), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	3	2	–	–	2	1	3	2	–	–	–	2
CO2	3	2	3	3	3	1	–	2	2	3	2	–	–	1	2
CO3	3	2	3	3	3	1	–	3	2	3	2	–	–	1	2
CO4	3	2	3	3	3	1	–	2	3	3	2	–	–	1	2
CO5	3	2	3	3	3	2	1	2	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Content	Hrs.
SAMPLE PROGRAM LIST **Test I** 1. Execute a C program to implement basic operators. 2. Execute a C program to implement if, if-else, nested if. 3. Develop a C program to implement switch case. 4. Develop a C program to implement while loop. 5. Create a C program to implement do-while loop. 6. Develop a C program to implement for loop. 7. Create a C program to implement one dimensional array. 8. Execute a C program to implement multi-dimensional array. 9. Create a C program to implement strings. 10. Execute a C program to implement basic pointer operations. 11. Execute a C program to find subtraction of two numbers applying using Nikhilam Vedic sutra. 12. Execute a C program to find multiplication of two numbers applying Vedic sutra **Test II** 13. Execute a C program to find division of two numbers applying Vedic sutra 14. Develop a C program to implement array of pointers. 15. Create a C program to implement functions using call by value. 16. Execute a C program to implement functions using call by reference. 17. Create a C program to implement structure and array of structure. 18. Develop a C program to implement union. 19. Execute a file to perform read and write operations using file accessing modes. 20. Create a C program to implement preprocessor directives. 21. Execute a C program to find the square of two numbers applying Vedic sutra 22. Execute a C program to find the square root of a number applying Vedic sutra	60
Total Contact Hrs.	60

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group Discussion

Course Designed by	Mr. K. Vijayakumar	K. Vijay
Verified by HOD	Mr. K. Vijayakumar	K. Vijay K. VIJAYAKUMAR, MCA.,M.Phil., Head, Department of Computer Technology NGM College (Autonomous) POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D. PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT1S1			Title	Batch:	2026 - 2029
				SS Lab. - I : Web Designing	Semester:	I
Practical Hrs./Week	SS	Tutorial Hrs./Sem.	-		Credits:	2

Course Objective

To know the Basic Tags and programming concepts of HTML and CSS

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To develop webpage using various HTML & CSS tags	PO1(3), PO2(2), PO3(2), PO4(3), PO5(2), PO8(2), PO9(1), PO10(3), PO11(2), PO15(2)
CO2	To analyze various HTML & CSS formats for web pages	PO1(3), PO2(2), PO3(3), PO4(3), PO5(2), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO3	To assess to creating applications using HTML and CSS tags	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To verify the usage of HTML & CSS in applications	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(3), PO10(3), PO11(2), PO14(1), PO15(2)
CO5	To create applications using HTML & CSS Tags	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(2), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	3	2	–	–	2	1	3	2	–	–	–	2
CO2	3	2	3	3	2	1	–	2	2	3	2	–	–	1	2
CO3	3	2	3	3	3	1	–	2	2	3	2	–	–	1	2
CO4	3	2	3	3	3	1	–	2	3	3	2	–	–	1	2
CO5	3	2	3	3	3	2	1	2	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Content	Hrs.
SAMPLE PROGRAM LIST 1. Experiment with Webpage creation using basic tags. 2. Apply Ordered List and Un-Ordered List in web pages 3. Apply Table Tags in web pages 4. Experiment with Frame creation. 5. Apply Font Attributes in web pages 6. Apply HTML tags in Text formatting. 7. Apply HTML tags in Color for Background and Foreground. 8. Apply CSS tags in Text and Color formatting. 9. Apply CSS tags to create Webpage. 10. Apply Internal, Inline and External Style Sheets in Web page.	**SS**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group Task(GD)

Course Designed by	Mr. R.Sekar	
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil. Head, Dept. of Information Technology NGM College (Autonomous) POLLACHI - 642 001
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc.- IT			Programme Title:	Information Technology	
Course Code:	26UIT204			Title	Batch:	2026 - 2029
				CC - III: Object Oriented Programming with Java	Semester:	II
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

To provide knowledge about basic concepts of OOPs, methods, interfaces multithreads, packages and applets.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To keep in mind the basic concepts of OOPs	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO8(2), PO9(1), PO10(3), PO11(2), PO15(2)
CO2	To apprehend a knowledge about how to use java for internet applications	PO1(3), PO2(2), PO3(3), PO4(3), PO5(2), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO3	To implement file, applet, thread concepts for web applications	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To review the usage of packages, exceptions and string concept for developing stand - alone java programs	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(2), PO9(3), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To assess the various types of stream classes and file handling	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	2	2	–	–	2	1	3	2	–	–	–	2
CO2	3	2	3	3	2	1	–	2	2	3	2	–	–	1	2
CO3	3	2	3	3	3	1	–	2	2	3	2	–	–	1	2
CO4	3	2	3	3	3	2	1	2	3	3	2	–	1	1	2
CO5	3	2	3	3	3	2	1	3	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**Fundamentals of Object Oriented Programming**: Introduction – Paradigm - Basics – Benefits – Applications. **Java Evolution**: History – Features – Difference from C/C++ – Web browsers – Hardware and software requirements – Support systems –Environment. **Overview of Java language - Constants, Variables and Data types**.	12
Unit II	**Classes, Objects and Methods:** Introduction – Defining – Field, Method Declaration – Creating Objects – Accessing class members – Constructors – Method Overloading - Static Members – Nesting of Methods – Inheritance – Overriding – Final Variables, Methods and Classes. Finalizer Methods – Abstract methods and classes – Methods with Varargs – Visibility control. **Arrays, Strings and Vectors:** Introduction – One dimensional – Creation – Two-dimensional – Strings - Vectors – Wrapper classes – Enumerated types – Annotations.	13
Unit III	**Interfaces:** Multiple Inheritance – Introduction – Defining – Extending - Implementing Interface – Accessing Interface Variables. **Packages: Putting classes together**: Introduction – API packages – System packages – Naming Conventions – Creation – Accessing – Using – Adding a Class to a package – Hiding classes – Static import.	12
Unit IV	**Multithreaded Programming** : Introduction – Creation – Extending – Stopping and blocking – Life cycle – Using thread methods – Exceptions – Priorities – Synchronization – Implementing the Runnable interface – Inter-thread communication. **Managing Errors and Exceptions –** Introduction – Types of Errors- Exceptions – Syntax of Exception Handling- Multiple catch statements- Using Finally statement-Throwing our own Exceptions-Improved Exception Handling-Using Exceptions for Debugging	12
Unit V	**Managing Input / Output Files:** Introduction – Streams – Stream Classes – Byte Stream – Character Stream – Using Stream – Useful I/O Classes – File Classes – I/O Exceptions – File Creation – Reading Writing Characters and Bytes – Primitive Data Types – Concatenating and Buffering - Random Access File – Interactive I/O – Other Stream Classes.	11
	Total Contact Hrs.	**60**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(GD)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	E. Balagurusamy	Programming with JAVA – A Primer	Tata McGraw-Hill Publishing Company Limited, 6th Edition.	2019

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Herbert Schild	Java Complete Reference	Tata McGraw Hill Pub	2002
2	Y. Daniel Liang	Intro to Java Programming (Comprehensive Version)	10th Edition Pearson Publication	2018
3	**Web Reference** https://youtu.be/uWYPVz_i7W4 https://youtu.be/7s3xDfdqfDw			

Course Designed by	Dr. C.R. Durga devi	C.R.Durga devi
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B. Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT205			**Title**	**Batch:**	2026 - 2029
				CC- IV: Data Structures	**Semester:**	II
Lecture Hrs/Week:	5	**Tutorial Hrs./ Sem.**	-		**Credits:**	4

Course Objective

To have adequate knowledge about linear data structures, queues, linked list, trees, searching, sorting and hashing.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To recollect basic concepts of data handle.	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO8(2), PO9(1), PO10(3), PO11(2), PO15(2)
CO2	To comprehend data structures like stack, queue, linked list and trees..	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO3	To implement data structure techniques in problem solving	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To analyze space and time complexity of algorithms and to evaluate various data structures.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)
CO5	To evaluate different algorithm results through the program outputs	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	2	2	–	–	2	1	3	2	–	–	–	2
CO2	3	2	3	3	3	1	–	2	2	3	2	–	–	1	2
CO3	3	2	3	3	3	1	–	2	2	3	2	–	–	1	2
CO4	3	2	3	3	3	2	1	3	3	3	3	–	1	1	3
CO5	3	2	3	3	3	2	1	3	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**Arrays:** Introduction to Linear and Non Linear Data Structures - Arrays in C – Single Dimensional Arrays - Array Operations. **Linked List:** Introduction to List and Linked Lists - Dynamic Memory Allocation - Basic Linked List Operations-Doubly Linked List - Circular Linked List - Atomic Node Linked List - Linked List in Arrays - Linked List versus Arrays.	16
Unit II	**Stacks:** Introduction to Stacks - Stack as an Abstract Data Type - Representation of Stacks Through Arrays - Representation of Stacks Through Linked List - Applications of Stacks - Stacks and Recursion.	14
Unit III	**Queues:** Introduction - Queue as an Abstract Data Type - Representation of Queues - Circular Queues - Double Ended Queues - Dequeue - Priority Queues - Application of Queues.	14
Unit IV	**Binary Trees:** Introduction to nonlinear Data Structure - Introduction to Binary Trees - Types of Trees - Definitions - Properties - Representation - Operations – Traversal - Reconstruction - Counting Number - Applications. **Searching**: An Introduction - Binary Search-Indexed Sequential search.	16
Unit V	**Graph:** Traversal – Spanning trees. **Sorting**: Sorting - An Introduction - Efficiency of sorting Algorithms - Bubble sort - Selection sort - Quick sort - Insertion sort - Merge sort - Binary Tree Sort - Radix sort - Shell sort – Heap sort. **Hashing:** An Introduction - Hash functions.	15
	Total Contact Hrs.	75

Pedagogy and Assessment Methods:

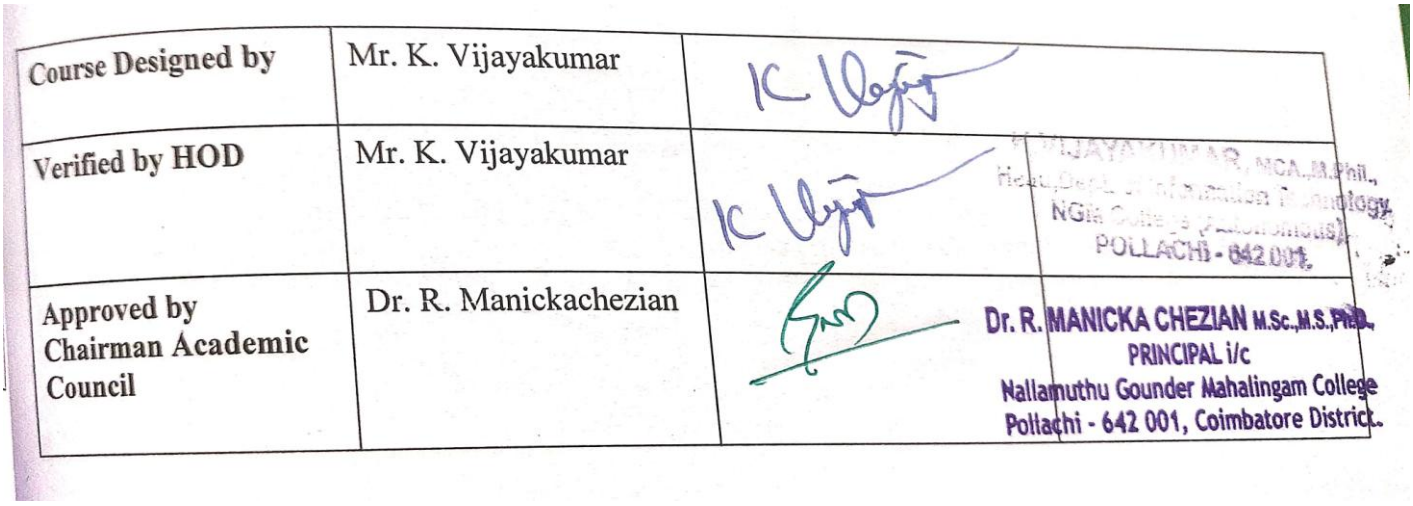
Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(GD/ Role Play /APS)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	ISRD group	Data structure using C	Seventh Reprint. Tata McGraw-Hill.	2010

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Aaron .M. Tanenbaum, Yedidyeh Langsam, Moshe .J. Augenstein	Data Structure using C	3rd Edition.PHI Pub	2007
2	Ashok. N. Kamthane	Programming And Data Structures	First Indian Print. Pearson Education	2004
3	**Web Reference** https://www.tutorialspoint.com/data_structures_algorithms/index.htm https://www.javatpoint.com/data-structure-tutorial			



Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT2A1			**Title**	**Batch:**	2026 – 2029
				Allied : Mathematics II (Discrete Mathematics)	**Semester:**	II
Lecture Hrs./Week	4	**Tutorial Hrs./Sem.**	10		**Credits:**	4

Course Objective

On successful completion of this subject the students should know Set theory, Mathematical logic, Relations, Graph theory, Languages and Grammars

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To remember the basic concepts of set theory, mathematical logic, relations graph theory and Language grammar.	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO8(3), PO9(1), PO10(2), PO11(2), PO15(2)
CO2	To infer the basic terminology of discrete mathematics	PO1(3), PO2(2), PO3(3), PO4(2), PO5(2), PO8(3), PO9(2), PO10(2), PO11(2), PO15(2)
CO3	To construct discrete notations in the programs	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To analyze discrete concepts through programs	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To determine languages and grammars for programming	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	2	2	–	–	3	1	2	2	–	–	–	2
CO2	3	2	3	2	2	–	–	3	2	2	2	–	–	–	2
CO3	3	2	3	3	3	1	–	2	2	3	2	–	–	1	2
CO4	3	2	3	3	3	2	1	3	3	3	2	–	1	1	2
CO5	3	2	3	3	3	2	1	3	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs. L+T
Unit I	**Set Theory**: Introduction-Set & its Elements-Set Description-Types of sets-Venn-Euler Diagrams - Set operations & Laws of set theory - Fundamental products - partitions of sets - min sets - Algebra of sets and Duality – Inclusion and Exclusion principle	**10+2**
Unit II	**Mathematical Logic**: Introduction - Propositional Logic –Introduction, Proofs –Basic logical operations – Tautologies – Contradiction - Predicate calculus.	**10+2**
Unit III	**Relations**: Binary Relations – Set operation on relations -Types of Relations – Partial order relation – Equivalence relation – Composition of relations. **Functions:** Types of functions – Invertible functions – Composition of functions.	**10+2**
Unit IV	**Graph Theory**: Basic terminology – paths, cycle & Connectivity – Sub graphs – Types of graphs – Isomorphic graphs – Homeomorphic Graphs - Representation of graphs in computer memory – Eulerian and Hamiltonian Graphs – Shortest Path Problems - Planar Graph.	**10+2**
Unit V	**Number Theory:** Introduction – properties of integer – Greatest Common Divisor – Euclidean algorithm – Least Common Multiple – testing for Prime number. **Language and Grammar:** Introduction –The set theory of strings – Languages – Regular expressions and Regular languages – Grammar – Finite state machine.	**10+2**
	Total Contact Hrs.	**60**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Assignments

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Sharma. J.K	Discrete Mathematics	2nd Edition. Macmillan India Ltd	2005

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Kenneth H. Rosen	Discrete Mathematics and Its Applications	5th Edition, McGraw Hill Pub.	2003
2	Dr. Venkataraman. M. K. Dr. Sridharan. N, Chandarasekaran. N	Discrete Mathematics	The National publishing Company	2000
3	**Web Reference** https://www.youtube.com/watch?v=itrXYg41-V0 https://www.youtube.com/watch?v=tyDKR4FG3Yw https://www.youtube.com/watch?v=HmQR8Xy9DeM https://www.youtube.com/watch?v=19SW3P_PRHQ			

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi
Verified by HOD	Mr. K. Vijayakumar	K.V. JAYAKUMAR, MCA., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT2A2			**Title**	**Batch:**	2026 – 2029
				Allied : Mathematics – II (Operations Research)	**Semester:**	II
Lecture Hrs./Week	4	**Tutorial Hrs./Sem.**	10		**Credits:**	4

Course Objective

To enable the students to understand and to apply the resource management techniques available in OR including linear programming transportation assignment problem, inventory control, queuing theory and network problems.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To remember the concepts of linear programming methods	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO8(3), PO9(1), PO10(2), PO11(2), PO15(2)
CO2	To understand the concepts of transportation, networking, replacement.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(2), PO6(1), PO8(3), PO9(2), PO10(2), PO11(2), PO15(2)
CO3	To solve the problems optimization techniques to solve the computer based business problems	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(3), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To analyze the ability of critical thinking, to find shortest time duration	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To evaluate the Economic order quantity	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	2	2	–	–	3	1	2	2	–	–	–	2
CO2	3	2	3	3	2	1	–	3	2	2	2	–	–	–	2
CO3	3	2	3	3	3	1	–	3	2	3	2	–	–	1	2
CO4	3	2	3	3	3	2	1	3	3	3	2	–	1	1	2
CO5	3	2	3	3	3	2	1	3	3	3	3				

3 Point Scale – 1, 2, 3

Units	Content	Hrs. L+T
Unit I	Origin and development of OR – Applications of OR – Linear programming problem – Mathematical formulation of the problem – Graphical Method – Simplex Method – Big-M Method -Two Phase Simplex Method	**10+2**
Unit II	**Transportation Problem:** Balanced Transportation problem and Un-Balanced Transportation problem-Row Minimum-Column Minimum-North-West Corner Matrix Minima Method-Vogel's Approximation Methods-MODI Method (U-V Method for OBFS). **Assignment Problem:** Balanced and Un-Balanced Assignment problem– Hungarian method – Routing problem	**10+2**
Unit III	**Network Scheduling:** Network and Basic components – Logical sequencing: Formation of a loop, Dangling, Redundancy-Network Construction- Rules of Network construction – Time calculation in Network-Numbering the events– Critical Path Method (CPM)– PERT: PERT Tabulation and Calculations.	**10+2**
Unit IV	**Replacement Problem and System Reliability:** Model 1: Value of Money does not change with time. Model 2: Value of Money change with time. **Game and Strategies:** Introduction-Two-Person Zero-Sum games-Pure Strategies: Maximin-Minimax Principles-Saddle Point and Value of the Game-Rule for determining a Saddle Point- Mixed Strategies: Games without Saddle Points- 2x2 Rectangular Games.	**10+2**
Unit V	**Sequencing problem:** Problems with n jobs and 2 machines – Problems with 'n' jobs and 'k' machines. **Inventory control** – Types of inventory-Economic Order Quantity: Model 1: EOQ problem with no shortages Model 2: EOQ problem with no shortages and several production runs of unequal length Model 3: EOQ problem with shortages. **EOQ Problem with Price Breaks:** Model 1: EOQ Problem with one price breaks.	**10+2**
	Total Contact Hrs.	**60**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Assignments

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	KantiSwarup, PK Gupta, Man Mohan	Operations Research	Sultan Chand and Sons & Company Ltd.	2020

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	S. Dharani Venkatakrishnan	Operations Research	Keerthi Publishing P.Ltd	2015
2	G. Srinivasan	Operations Research: principles and Applications	2nd Edition	2017
3	**Web Reference** https://rb.gy/6m3df https://rb.gy/mq3k4			

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi.
Verified by HOD	Mr. K. Vijayakumar	K.V.JAYAKUMAR, MCA.,M.Phil., Head, Dept. of Information Technology NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT206			**Title**	**Batch:**	2026 - 2029
				CC Lab.-II: Programming in Java with Data Structures	**Semester:**	II
Practical Hrs./Week	4	**Tutorial Hrs./Sem.**	-		**Credits:**	2

Course Objective

To apply various concepts of java like inheritance, multithreading, exception handling, package for improving the programming skills in Java.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To apply basic object oriented programming concepts in Java	PO1(3), PO2(2), PO3(2), PO4(3), PO5(2), PO8(2), PO9(1), PO10(3), PO11(2), PO15(2)
CO2	To analyze the usage of packages in program development	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO3	To prove the need of exceptions and data structures	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(3), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To verify the usage of multithreads	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(2), PO9(3), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To create files using different streams	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	3	2	–	–	2	1	3	2	–	–	–	2
CO2	3	2	3	3	3	1	–	2	2	3	2	–	–	1	2
CO3	3	2	3	3	3	1	–	3	2	3	2	–	–	1	2
CO4	3	2	3	3	3	2	1	2	3	3	2	–	1	1	2
CO5	3	2	3	3	3	2	1	3	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Content	Hrs.
SAMPLE PROGRAM LIST **Test I** 1. Develop a class using constructor. 2. Develop a Program using method overloading. 3. Develop a Program using method overriding. 4. Apply single and multi-dimensional array in assessing students performance 5. Apply multiple inheritance using interfaces. 6. Develop a Program using packages and sub packages. 7. Create a class to implement the data structure STACK. Write a constructor to initialize the TOP of the stack to 0. Write a member function POP ( ) to delete an element. Check for overflow and underflow conditions. 8. . Create a class MAT has a 2-d matrix and R&C represents the rows and columns of the matrix. Overload the operators +,-,* to add subtract and multiply two matrices. Write member functions to get and display MAT object values. 10. Create a class STRING. Write member function to initialize, get and display strings. Overload the operator + to concatenate two strings, = = to compare two strings and a member function to find the length of the string. 11. Create a class which consists of EMPLOYEE detail like eno, ename, dept, basic-salary, and grade. Write member functions to get and display them. Derive a class PAY from the above class and write a member function to calculate da, hra, pf depending on the grade and Display the Payslip in a neat format using console I/O. **Test II** 12. Develop a Program using threads. 13. Test for inter-thread communication in program 14. Test for Exception Handling in program 15. Develop a Program to generate files. 16. Create a class SHAPE which consist of two VIRTUAL FUNCTIONS Cal_Area( ) and Cal_PERI to calculate AREA and PERIMETER of various figures. Derive three Classes SQUARE, RECTANGLE and TRIANGLE from the class SHAPE and calculate AREA and PERIMETER of each class separately and Display the result. 17. Create two classes which consist of two private variables, one float and one integer variables in each class. Write member functions to get and display them. Write FRIEND function common to arguments And the integer and float values of both the objects separately and Display the result. 18.. Write a user defined function USERFUN ( ) which has the formatting commands like setw( ) , showpoint , showpos precision ( ). Write a program which prints a multiplication table and uses USERFUN( ) for formatting. 19. Write a program to perform Insertion, Deletion and Updation using files. 20. Write a program which takes a file as argument and copies in to another file with line numbers	**60**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group task (Group Discussion)

Course Designed by	Dr. C.R. Durga devi	C.R. Durga devi
Verified by HOD	Mr. K. Vijayakumar	K. VIJAYAKUMAR, MCA., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT2S1			Title	Batch:	2026 - 2029
					Semester:	II
Practical Hrs./Week	2	Tutorial Hrs./Sem.	--	SEC - I :Naan Mudhalvan : Web Designing	Credits:	1

Course Objective

To known the various scripting programming concepts of HTML tags, Style sheets and JavaScript and Basics of React components.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To motivate the students to create dynamic website	PO1(3), PO2(2), PO3(2), PO4(3), PO5(2), PO8(2), PO9(1), PO10(3), PO11(2), PO15(2)
CO2	To create website using javascript.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO3	To construct forms and validate user input in javascript	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(3), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To develop javascript programs in client side scripting	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(2), PO9(3), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To Understand the React components fundamentals.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	3	2	–	–	2	1	3	2	–	–	–	2
CO2	3	2	3	3	3	1	–	2	2	3	2	–	–	1	2
CO3	3	2	3	3	3	1	–	3	2	3	2	–	–	1	2
CO4	3	2	3	3	3	2	1	2	3	3	2	–	1	1	2
CO5	3	2	3	3	3	2	1	3	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Content	Hrs.
SAMPLE PROGRAM LIST **JavaScript** 1. Program to Display Digital clock. 2. onClick and onChange Event. 3. onFocus Event and & onMouseOver and onMouseOut example 4. Displaying Date and Time. 5. create Element and createTextNode example. 6. Redirection using location object. 7. Hello component +JSX 8. Props example 9. Counter app. 10. List rendering **React** 1. create simple components and render them using JSX syntax 2. Use props to pass data to child components 3. Fetch data from APIs and update state using effects.	30
Total Contact Hrs.	30

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group Discussion

Course Designed by	Ms. V. Prabavathi	V. Prabavathi.
Verified by HOD	Mr. K. Vijayakumar	YAKUMAR, MCA.,M.Phil., of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title :	Information Technology	
Course Code:	26UIT307			Title:	Batch :	2026 - 2029
				CC -V: Operating Systems	Semester :	III
Lecture Hrs/Week:	4	Tutorial Hrs./Sem.	-		Credits :	4

Course Objective

On successful completion of this subject the students should know the basic concepts of operating system, memory management, process management, information management, deadlocks, parallel processing, distributed processing and Windows and Mobile operating system.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To recollect fundamentals of operating system concepts.	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO8(2), PO9(1), PO10(2), PO11(2), PO15(2)
CO2	To understand basic principles and advanced concepts of the operating system.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(2), PO6(1) PO8(3), PO9(2), PO10(2), PO11(2), PO15(2)
CO3	To apply the different mathematical foundations, algorithmic principles with approaches in computer based systems.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(1) PO8(3), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To analyze the various architectural components involved in OS and its applications.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2) PO7(1), PO8(3), PO9(3), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To evaluate different Windows & Mobile operating system configurations.	PO1(3), PO2(2), PO3(2), PO4(3), PO5(3), PO6(2) PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	2	2	–	–	2	1	2	2	–	–	–	2
CO2	3	2	3	3	2	1	–	3	2	2	2	–	–	–	2
CO3	3	3	3	3	3	1	–	3	2	3	2	–	–	1	2
CO4	3	3	3	3	3	2	1	3	3	3	2	–	1	1	2
CO5	3	2	2	3	3	2	1	3	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**Operating System-Functions and Structure:** Operating System Definition- Different services of Operating System- Uses of System Calls- Issue of Portability-Operating System Structure- Virtual machine- Booting. **Information Management:** Introduction - The File System- Introduction - Block and Block numbering scheme - Relationship between OS and DMS - File Directory entry - Open/Close Operations. **Device Driver (DD):** The Basics, I/O Procedure, I/O Scheduler.	13
Unit II	**Process Management:** Introduction – States – Transitions – Operations on a Process – Process Scheduling – Multithreading. **Inter Process Communication** -The Producer Consumer Problem. **Solutions to the Producer Consumer problems:** Interrupt Disabling/Enabling - Lock-flag – Primitive for mutual exclusion - Alternating Policy – Semaphores - Classical IPC Problems.	11
Unit III	**Deadlocks:** Introduction - Graphical Representation of Deadlock - Deadlock Prerequisites - Deadlock Strategies. **Memory Management**: Introduction - Single Contiguous Memory Management - Fixed Partition Memory Management - Variable Partitions - Non Contiguous Allocation General Concepts: Paging, Segmentation. **Virtual Memory Management System:** Jargon – Page Replacement Policies.	12
Unit IV	**Parallel Processing:** Introduction - Difference between Distributed and Parallel Processing - Advantages of Parallel Processing - Machine Architectures supporting Parallel Processing - Operating System for Parallel Processing. **Distributed Processing**: Introduction - Distributed Processing - Process Migration – RPC - Distributed Processes - Distributed File Management - Cache Management.	12
Unit V	**Windows Operating System:** Introduction - Version and Edition – Architecture. **Mobile Operating Systems :** Introduction – Objectives - Basic Functions - Architecture - Knowing the Mobile Phone OS - Discontinued Mobile Oss - Existing Mobile OSs – Types.	12
	Total Contact Hrs.	60

Pedagogy and Assessment Methods:

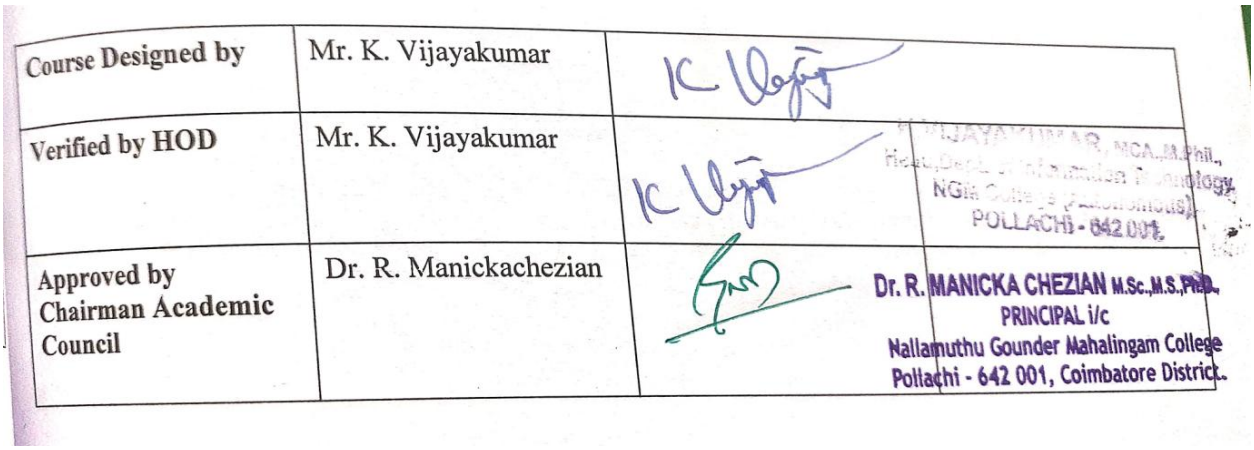
Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(GD/ Role Play /APS)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Achyut S Godbole	Operating Systems	2nd Edition, TMH Publications	2005

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	H. M Deitel	Operating Systems	2nd Edition, Pearson Education Publication	2003
2	Abraham Silberschatz, Peter B. Galvin, Greg Gagne	Operating System Concepts	10th edition, Abridged Print Companion	2018
3	**Web Reference** https://drive.google.com/file/d/1j30cmM3OcjXl2jfIyN652xpKmJTF2-0/view?usp=drive_link https://www.os-book.com/OSE1/slide-dir/PDF-dir/ch16.pdf http://cc.ee.ntu.edu.tw/~farn/courses/OS/slides/ch25.pdf			



Course Designed by	Mr. K. Vijayakumar	
Verified by HOD	Mr. K. Vijayakumar	
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D. PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT308			Title	Batch:	2026 - 2029
				CC- VI : Relational Database Management System	Semester:	III
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

To provide better understanding of various concepts of DBMS, Oracle, Normalization, Data Management and retrieval, PL/SQL Commands, Operations and Security.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To keep in mind the basic concepts of database	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO8(2), PO9(1), PO10(2), PO11(2), PO15(2)
CO2	To get the idea of a database from SQL statements	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(3), PO9(2), PO10(2), PO11(2), PO15(2)
CO3	To execute different forms of queries using SQL and PL/SQL statements	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(1), PO8(3), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To analyze various data models which describe the structure of database	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To interpret PL/SQL commands in programming	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	2	2	–	–	2	1	2	2	–	–	–	2
CO2	3	2	3	3	3	1	–	3	2	2	2	–	–	–	2
CO3	3	3	3	3	3	1	–	3	2	3	2	–	–	1	2
CO4	3	3	3	3	3	2	1	3	3	3	2	–	1	1	2
CO5	3	2	3	3	3	2	1	3	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**Database Concepts: A Relational approach:** Database – Relationships – DBMS– Relational Data Model – Integrity Rules – Theoretical Relational Languages. **Database Design: Data Modeling and Normalization**: Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams - Demoralization – Another Example of Normalization. **DFD:** Definition – example – Rules- Decomposition.	12
Unit II	**Oracle9i: Overview:** Introduction. **SQL *Plus:** Environment – SQL – Commands – Errors & Help – Alternate Text Editors - Worksheet - **i**SQL *Plus. **Oracle Tables:** DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.	12
Unit III	**Working with Table:** DML – adding a new Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – retrieving Data from Table – Arithmetic Operations – restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure. **Functions and Grouping**: Built-in functions – Grouping Data.	12
Unit IV	**Multiple Tables: Joins and Set operations**: Join – Set operators. **Sub queries:** Sub query - Correlated Sub query. **PL/SQL:** Introduction – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. **Control Structures and Embedded SQL**: Control Structures – Nested Blocks – SQ L in PL/SQL – Data Manipulation – Transaction Control statements.	12
Unit V	**PL/SQL Cursors and Exceptions:** Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions. **PL/SQL: Composite Data Types:** Records – Tables – V arrays. **Named Blocks**: Procedures – Functions – Packages –Triggers –Data Dictionary Views.	12
	Total Contact Hrs.	**60**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(GD)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Nilesh Shah	Database Systems Using Oracle	2nd edition, PHI	2009

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Ivan Bayross	SQL, PL/SQL the programming Language of ORACLE	4th Edition, BPB Publications	2017
2	ArunMajumdar & Pritimoy Bhattacharya	Database Management Systems	TMH	2001
3	Jeffrey A. Hoffer, Joey F. George, Joseph S. Valacich	Modern Systems Analysis and Design	2nd Edition. 5th Edition. Pearson Education Pub's	2009
4	Gerald V. Post	Database Management Systems	3rd Edition, TMH	2005
5	**Web Reference** https://intellipaat.com/blog/tutorial/sql-tutorial/rdbms/ https://www.youtube.com/watch?v=J5wjlf4gdq4 https://www.youtube.com/watch?v=DEwgEFHHn0M			

Course Designed by	Mr. R.Sekar	
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head,Dept. of Information Technology NGM College (Autonomous) POLLACHI - 642 001
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT3A1			**Title**	**Batch:**	2026 – 2029
				Allied : Microprocessor	**Semester:**	III
Lecture Hrs./Week	4	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

Understand the evolution of microprocessor, Addressing modes, pin diagrams of various processors, Other Microprocessors, Advanced Microprocessor, Mobile Processors, Interfacing A/D converter and Applications.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To Recall in mind the various microprocessor and microcontrollers manufacturer name, year, versions, bit-size, etc	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO8(2), PO9(1), PO10(2), PO11(2), PO15(2)
CO2	To Understand the basic concepts of 16 bit and 32 bit microprocessors.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(2), PO6(1), PO8(3), PO9(2), PO10(2), PO11(2), PO15(2)
CO3	To apply the instructions in the Assembly Language Programs.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(1), PO8(3), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To analyze the various products of processors and controllers.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To Conclude the various products of processors and controllers.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	2	2	–	–	2	1	2	2	–	–	–	2
CO2	3	2	3	3	2	1	–	3	2	2	2	–	–	–	2
CO3	3	3	3	3	3	1	–	3	2	3	2	–	–	1	2
CO4	3	3	3	3	3	2	1	3	3	3	2	–	1	1	2
CO5	3	2	3	3	3	2	1	3	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**Introduction to Microprocessors**: Evolution of microprocessors – Single- chip Microcomputer – Embedded Microprocessors – Bit - Slice processors – Microprogramming – RISC and CISC Processors – Scalar and Superscalar Processors – Vector Processors – Array Processors – Symbolic Processors – Digital Signal Processors Intel 8086 – Pin Description of Intel 8086 – Operating modes of 8086 – Register organization of 8086 – BIU and EU – Interrupts – 8086 based computer system – Addressing Modes of 8086.	13
Unit II	8**086 Instruction Set** – Instruction Groups – Addressing Mode Byte – Segment Register Selection – Segment Override – 8086 Instructions. **Intel 386 and 486 Microprocessors**: Intel 386 and 486 Microprocessor – 486DX Architecture – Register Organization of 486 Microprocessor – Memory Organization .	12
Unit III	. **Intel 386 and 486 Microprocessors**: Operating Modes of Intel 486 – Virtual Memory – Memory Management Unit – Gates – Interrupts and Exceptions – Addressing Modes of 80486 – Pin Configuration - Input devices – Output devices.	11
Unit IV	**Other Microprocessors:** Pentium – Pentium Pro – PentiumII**,** III, IV - Alpha – Cyrix – MIPS – AMD Processors. **Advanced Core Processors:** Dual Core - Core2 Duo - i3 - i5 - i7 – i9 - Quad – Octa - Penta – Comparision.	13
Unit V	**Mobile Processors:** Introduction – Models – Architecture. **Interfacing of A/D Converter and Applications**: Introduction – Interfacing of ADC 0808 or ADC 0809 to Intel 8086 – Bipolar to Unipolar Converter – Sample and Hold Circuit, LF 398 – Microprocessor-based Measurement and Control of Physical Quantities	11
	Total Contact Hrs.	**60**

Pedagogy and Assessment Methods:

Digital Presentation, Chalk and talk, Flipped class, Seminar, Quiz, Assignment, Group task.

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Badri Ram	Advanced Microprocessors and Interfacing	Tata McGraw-Hill Publishing. Company Limited	2007

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	A.K. Ray, K.M. Bhurchandi	Advanced Microprocessors and Peripherals	Tata McGraw-Hill Publishing Company Limited, 2nd Edition	2007
2	Ramesh S. Gaonkar	Microprocessor Architecture, Programming, and Applications with the 8085	3rd Edition. PRI India	1997
3	**Web Reference** https://www.geeksforgeeks.org/introduction-of-microprocessor https://www.slideshare.net/shehrevard/advanced-microprocessor https://www.tutorialspoint.com/microprocessor/microprocessor_io_interfacing_overview.htm#:~:text=The%20interfacing%20process%20includes%20some,the%20signals%20of%20the%20microprocessor https://en.wikipedia.org/wiki/List_of_Intel_Core_i9_microprocessors https://images-eu.ssl-images-amazon.com/images/I/C1Ip5bIG39S.pdf https://www.intel.com/content/dam/www/public/us/en/documents/datasheets/8th-gen-core-family-datasheet-vol-1.pdf https://timestech.in/all-about-mobile-phone-processors			

Course Designed by	Mr. R.Sekar	
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT3A2			**Title**	**Batch:**	2026 – 2029
				Allied : Electronic Devices and Circuits	**Semester:**	III
Lecture Hrs./Week	4	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

To develop basic knowledge in Electronic Components & impart knowledge on solving circuits**.**

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To keep in mind the fundamentals of Electronic devices and Circuits.	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO8(2), PO9(1), PO10(2), PO11(2), PO15(2)
CO2	To understand the concepts of components in Circuits.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(2), PO6(1), PO8(3), PO9(2), PO10(2), PO11(2), PO15(2)
CO3	To apply concepts of Devices for implementation in circuits.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(1), PO8(3), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To analyze the level of thinking in Electronic Circuits.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To evaluate the Circuit Design using Components.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	2	2	–	–	2	1	2	2	–	–	–	2
CO2	3	2	3	3	2	1	–	3	2	2	2	–	–	–	2
CO3	3	3	3	3	3	1	–	3	2	3	2	–	–	1	2
CO4	3	3	3	3	3	2	1	3	3	3	2	–	1	1	2
CO5	3	2	3	3	3	2	1	3	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**Foundations:** Introduction -Voltage, current, and resistance.- Signals- Capacitors and ac circuits- Inductors and transformers- Diodes and diode circuits- Other passive components	11
Unit II	**Bipolar Transistors: B**asic transistor circuits- Amplifier building blocks- Typical transistor circuits- Field-Effect Transistors- FET linear circuits- Power MOSFETs- MOSFETs in linear applications	13
Unit III	**Operational Amplifiers:** Introduction- Basic op-amp circuits- selected op-amp circuits- Op-amp operation with a single power-supply-typical op-amp circuits- Feedback amplifier frequency compensation	12
Unit IV	**Filters:** Introduction- Passive filters- Active-filter circuits. **Oscillators and Timers:** Oscillators- Timers. **Low-Noise Techniques:** Noise- Signal-to-noise ratio and noise figure- Bipolar transistor amplifier noise.	12
Unit V	**Digital Logic:** Basic logic concepts- Digital integrated circuits: CMOS and Bipolar (TTL)- Combinational logic- Sequential logic- Sequential functions available as integrated Circuits- typical digital circuits.	12
	Total Contact Hrs.	**60**

Pedagogy and Assessment Methods:

Digital Presentation, Chalk and talk, Flipped class, Seminar, Quiz, Assignment, Group task.

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Paul Horowitz, Winfield Hill	The Art Of Electronics	Third Edition, Cambridge University Press	2015

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	V.K.Mehta	Principles of Electronics	S. Chand &Co, New Delhi, 2nd edition	2008
2	Albert Malvino, David J. Bates	Electronic Principles	Seventh Edition, McGraw-Hill	2006
3	Bernard Grob	Basic Electronics	9th edition, Tata McGraw – Hill	2003
4	**Web Reference** https://jlcpcb.com/blog/basics-of-electronic-devices-and-circuits https://www.tutorialspoint.com/electronic_circuits/index.htm https://www.vedantu.com/jee-main/physics-electronic-devices			

Course Designed by	Mr. R.Sekar	
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head,Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT309			**Title**	**Batch:**	2026 - 2029
				CC Lab.- III : RDBMS	**Semester:**	III
Practical Hrs./Week	4	**Tutorial Hrs./Sem.**	-		**Credits:**	2

Course Objective

To understand, learn and apply the various programming concepts in RDBMS (Basic commands, Trigger, Functions, etc.)

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To apply appropriate queries in SQL	PO1(3), PO2(2), PO3(2), PO4(3), PO5(3), PO8(2), PO9(1), PO10(3), PO11(2), PO15(2)
CO2	To apply various commands in SQL and PL/SQL and tags and concepts in the application.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO3	To analyze various database applications.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(1), PO8(3), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To verify different forms of queries using SQL and PL/SQL statements	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To create various data models which describe the structure of database	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	3	3	–	–	2	1	3	2	–	–	–	2
CO2	3	2	3	3	3	1	–	2	2	3	2	–	–	1	2
CO3	3	3	3	3	3	1	–	3	2	3	2	–	–	1	2
CO4	3	3	3	3	3	2	1	3	3	3	2	–	1	1	2
CO5	3	2	3	3	3	2	1	3	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Content	Hrs.
SAMPLE PROGRAM LIST **Test I** 1. Experiment with DDL commands. 2. Create tables for an employee payroll system using appropriate data types and constraints. 3. Experiment with DML commands. 4. Make use of Arithmetic operations on tables. 5. Determine where clause usage 6. Use CASE to display employee grades based on salary. 7. Make use of Built-in functions 8. Display department-wise total salary and average salary using group functions 9. Make use of Joins and set operations 10. Retrieve employees earning more than the average salary using a sub query. **Test II PL/SQL Block structure** 1. Write a PL/SQL block to calculate and display simple interest. 2. Make use of Embedded SQL 3. Test for Cursors usage 4. Make use of Exceptions 5. Experiment with PL/SQL Records and Tables. 6. Write a function and procedures to return total marks of a student. 7. Create a trigger to prevent deletion of records from a table 8. Experiment Java as Front end and connect the tables.	**60**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group Task.(GD)

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi
Verified by HOD	Mr. K. Vijayakumar	K.V.JAYAKUMAR, M.C.A., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT310			Title	Batch:	2026 - 2029
				CC Lab. – IV: Advanced Excel	Semester:	III
Practical Hrs./Week	4	Tutorial Hrs./Sem.	-		Credits:	2

Course Objective

To use functions and productivity tools to assist in developing worksheets and to manipulate data lists using various functions.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To apply different features of excel	PO1(3), PO2(2), PO3(2), PO4(3), PO5(3), PO8(2), PO9(1), PO10(3), PO11(2), PO15(2)
CO2	To apply concept of different formulas used in excel	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(1), PO8(2), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO3	To verify Formatting techniques and presentation styles.	PO1(3), PO2(2), PO3(2), PO4(3), PO5(3), PO6(1), PO8(3), PO9(2), PO10(3), PO11(2), PO14(1), PO15(2)
CO4	To verify Manipulation of data using data names and ranges, filters and sort, and validation lists	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To create clip art to enhance ideas and information in Excel worksheets.	PO1(3), PO2(2), PO3(2), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(3), PO10(3), PO11(3), PO13(1), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	3	3	–	–	2	1	3	2	–	–	–	2
CO2	3	2	3	3	3	1	–	2	2	3	2	–	–	1	2
CO3	3	2	2	3	3	1	–	3	2	3	2	–	–	1	2
CO4	3	3	3	3	3	2	1	3	3	3	2	–	1	1	2
CO5	3	2	2	3	3	2	1	3	3	3	3	–	1	1	3

3 Point Scale – 1, 2, 3

Content	Hrs.
SAMPLE PROGRAM LIST Test I 1. Inserting Basic Math And Statistics Functions 2. Using date functions 3. Logical Function- IF function 4. Look up Functions 5. Financial Functions Test II 1. Large Datasets Freezing and Printing 2. Conditional Formatting 3. Pivot Table creation with chart 4. Advanced Filtering 5. Database functions	**60**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group Task(GD)

Course Designed by	Dr. C.R. Durga devi	C.R. Durga devi
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT3N1			**Title**	**Batch:**	2026 - 2029
				EDC - I : Lab. Social Media Analytics	**Semester:**	III
Lecture Hrs./Week	1	**Tutorial Hrs./Sem.**	-		**Credits:**	1

Course Objective

To develop responsible and effective skills in using social media platforms for communication, engagement, and professional growth.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To Identify major social media platforms, their features, and usage purposes.	PO1(3), PO2(2), PO3(1), PO4(1), PO5(1), PO8(1), PO10(3), PO11(1), PO13(1), PO15(2)
CO2	To Explain ethical, legal, and safety issues related to social media usage.	PO1(2), PO2(2), PO3(3), PO4(2), PO5(2), PO6(1), PO8(2), PO9(2), PO10(2), PO12(2), PO13(3), PO15(1)
CO3	To Create and manage social media profiles and content following best practices.	PO1(2), PO2(3), PO3(2), PO4(3), PO5(2), PO6(1), PO7(2), PO8(2), PO9(1), PO10(3), PO11(2), PO12(1), PO13(2), PO14(2), PO15(2)
CO4	To Analyze user engagement and usage patterns across different social media platforms.	PO1(2), PO2(2), PO3(3), PO4(2), PO5(3), PO6(3), PO7(1), PO8(3), PO9(2), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To Evaluate the impact of social media usage on individuals or organizations and recommend responsible usage strategies.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(3), PO10(2), PO11(2), PO12(2), PO13(3), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	-	-	1	-	3	1	-	1	-	2
CO2	2	2	3	2	2	1	-	2	2	2	-	2	3	-	1
CO3	2	3	2	3	2	1	2	2	1	3	2	1	2	2	2
CO4	2	2	3	2	3	3	1	3	2	3	2	-	1	1	2
CO5	3	3	3	3	3	2	2	3	3	2	2	2	3	2	3

Contents	Hrs.
1. To Create accounts and explore features of popular social media platforms 2. Design a professional and ethical social media profile with appropriate bio, privacy settings, and security options. 3. Create and post different types of content (text, image, video, reels) following platform guidelines. 4. Identify and use relevant hash tags and keywords to improve post reach and visibility. 5. Observe and record likes, shares, comments, and views for posted content over a fixed period. 6. Configure privacy controls, two-factor authentication, and content visibility options. 7. Study and report on issues such as cyber bullying, fake news, plagiarism, and digital footprint. 8. Analyze screen time usage and suggest strategies for healthy social media habits. 9. Create a LinkedIn profile, connect with professionals, and explore job, internship, and learning features. 10. Plan and execute a small awareness or educational campaign and evaluate its reach and impact.	**15**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT3N2			Title	Batch:	2026 - 2029
				EDC - I : Lab. Basics of Hardware	Semester:	III
Lecture Hrs./Week	1	Tutorial Hrs./Sem.	-		Credits:	1

Course Objective

To provide hands-on knowledge of computer hardware components, assembly, installation, and maintenance.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To Identify basic computer hardware components and their functions.	PO1(3), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To Explain the working principles of internal and external hardware devices..	PO1(3), PO2(2), PO3(2), PO4(1), PO5(1), PO6(1), PO8(2), PO10(2), PO11(1), PO13(1), PO15(1)
CO3	To construct a computer system and perform operating system installation.	PO1(3), PO2(2), PO3(2), PO4(3), PO5(2), PO6(2), PO7(2), PO8(2), PO9(1), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To Analyze hardware and software-related issues and perform systematic troubleshooting.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To evaluate system performance and recommend suitable hardware upgrades or maintenance strategies.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(3), PO10(3), PO11(2), PO12(1), PO13(3), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	2	2	1	1	1	-	2	-	2	1	-	1	-	1
CO3	3	2	2	3	2	2	2	2	1	3	2	-	2	2	2
CO4	3	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	3	3	3	3	2	2	3	3	3	2	1	3	2	3

3 Point Scale – 1, 2, 3

Contents	Hrs.
1. Identification of Computer Hardware Components **2.** PC Assembly and Disassembly **3.** Study of Motherboard and BIOS/UEFI Settings **4.** Installation of RAM and Storage Devices **5.** Installation of Operating System **6.** Device Driver Installation and Verification **7.** Hard Disk Partitioning and Formatting **8.** Troubleshooting Hardware Issues **9.** Study of Input and Output Devices **10.** Preventive Maintenance of Computer System	**15**

Pedagogy and Assessment Methods:

Digital Presentation, Chalk and talk, Flipped class, Seminar Quiz, Assignments

Course Designed by	Mr. R.Sekar	
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT3VA			Title	Batch:	2026 - 2029
				VAC I:	Semester:	III
Lecture Hrs./Week	30 Hrs.	Tutorial Hrs./Sem.	-	UI / UX Designing	Credits:	2*

Course Objective

To gain a comprehensive understanding of the design process, user research methodologies, information architecture, interaction design, visual design principles, and prototyping techniques..

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To Design and develop responsive layouts for real-world societal applications using modern UI/UX principles.	PO1(3), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(3), PO11(1), PO13(1), PO15(1)
CO2	To identify and define real-world customer problems through critical analysis and research.	PO1(2), PO2(2), PO3(2), PO4(1), PO5(1), PO6(1), PO8(2), PO10(3), PO11(1), PO13(1), PO15(1)
CO3	To Apply standard UI style guides to create consistent, accessible, and visually appealing interfaces.	PO1(2), PO2(3), PO3(2), PO4(3), PO5(2), PO6(2), PO7(2), PO8(2), PO9(1), PO10(3), PO11(2), PO12(1), PO13(2), PO14(2), PO15(2)
CO4	To Analyze and implement various user interface interaction patterns to enhance usability and user engagement.	PO1(2), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To evaluate and utilize open-source collaborative platforms for interface design and team-based workflows.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(3), PO10(3), PO11(2), PO12(1), PO13(3), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	1	1	-	-	1	-	3	1	-	1	-	1
CO2	2	2	2	1	1	1	-	2	-	3	1	-	1	-	1
CO3	2	3	2	3	2	2	2	2	1	3	2	1	2	2	2
CO4	2	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	3	3	3	3	2	2	3	3	3	2	1	3	2	3

Contents	Hrs.
1. To design a responsive layout for a societal application. 2. To explore various UI interaction patterns. 3. To develop an Interface with Proper UI Style Guides. 4. To Developing wire flow diagram for application using open-source Software 5. To Explore Various Open-Source Collaborative Interface Platform. 6. To apply the design thinking process for a new product. 7. To generate innovative and practical feature ideas for a proposed product, 8. To establish the visual design and user experience for a new Project. 9. Create a Sample Pattern Library for the product (Mood board, Fonts, Colors based on UI principles) 10. To Identify a customer problem to solve 11.To Conduct end-to-end user research - User research, creating personas, Ideation process (User stories, Scenarios), Flow diagrams, Flow Mapping 12. To Sketch, design with popular tool and build a prototype and perform usability testing and identify improvements	**30**

Pedagogy and Assessment Methods:

Digital Presentation, Chalk and talk, Flipped class, Seminar Quiz, Assignments

Course Designed by	Ms. V. Prabavathi	V. Prabavathi.
Verified by HOD	Mr. K. Vijayakumar	AYAKUMAR, MCA.,M.Phil., ...of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT411			**Title**	**Batch:**	2026 - 2029
				CC -VII : Data Communication and Networks	**Semester:**	IV
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

To provide basic concepts of networking like data transmission, topology, OSI model, TCP/IP, transmission media, X.25 protocol, frame relay, ATM and accessing the internet.

Course Outcomes

On the successful completion of the course, students will be able

CO Number	CO Statement	PO Mapping
CO1	To recall basics of data communication and networking	PO1(3), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To demonstrate various types of networks and topologies	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO8(2), PO10(2), PO11(1), PO13(1), PO15(1)
CO3	To make use of routing algorithms	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(1), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To categorize different ways of accessing the internet	PO1(2), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO7(1), PO8(2), PO9(1), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To Compare various types of protocols(X.25,Frame relay, ISDN, ATM)	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(2), PO10(2), PO11(2), PO12(1), PO13(2), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	2	2	2	2	1	-	2	-	2	1	-	1	-	1
CO3	3	2	3	3	3	3	2	3	1	3	2	-	2	2	2
CO4	2	2	2	2	2	1	1	2	1	3	2	-	1	1	2
CO5	3	3	3	3	3	2	2	3	2	2	2	1	2	2	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	Introduction to Data Communications and Networking – Information Encoding - Analog and Digital Transmission Methods – Modes of Data Transmission and Multiplexing.	14
Unit II	**Transmission Errors**: Detection and Correction –**Transmission Media**: Guided Media, Unguided Media. **Network Topologies**: Mesh, Star, Tree, Ring, Bus topology. Switching- Circuit, Message, Packet switching. Routers and Routing – Factors affecting Routing Algorithms – Routing Algorithms – Approaches to Routing.	15
Unit III	Network Protocols and OSI Model – TCP/IP - Local Area Networks (LAN), Metropolitan Area Networks (MAN) and Wide Area Networks (WAN) – Integrated Services Digital Network (ISDN).	15
Unit IV	**X.25 Protoco**l: Working principle-Characteristics – Packet format – operations. **Frame Relay:** Need – Working principle – Frame format-congestion & traffic control – FRAD & Features. **Asynchronous Transfer Mode:** Introduction- Packet size- Virtual circuits – Cells- Switching, Layers.	16
Unit V	Internetworking Concepts, Devices, Internet Basics, History and Architecture. **Ways of Accessing the Internet:** Introduction- Dial- up access- Leased lines- DSL- Cable modems.	15
	Total Contact Hrs.	**75**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task(GD/ Role Play /APS)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Achyut S.Godbole	Data Communications and Networks	Tata McGraw-Hill Publishing Company Limited, Ninth reprint	2007

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Behrouz A. Forouzan	Data Communications and Networking	2nd Edition Update. Tata McGraw-Hill Publishing Company Limited, Nineteenth reprint	2007
2	Andrew S. Tanenbaum	Computer Networks	3rd Edition, Prentice Hall of India	2000
3	**Web Reference** https://www.cisco.com/c/en_in/solutions/small-business/resource-center/networking/networking-basics.html https://www.techopedia.com/definition/7776/internet-access			

Course Designed by	Ms. V. Prabavathi	V. Prabavathi.
Verified by HOD	Mr. K. Vijayakumar	K. Vijayakumar AKUMAR, MCA.,M.Phil., of Information Technology NGM College (Autonomous) POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT412			**Title**	**Batch:**	2026 - 2029
				CC - VIII: Advanced Java Programming	**Semester:**	IV
Lecture Hrs./Week	4	**Tutorial Hrs./Sem.**	5		**Credits:**	4

Course Objective

On successful completion of this subject the students can understand various concepts of JDBC, Servlet, JSP, JSTL, etc.

Course Outcome

On the successful completion of the course, students will be able

CO Number	CO Statement	PO Mapping
CO1	To recollect the knowledge of GUI based applications, Web based applications and Database applications.	PO1(3), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To understand development of the Internet programming through JavaFX programming.	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO8(2), PO10(3), PO11(2), PO13(1), PO15(2)
CO3	To apply different powerful GUI components from existing applications to create new web pages.	PO1(3), PO2(3), PO3(2), PO4(3), PO5(2), PO6(2), PO7(2), PO8(2), PO9(1), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To analysis different applications for solving the real time problems in Industry.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To Prove the various concepts using problems.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO12(1), PO13(2), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	2	2	2	2	1	-	2	-	3	2	-	1	-	2
CO3	3	3	2	3	2	2	2	2	1	3	2	-	2	2	2
CO4	3	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	3	3	3	3	2	2	3	2	3	2	1	2	2	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs. L+T
Unit I	Getting Started With Web Application In Java: Introduction – Benefits- Technologies Used In Web Applications- Web Architecture Models- MVC Architecture. Getting Started With JDBC: Introduction-Defining ODBC- Introducing JDBC- JDBC Architecture- Working with JDBC API.	12+1
Unit II	Implementing JDBC Statement and Resultsets: JDBC Statements- Statement Interface- Prepared Statement Interface- Callable Statement Interface- Result Set Interface- Handling NULL Values- Resultset Metadata Interface- SQL Editor In JAVA- Advanced Concepts of Resultset- Closing the Connection- Database Metadata Interface	11+1
Unit III	Understanding JAVA Servlet: Need For Server Side Extension-CGI- JAVA Servlet-Container-API- Object-Lifecycle- Developing The First Servlet Application- Understanding The Request Processing Overflow- Working With Generic Servlet Class. Understanding Request Processing And HTTP: Implementing The Servlet Request Interface- Working With Initialization Parameters-Context Initialization Parameters- Servlet Response- Request Dispatching-Request Attributes- HTTP Basic –Httpservletrequest and Httpservletresponse- Httpservlet.	10+1
Unit IV	Introduction To JSP: JSP And Its Lifecycle- Creating Simple JSP Pages- Working With JSP Basic Tags And Implicit Objects: Exploring Scripting Tags- Implicit Objects- Directive Tags- Working with Java Bean And Action Tags In JSP: Javabean- Action Tags- Declaring A Bean In JSP	10+1
Unit V	Working With JSP Standard TAG Library- JSTL Core Tags-SQL Tags- Formatting Tags- XML Tags. Working With Java server Faces: JSF Features- JSF 2.2 – Architecture- Elements-Lifecycle-Tag Libraries.	12+1
	Total Contact Hrs.	**60**

Pedagogy and Assessment Methods:

Digital Presentation, Chalk and talk, Flipped class, Seminar, Test, Assignment, Group task

Text Books:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Santhosh Kumar	JDBC 4.2, SERVLET 3.1 and JSP 2.3 INCLUDES JSF2.2 and DESIGN PATTERNS BLACK BOOK	Dreamtech press	2018

Reference Book:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Rashim Mogha, V.V. Preetham	Java Web Services Programming	Willy India Pub	2010
2	**Web Reference** https://www.javatpoint.com/servlet-tutorial/ https://www.softwaretestinghelp.com/java-components-java-platform-jdk/			

Course Designed by	Ms. V. Prabavathi	V. Prabavathi.
Verified by HOD	Mr. K. Vijayakumar	K. VIJAYAKUMAR, MCA.,M.Phil., Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT4A1			Title	Batch:	2026 - 2029
				Allied : Software Engineering	Semester:	IV
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

Understand the software development life cycle, process models, requirements analysis, design concepts, software quality and testing techniques

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Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To recollect the various process models, requirements, Designs, Quality, Testing.	PO1(3), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To Understand the software development phases.	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO8(2), PO10(2), PO11(1), PO13(1), PO15(1)
CO3	To apply concepts into the testing lab.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(1), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To evaluate the expected result with testing output.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To justify the concepts of software development and testing phase.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO12(1), PO13(3), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	2	2	2	2	1	-	2	-	2	1	-	1	-	1
CO3	3	2	3	3	3	3	2	3	1	3	2	-	2	2	2
CO4	3	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	3	3	3	3	2	2	3	2	3	2	1	3	2	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**Software and Software Engineering:** The Nature of software-The Unique Nature of WebApps-Software Engineering-The software process-Software Engineering practice- Software Myths. **Process Models:** A Generic process model-Process Assessment and Improvement-Perspective process model-Specialized process models-The Unified process- Personal and team process models-process Technology-Product and Process. **AGILE Development**: Agility – Cost of change - Process - **Extreme programming**: Values – Process – Industry – Debate.	13
Unit II	Requirement analysis-Scenario based modeling-UML Models-Data modeling concepts-Class based modeling. **Requirements Modeling:** Flow (DFD, Activity, ER), Behavior, Patterns - and WebApps.	10
Unit III	**Design concepts:** The design process-Design concepts-Design model. **User Interface Design:** The golden rule-User Interface Analysis and Design-Interface Analysis-Interface Design Steps-WebApp Interface Design-Design evaluation.	12
Unit IV	**Quality Concepts:** Software Quality-Dilemma-Achieving Software Quality. **Software Quality Assurance:** Elements – Tasks, Goals and metrics – Statistical SQA – Software reliability – SQA plan**.**	12
Unit V	**Software Testing strategies:** Strategic Approach to Software Testing-Strategic Issues-Unit Testing-Integration Testing-Validation Testing-System Testing. **Testing conventional Applications:** Software Testing Fundamentals-Internal and External view of Testing-White Box Testing-Basis Path Testing - Control Structure Testing-Black Box Testing. **Case study:** Draft an ER & DFD for a unique problem.	13
	Total Contact Hrs.	**60**

Pedagogy and Assessment Methods:

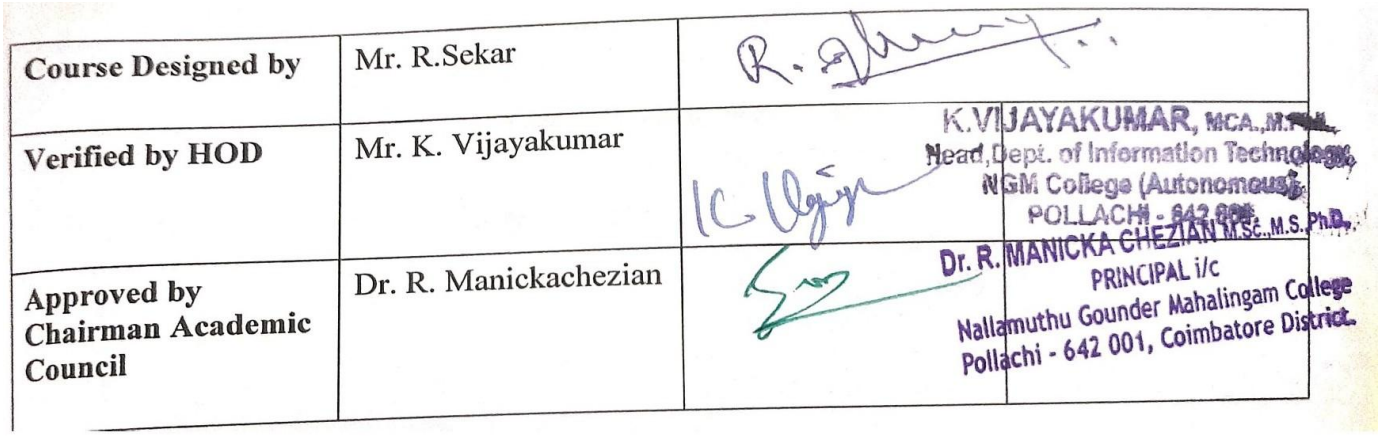
Digital Presentation, Chalk and talk, Flipped class, Seminar, Quiz, Assignment, Group task.

Text Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Roger S. Pressman	Software Engineering-A Practitioner's Approach	8th Edition, McGraw-Hill International Pub	2019
2	Jeffrey A. Hoffer, Joey F. Georgr, Joseph S. Valacich	Modern Systems Analysis and Design	2nd Edition, Pearson Education publications	2000

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Richard Fairley	Software Engineering Concepts	33rd Reprint, Tata McGraw-Hill Publishing Company Limited	2010
2	PankajJalote	An Integrated Approach to Software Engineering	3rd Edition Narosa Publication	2001
3	**Web Reference** https://www.roberthalf.com.au/blog/employers/6-basic-sdlc-methodologies-which-one-best https://www.tutorialspoint.com/software_engineering/software_testing_overview.htm#:~:text=Software%20Testing%20is%20evaluation%20of,comprises%20of%20Validation%20and%20Verification.			



Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT4A2			**Title**	**Batch:**	2026 - 2029
				Allied : Software Testing	**Semester:**	IV
Lecture Hrs./Week	4	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

To equip learners with knowledge of software life cycle models, quality principles, and comprehensive software testing techniques for delivering reliable and high-quality software.

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Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To recollect the phases and models of SDLC.	PO1(3), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To Understand the software quality, Quality Assurance and Quality Control.	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO8(2), PO10(2), PO11(1), PO13(1), PO15(1)
CO3	To apply concepts of testing methods.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(1), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To evaluate the system, performance, and regression testing.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To justify the test planning and test metrics.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO12(1), PO13(3), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	2	2	2	2	1	-	2	-	2	1	-	1	-	1
CO3	3	2	3	3	3	3	2	3	1	3	2	-	2	2	2
CO4	3	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	3	3	3	3	2	2	3	2	3	2	1	3	2	3

3 Point Scale – 1, 2, 3

26UIT4A2

Units	Content	Hrs.
Unit I	**Software Development Life Cycle models:** Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. **White-Box Testing**: Static Testing – Structural Testing – Challenges in White-Box Testing.	13
Unit II	**Black-Box Testing:** Introduction - Need – Applications – Methodology – Challenges - **Integration Testing:** Integration Testing as Type of Testing – Integration Testing as a Phase of Testing – Scenario Testing – Defect Bash	11
Unit III	**System and Acceptance Testing:** System Testing Overview – Objectives – Functional versus Non-functional Testing - Functional testing - Non-functional Testing – Acceptance Testing – Summary of Testing Phases.	11
Unit IV	**Performance Testing:** Factors governing Performance Testing – Methodology of Performance Testing – Tools for Performance Testing – Process for Performance Testing – Challenges. **Regression Testing:** Introduction – Types of Regression Testing – Scenario – Strategies – Best Practices in Regression Testing.	13
Unit V	**Test Planning, Management, Execution and Reporting:** Test Planning – Test Management – Test Process – Test Reporting –Best Practices. **Test Metrics and Measurements:** Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics.	12
	Total Contact Hrs.	**60**

Pedagogy and Assessment Methods:

Digital Presentation, Chalk and talk, Flipped class, Seminar, Quiz, Assignment, Group task.

Text Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Srinivasan Desikan & Gopalswamy Ramesh	Software Testing Principles and Practices	Pearson Education	2012

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Dorothy Graham, Rex Black, and Erik van Veenendaal	Foundations of Software Testing	5th Edition, Cengage Learning EMEA	2024
2	Paul C. Jorgensen	Software Testing: A Craftsman's Approach	5th Edition, CRC Press	2026
3	**Web Reference** https://www.geeksforgeeks.org/software-testing/software-testing-tutorial/ https://www.tutorialspoint.com/software_testing/index.htm			

Course Designed by	Dr. B. Kalaiselvi	B. Kalai.
Verified by HOD	Mr. K. Vijayakumar	K.V. JAYAKUMAR, MCA., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT413			**Title**	**Batch:**	2026 - 2029
				CC Lab. – V: Advanced Java	**Semester:**	IV
Practical Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	3

Course Objective

Understand the practical experience in various concepts of JavaFX,, JDBC, Servlet, JSP, JSTL, AJAX, etc...

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To apply the different components of JavaFX programming.	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO7(1), PO8(2), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO2	To analysis the concepts to enhance in the application level.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(1), PO10(3), PO11(2), PO13(1), PO14(2), PO15(2)
CO3	To validate the user friendliness and desire performance implied for given input.	PO1(2), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To test the different components of Advanced Java using programs.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To create connectivity using database.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO12(1), PO13(2), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	2	2	1	1	2	-	3	2	-	1	1	2
CO2	3	2	3	3	3	2	1	3	1	3	2	-	1	2	2
CO3	2	3	3	3	3	2	2	3	2	3	2	-	2	2	2
CO4	3	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	2	3	3	3	3	2	3	2	3	2	1	2	2	3

3 Point Scale – 1, 2, 3

Contents	Hrs.
Test I 1. Create a JavaFX application with a button. When clicked, it displays a message in a label. 2. Construct an application where a user can enter their name in a TextField. When the user clicks a button, the app displays a greeting message with the entered name. 3. Design an application that uses a ComboBox to select a fruit. Based on the selection, display a corresponding message in a label. 4. Create a JavaFX application with RadioButton options to choose a favorite color. Display the chosen color in a label. 5. Design a simple calculator with buttons for digits and basic operations like addition and subtraction. 6. Create a simple timer application that starts counting from 0 when a button is clicked. **Test II** 7. Construct an image viewer that can load and display an image from a file path. You can add a TextField to specify the image path. 8. Develop a Generic Servlet. 9. Implement JDBC using Servlet. 10. Create a progress bar that fills up when a button is clicked. 11. Design a login form with TextField for the username, Password Field for the password, and a Button to submit. Display a message based on whether the login is successful. 12. Create a JavaFX application that opens a file dialog to choose a text file, reads its content, and displays the content in a TextArea.	**75**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Quiz , Group task(GD/Role play/abs).

Course Designed by	Ms. V. Prabavathi	V. Prabavathi.
Verified by HOD	Mr. K. Vijayakumar	YAKUMAR, MCA.,M.Phil., ...of Information Technology, NGM College (Autonomous), POLLACHI - 642 ...
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT4S1			Title	Batch:	2026 - 2029
				SEC - II :Naan Mudhalvan : DevOps Fundamentals Lab.	Semester:	IV
Practical Hrs./Week	2	Tutorial Hrs./Sem.	--		Credits:	1

Course Objective

To known the various programming concepts of database, string functions, date & time functions, content navigation and creating web page.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To motivate the students to create dynamic website	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO7(1), PO8(2), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO2	To test the various tags in the application.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(2), PO6(2), PO7(1), PO8(3), PO9(1), PO10(3), PO11(2), PO13(1), PO14(2), PO15(2)
CO3	To create files in the website using database.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To construct and upload a file to the server and create directory	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To choose and add the products that are selected from a web page	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO12(1), PO13(2), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	2	2	1	1	2	-	3	2	-	1	1	2
CO2	3	2	3	3	2	2	1	3	1	3	2	-	1	2	2
CO3	3	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO4	3	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	3	3	3	3	2	2	3	2	3	2	1	2	2	3

3 Point Scale – 1, 2, 3

Content	Hrs.
SAMPLE PROGRAM LIST 1. Initialize a local Git repository and perform basic commit operations using Command line. 2. Create a GitHub repository and push local project files to GitHub using command prompt. 3. Clone an existing GitHub repository to local system using command line. 4. Create branches in Git, perform changes, and merge branches using command line. 5. Create and host a simple static website using HTML and push it to GitHub. 6. Deploy the static website using Vercel or Netlify from GitHub repository. 7. Perform continuous deployment by updating the project and verifying automatic deployment	30
Total Contact Hrs.	30

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group Discussion

Course Designed by	Ms. V. Prabavathi	V. Prabavathi.	
Verified by HOD	Mr. K. Vijayakumar	K. Vijay	YAKUMAR, MCA.,M.Phil., of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian		Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT4N1			Title	Batch:	2026 - 2029
				EDC - II : Lab.: Data Analytics	Semester:	IV
Lecture Hrs./Week	1	Tutorial Hrs./Sem.	-		Credits:	1

Course Objective

To bestow an understanding of various concepts of data analytics, tools, applications and career opportunities in the field of data analytics.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To keep in mind the basic understanding of fundamentals of data analytics using power BI	PO1(3), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(3), PO11(1), PO13(1), PO15(1)
CO2	To understand the types of data analytics	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO8(2), PO10(3), PO11(2), PO13(1), PO15(2)
CO3	To apply the power BI tools in various domain	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To identify career opportunities in Data Analysis	PO1(2), PO2(3), PO3(2), PO4(2), PO5(2), PO6(1), PO7(2), PO8(2), PO9(2), PO10(3), PO11(2), PO12(2), PO13(1), PO14(2), PO15(3)
CO5	To interpret technical skill of data scientist	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO12(1), PO13(2), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	1	1	-	-	1	-	3	1	-	1	-	1
CO2	3	2	2	2	2	1	-	2	-	3	2	-	1	-	2
CO3	3	3	3	3	3	3	2	3	2	3	2	-	2	2	2
CO4	2	3	2	2	2	1	2	2	2	3	2	2	1	2	3
CO5	3	3	3	3	3	2	2	3	2	3	2	1	2	2	3

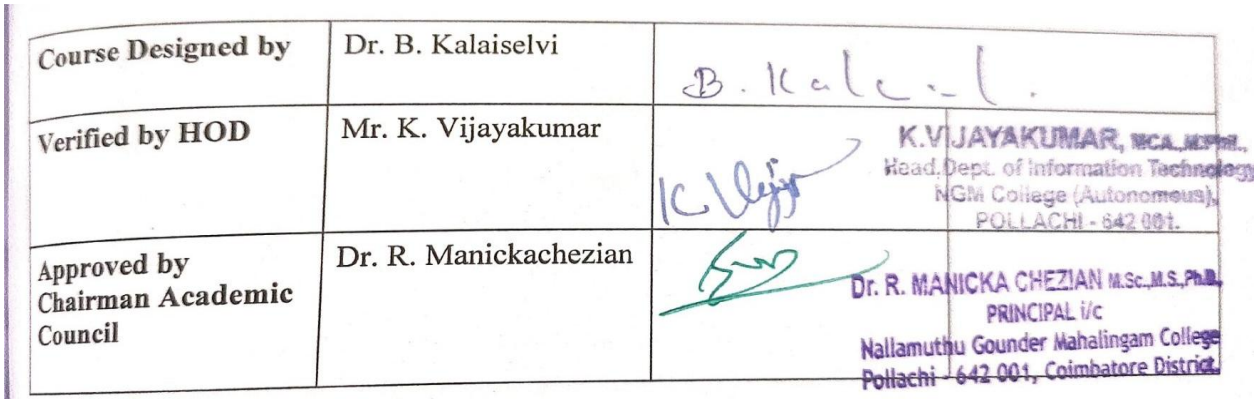
3 Point Scale – 1, 2, 3

Content	Hrs.
SAMPLE PROGRAM LIST 1. Basic Data Import and Transformation • Import data from an Excel file (e.g., sales data). • Clean the data by removing unnecessary columns. • Handle missing values (e.g., fill, remove, or replace them). • Create new columns using basic transformations • Load the data into Power BI for reporting. 2. Building Basic Visualizations • Create a basic bar chart showing total sales by region. • Build a line graph showing sales over time (month-wise or year-wise). • Create a pie chart showing the market share of each product. • Customize visualizations by changing colors, fonts, and labels. 3. Data Modeling with Relationships • Import multiple tables (e.g., Sales, Products, Customers). • Create relationships between tables (e.g., connect Sales to Products via ProductID). • Create calculated columns to enhance data modeling. • Use Power BI's model view to visualize the relationships. 4. DAX Calculations and Measures • Create simple measures like Total Sales, Average Sales, and Sales Growth. • Use conditional DAX expressions (e.g., IF, SWITCH). • Create Time Intelligence measures (e.g., YTD, QTD, MTD). • Explore the use of calculated columns (e.g., a new column for sales category). 5. Using Slicers and Filters • Add a slicer to filter data by Region. • Create multiple slicers (e.g., by Product Category, Date). • Use page-level and report-level filters. • Test interactivity and ensure visuals are updating as per slicer/filter selections. 6. Creating Dashboards and Reports • Combine charts, tables, and KPIs into a single report. • Use text boxes and shapes for labeling and organizing the report layout. • Create a "Home" page as the main dashboard and link it to detailed report pages. • Apply a theme and make the dashboard visually appealing. 7. Time-Based Analysis and Trends • Create a time-based trend analysis (e.g., monthly or yearly sales). • Implement a moving average to smooth out fluctuations in sales data. • Use date hierarchies for drill-downs (e.g., from year → quarter → month). • Apply Time Intelligence DAX functions to compare this year's performance with last year's. 8. Power BI Service: Publish and Share Reports • Publish a report from Power BI Desktop to Power BI Service. • Create a workspace for team collaboration. • Share the report with colleagues or stakeholders. • Explore Power BI Service features like datasets, apps, and dataflows.	15

9. Advanced Visualizations (Map, TreeMap, Waterfall) • Create a Map visual to show sales data by location (e.g., country or city). • Use a TreeMap to visualize sales distribution by product category. • Create a Waterfall chart to show the incremental changes in profit over time. • Customize the appearance of these advanced visuals. 10. Advanced DAX: CALCULATE and FILTER • Use `CALCULATE` to change the context of a measure. • Apply `FILTER` to create custom filters on a dataset. • Use `ALL` to remove filters and calculate a grand total.	
Total Contact Hrs.	30

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Seminar, Quiz, Assignments



Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi.
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head, Dept. of Information Technology NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT4N2			Title	Batch:	2026 - 2029
				EDC - II : Lab. : Workplace Digitization	Semester:	IV
Lecture Hrs./Week	1	Tutorial Hrs./Sem.	--		Credits:	1

Course Objective

To reinforce human connections is even more important when people are working remotely and interacting with their customers digitally.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To keep in mind the fundamentals of workplace digitization techniques	PO1(3), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(3), PO11(1), PO13(1), PO15(1)
CO2	To understand the types of digitization tools.	PO1(2), PO2(2), PO3(2), PO4(1), PO5(1), PO6(1), PO8(2), PO10(3), PO11(1), PO13(1), PO15(1)
CO3	To apply and identify various cloud based applications in office automation	PO1(2), PO2(3), PO3(2), PO4(3), PO5(2), PO6(2), PO7(2), PO8(2), PO9(1), PO10(3), PO11(2), PO12(1), PO13(2), PO14(2), PO15(2)
CO4	To analyze efficiency and usefulness of digitization	PO1(2), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To assess the features available in cloud based digitization tools.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(3), PO10(3), PO11(2), PO12(1), PO13(3), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	1	1	-	-	1	-	3	1	-	1	-	1
CO2	2	2	2	1	1	1	-	2	-	3	1	-	1	-	1
CO3	2	3	2	3	2	2	2	2	1	3	2	1	2	2	2
CO4	2	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	3	3	3	3	2	2	3	3	3	2	1	3	2	3

3 Point Scale – 1, 2, 3

Contents	Hrs.
1. Form: Collecting data through customizable online surveys, quizzes, and feedback forms. 2. Sheets: Collaboratively creating, analyzing, and managing spreadsheets for various data-driven tasks. 3. Google News: Aggregating and presenting news articles from various sources, allowing users to stay informed about current events and topics of interest. 4. Slides: Creating visually engaging presentations for proposals, sales pitches, marketing materials, or training sessions. 5. Meet and Chat: Facilitating video meetings and real-time collaboration through instant messaging for remote teamwork. Gmail: Efficiently managing email 6. Communication, scheduling, and organizing messages for professional correspondence. 7. Drive: Organizing, storing, and sharing files securely, facilitating collaborative work and easy access to documents from any device. 8. Calendar: Managing schedules, events, and appointments, facilitating efficient time management and coordination among individuals or teams 9. Translate: Facilitating instant translation of text between languages for communication and comprehension across diverse linguistic contexts	**15**

Course Designed by	Ms. V. Prabavathi	V. Prabavathi.	
Verified by HOD	Mr. K. Vijayakumar	K. Vijay	AKUMAR, MCA.,M.Phil., of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian		Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT4VA			**Title**	**Batch:**	**2026 - 2029**
				VAC II:	**Semester:**	1V
Lecture Hrs./Week	30 Hrs.	**Tutorial Hrs./Sem.**	-	Statistical Computing with R	**Credits:**	2*

Course Objective

On successful completion of this subject the students can understand various concepts of Data Visualization

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To keep in mind the fundamentals of visualization	PO1(3), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(3), PO11(1), PO13(1), PO15(1)
CO2	To understand the types of charts	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO8(2), PO10(3), PO11(2), PO13(1), PO15(2)
CO3	To apply and identify various types of Libraries for data visualization	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To analyze the data in different aspects	PO1(2), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To Assess the concepts of Data visualization	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO12(1), PO13(2), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	1	1	-	-	1	-	3	1	-	1	-	1
CO2	3	2	2	2	2	1	-	2	-	3	2	-	1	-	2
CO3	3	3	3	3	3	3	2	3	2	3	2	-	2	2	2
CO4	2	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	3	3	3	3	2	2	3	2	3	2	1	2	2	3

3 Point Scale – 1, 2, 3

Content	Hrs.
1. Write R code to create a user-defined function 2. Write R code to implement recursive function (factorial/Fibonacci) 3. Write R code to create function with arguments and return values 4. Write R code to concatenate strings 5. Write R code to count number of characters in a string 6. Write R code to reverse a string 7. Write R code to check palindrome string 8. Write R code to calculate mean, median, standard deviation 9. Write R code to find correlation and covariance 10. Write R code to perform linear regression 11. Write R code to create bar chart 12. Write R code to create pie chart 13. Write R code to create histogram 14. Write R code to create line graph 15. Write R code to create scatter plot 16. Write R code to read CSV file 17. Write R code to write CSV file 18. Write R code to read Excel file 19. Write R code to write data to file 20. Write R code to perform K-means clustering	**30 Hrs**
Total Contact Hrs.	**30**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group Discussion

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi
Verified by HOD	Mr. K. Vijayakumar	K.V. JAYAKUMAR, M.C.A., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT514			Title	Batch:	2026 - 2029
				CC - IX : Full Stack Web Development using Python	Semester:	V
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

To understand various concepts of Python and expertise in Python programming knowledge

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To recollect basic programming concepts	PO1(3), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To understand and familiar with the basic coding in python	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO8(2), PO10(3), PO11(2), PO13(1), PO15(2)
CO3	To apply python terminologies for developing applications in small scale	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(1), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To figure out advanced concepts in python for developing web based	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To assess the web application development using python & flask.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO12(1), PO13(2), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	2	2	2	2	1	-	2	-	3	2	-	1	-	2
CO3	3	2	3	3	3	3	2	3	1	3	2	-	2	2	2
CO4	3	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	3	3	3	3	2	2	3	2	3	2	1	2	2	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**Python Basics**: Introduction – Basic Concepts – Python Installation and Program Execution – Variables and Identifiers – Data Types – Mutable Vs Immutable – Input and Output in Python – Modular Programming – Python Modules. **Operators in Python** – **Functions:** Introduction – Need – Basics – Defining Functions – Passing Variables – Function Arguments – Special Functions.	14
Unit II	**Flow Control:** Conditional Statements and Loops. **Strings:** Creation – Initialization – Accessing Elements – Traversing – String Operations – Difference between Function, Method and Attribute. **Lists**: Introduction – Basic Concepts – Creating, Traversing and Slicing Lists – List Functions and Methods – Nested Lists and using them as Matrix.	15
Unit III	**Dictionaries**: Introduction – Basics – Concepts – Functions and Methods – Dictionary Methods – View Objects. **Tuples**: Introduction – Basic Concepts – Tuple Operations. **Regular Expressions:** Basic Concepts – Special Characters – Groups of Characters – Anchors – Understanding Re Module – Match Object – Important Methods.	15
Unit IV	**File Operations:** Introduction – Basics – Reading and Writing Files. **NumPy**: Introduction – Basics – NDimensional Array – Array Properties and Methods – Broadcasting – Array Indexing – np.linspace – np.meshgrid. **Pandas**: Introduction – Basics – Using Pandas for Files.	16
Unit V	**Flask Web Framework:** Introduction to Web Applications – Client Server Architecture – Introduction to Flask – Installing Flask – Creating a Basic Flask Application – Running Flask Server – Application Structure – Routing and URL Handling – Dynamic Routes – Templates using Jinja2 – Static Files (CSS, JavaScript) – Developing a Simple Flask Web Application.	15
	Total Contact Hrs.	**75**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments

Text Book:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Anurag Gupta, G. P. Biswas	Python Programming – Problem Solving, Packages And Libraries	McGraw Hill Publications	2020

Reference Books:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	SheetalTaneja and Naveen Kumar	Python programming A Modular Approach with Database, Mobile, and Web Applications	Pearson India Education Services	2018
2	Chris Meyers Allen Downey, Jeffrey Elkner	Learning with Python DreamTech Press	Kindle Edition	2015
3	**Web Reference** https://www.youtube.com/watch?v=ApMSoHn1cM4 https://www.youtube.com/watch?v=eaXiOpnRYDE			

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi.
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head, Dept. of Information Technology NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT515			Title	Batch:	2026 - 2029
				CC – X : Digital Security	Semester:	V
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

To endow with better knowledge on various concepts of Security, Symmetric and Asymmetric algorithms, Digital certificates, E-mail, WWW, 2G, 3G etc.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To Recollect basic concepts of network security	PO1(3), PO2(2), PO3(1), PO4(1), PO5(1), PO6(1), PO8(2), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To Understand basic knowledge of cryptography	PO1(3), PO2(3), PO3(2), PO4(2), PO5(2), PO6(2), PO8(2), PO10(2), PO11(1), PO13(1), PO15(1)
CO3	To Apply diverse security mechanisms	PO1(3), PO2(3), PO3(3), PO4(2), PO5(3), PO6(3), PO7(1), PO8(2), PO9(1), PO10(2), PO11(2), PO13(1), PO14(1), PO15(2)
CO4	To Evaluate various Malwares and its types.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(3), PO7(1), PO8(2), PO9(1), PO10(2), PO11(2), PO13(2), PO14(1), PO15(2)
CO5	To Interpret different types of security tips.	PO1(3), PO2(3), PO3(2), PO4(3), PO5(3), PO6(3), PO7(2), PO8(2), PO9(1), PO10(2), PO11(2), PO12(1), PO13(2), PO14(1), PO15(2)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	1	-	2	-	2	1	-	1	-	1
CO2	3	3	2	2	2	2	-	2	-	2	1	-	1	-	1
CO3	3	3	3	2	3	3	1	2	1	2	2	-	1	1	2
CO4	3	3	3	3	3	3	1	2	1	2	2	-	2	1	2
CO5	3	3	2	3	3	3	2	2	1	2	2	1	2	1	2

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**Introduction to cybercrime:** classification – reasons. **Security:** Introduction – Need – Approaches – Principles – Types of attacks. **Malware and its types:** Adware – Spyware – Browser hijacking software – Virus – Worms – Trojan Horse – Scareware. Kinds of cybercrime – Authentication – Encryption. Digital Signature – Anti-virus – Firewall – Steganography – Computer Forensics.	16
Unit II	Reporting Cybercrime – Recent Cybercrime incidents – Cyber security initiatives in India. Generating secure password – Using password manager – Enabling two-step verification – Free Antivirus – Safe browsing – Safe browsing guidelines for social networking sites. Email security tips – Smartphone security guidelines.	14
Unit III	**Cryptography:** Introduction – Plain text and Cipher text – Substitution & Transposition techniques – Encryption and Decryption – Symmetric and Asymmetric key Cryptography – Steganography – Key range and Key size - Possible types of attacks.	15
Unit IV	**Symmetric Key Algorithms**: Introduction - **Algorithm Types and modes* – Overview – DES– IDEA– RC4 & 5 – Blowfish – AES.	14
Unit V	**Asymmetric Key Algorithms**: Introduction – History – Overview - RSA algorithm – **Symmetric and asymmetric cryptography*. **Digital Signatures**: Introduction – Message Digests - MD5 – Secure Hash Algorithm. Knapsack algorithm – Other algorithms.	16
	Total Contact Hrs.	**75**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(GD)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	ATUL KAHATE	CRYPTOGRAPHY and NETWORK SECURITY	3rd Edition, McGraw-Hill Education Pvt Ltd	2013
2	Dr. Jeetendra Pande	Introduction to Cyber Security	Uttarakhand Open University,Haldwani	2017

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	William Stallings	Cryptography and Network Security Principles and Practices	4th Edition. PHI Education Asia	2006
2	Behrouz A. Forouzan	CRYPTOGRAPHY and NETWORK SECURITY	Tata McGraw Hill Pub.	2007
3	**Web Reference** https://www.youtube.com/watch?v=edQlJvaUhHg https://www.youtube.com/watch?v=9OjK9NNlXYY https://www.youtube.com/watch?v=NK5Z6Oj0YkM			

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head, Dept. of Information Technology NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT5E1			**Title**	**Batch:**	2026 - 2029
				DSE- I : Data Mining and warehousing	**Semester:**	V
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

To give a better understanding of various concepts of Data mining includes KDD, Association rules, Classification, Clustering, different types of mining, etc.,

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To identify data mining tools and techniques in building intelligent machines	PO1(3), PO2(1), PO3(2), PO4(1), PO5(1), PO8(1), PO10(3), PO11(1), PO13(1), PO15(1)
CO2	To analyze various data mining algorithms in applying in real time applications.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO8(3), PO9(1), PO10(3), PO11(2), PO13(1), PO14(2), PO15(2)
CO3	To demonstrate the data mining algorithms to combinatorial optimization problems	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(1), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To illustrate the mining techniques like association, classification and clustering on transactional databases.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To evaluate various data mining techniques on complex data objects	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(3), PO12(1), PO13(2), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	2	1	1	-	-	1	-	3	1	-	1	-	1
CO2	3	2	3	3	3	2	-	3	1	3	2	-	1	2	2
CO3	3	2	3	3	3	3	2	3	1	3	2	-	2	2	2
CO4	3	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	3	3	3	3	3	2	3	2	3	3	1	2	2	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs
Unit I	**Data mining and the data warehouse**: Introduction - Data warehouse – Needs - Designing decision support system - integration with data mining - client server and data warehousing - multi processing machines - cost justification - KDD Process - setting up of KDD Environment - ten golden rules. **Data mining**: Introduction – Motivations.	15
Unit II	**Mining frequent patterns, association and correlations**: Basic concepts - market basket analysis - frequent itemset - closed item set and association rules - frequent pattern mining- Efficient and scalable mining methods - Apriori algorithm-generating association rule from frequent item set - improving efficiency of Apriori - mining frequent itemset without candidate generation – using vertical data format-mining closed frequent itemset.	15
Unit III	**Classification and prediction:** Definition – Issues - classification by Decision tree Induction – Bayesian classification-rule based classification - classification by back propagation - support vector machine.	15
Unit IV	**Cluster analysis:** Definition - types of data in cluster analysis - categorization of major clustering methods - partitioning methods - hierarchical methods - density based methods.	15
Unit V	Spatial data mining - multimedia data mining - text mining - mining the www - data mining Applications.	15
	Total Contact Hrs	**75**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(GD/ Role Play /APS)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Jiawei Han and Micheline Kamber	Data Mining concepts and Techniques	Elsevier publication	2005

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Margaret H. Dunham	Data Mining Introductory and Advanced Topics	Pearson Education Publications.	2009
2	Vikram Pudi, P.Radha Krishna	Data Mining	Oxford University Press, First Edition	2009
3	Reema Thareja	Data Warehousing	Oxford University Press	2009
3	**Web Reference** https://youtu.be/m5c27rQtD2E https://youtu.be/6FWIez4lP68			

Course Designed by	Dr. C.R. Durga devi	C.R. Durga devi
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT5E2			**Title**	**Batch:**	2026 - 2029
				DSE - I : Cloud Computing	**Semester:**	V
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

To understand various concepts of cloud computing and learn types of cloud services, usage of cloud etc.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To recollect cloud networking concepts	PO1(3), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To understand and familiar with the basic concepts of cloud computing and python	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO8(2), PO10(3), PO11(2), PO13(1), PO15(2)
CO3	To apply the terminologies in designing cloud based applications	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(1), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To figure out security issues in cloud computing	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(3), PO14(2), PO15(2)
CO5	To judge the pros and cons of various types of cloud providers	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO12(1), PO13(3), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	2	2	2	2	1	-	2	-	3	2	-	1	-	2
CO3	3	2	3	3	3	3	2	3	1	3	2	-	2	2	2
CO4	3	2	3	3	3	3	2	3	2	3	2	-	3	2	2
CO5	3	3	3	3	3	2	2	3	2	3	2	1	3	2	3

Units	Content	Hrs.
Unit I	**Introduction to Cloud Computing:** Characteristics – Models – Services Examples – Services and Applications. **Cloud concepts and technologies:** Virtualization – Load balancing – scalability and elasticity – Deployment – Replication – Monitoring – Software defined Networking – Network function virtualization – MapReduce – Identity and access management - Service level agreements – Billing.	16
Unit II	**Cloud services and Platforms:** Compute – Storage – Database – Application – Content Delivery – analytics – Deployment and Management – Identity and access Management – Open source Private Cloud Software	12
Unit III	. **Hadoop and MapReduce:** Apache Hadoop – MapReduce Job execution – Schedulers – Cluster setup. **Cloud Application Design:** Introduction – Design considerations – Reference Architectures – Design methodologies – Data storage approaches.	16
Unit IV	**Cloud Application Benchmarking and Tuning**: Introduction – Workload Characteristics – Application Performance Metrics – Design Considerations – Benchmarking Tools – Deployment prototyping – Load Testing and Bottleneck Deduction – Hadoop Benchmarking.	15
Unit V	**Cloud Security:** Introduction – CSA Cloud Security Architecture – Authentication – Authorization – Identity and Access Management – Data Security – Key Management – Auditing. **Cloud For Industry, Health Care and Education:** Health Care – Energy systems – Transportation systems – Manufacturing Industry – Education.	16
	Total Contact Hrs.	**75**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(Role Play)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Arshdeep Bahga, Vijay Madisetti	Cloud Computing – A Hands-on Approach	Universities Press Pvt. Ltd.	2016

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Anthony T.Velte, Toby J.Velte, Robert Elsenpeter	Cloud Computing - A Practical Approach	McGraw Hill Publications. Fourteenth reprint	2013
2	Michael Miller	Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online	Que Publishing	2009
3	**Web Reference** https://www.youtube.com/watch?v=RziNWUlBPPM https://www.youtube.com/watch?v=rjY59WLMK2o			

Course Designed by	Dr. C.R. Durga devi	C.R.Durgadevi
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT5E3			Title	Batch:	2026 - 2029
				DSE - I : Mobile Computing	Semester:	V
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

To Understand the various concepts and techniques of WAP, GSM, CDMA, 2G, 3G, 4G etc...

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To keep in mind the various networks, standards, communication medium, Spread spectrum techniques.	PO1(3), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To Understand the basic concepts of wireless networks.	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO8(2), PO10(2), PO11(1), PO13(1), PO15(2)
CO3	To deploy the mobile applications to the devices.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(1), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To analyze the various wireless networks technologies.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To evaluate the importance of mobile communications.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO12(1), PO13(2), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	2	2	2	2	1	-	2	-	2	1	-	1	-	2
CO3	3	2	3	3	3	2	2	3	1	3	2	-	2	2	2
CO4	3	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	3	3	3	3	2	2	3	2	3	2	1	2	2	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**Introduction**: Mobility of Bits and Bytes –Wireless The Beginning – Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Application and services - Security in mobile computing – Standards _ Why is it necessary – Standard bodies. **MOBILE COMPUTING ARCHITECTURE**: Architecture for mobile computing – Three-tier architecture – Mobile computing through Internet – Making existing applications mobile enabled	16
Unit II	**MOBILE COMPUTING THROUGH TELEPHONY**: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – IVR Application – Voice XML – TAPI. **EMERGING TECHNOLOGIES:** Blue Tooth – RFID – WiMAX – Mobile IP – IPv6 – Java Card.	14
Unit III	**GSM:** Global System for mobile communications – GSM Architecture – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – GSM Frequency allocations – Authentications and Security. **SMS:** Strengths – Architecture – SM MT – SM MO – VAS through SMS.	16
Unit IV	**GPRS:** GPRS and packet data network – Architecture – Network Operations – Data services – Applications - Limitations – Billing and Charging. **WAP**: WAE – Useragent & UAProf – WML – WSP – WTP – WDP – Gateway. **MMS**: Architecture – Transaction Flows.	15
Unit V	**CDMA and 3G**: Spread spectrum technology. **IS 95**: Speech and Channel Coding – Architecture – Channel Structure. CDMA vs. GSM – Wireless Data. **3G:** IMT & CDMA 2000 – Applications on 3G. **WIRELESS LAN:** Advantages – IEEE 802.11 standards - Types – 802.11 Architecture – Mobility – Deploying – Mobile Ad Hoc networks and sensor networks – Security – WiFi vs. 3G. **4G & 5G:** Introduction - Architecture.	14
	Total Contact Hrs.	**75**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(Role Play)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Asoke K Talukder, Roopa R Yavagal	Mobile Computing	TMH	2005

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Jochen Schiller	Mobile Communication	Second Edition, Asia	2008
2	Christoffer Andersson	GPRS and 3G Wireless Applications	John Wiley and son's pub.	2001
3	**Web Reference** https://www.tutorialspoint.com/mobile_computing/index.htm https://www.javatpoint.com/mobile-computing			

Course Designed by	Mr. R.Sekar	
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil. Head, Dept. of Information Technology NGM College (Autonomous) POLLACHI - 642 001
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT516			Title	Batch:	2026 - 2029
				CC Lab. – VI: Open Source Methodologies	Semester:	V
Practical Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	2

Course Objective

To obtain the practical knowledge about Open Source Methodologies commands, Administrative, Normal Commands and Basic Android Applications.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To apply the concepts of GNOME, shell and SDK.	PO1(2), PO2(2), PO3(2), PO4(1), PO5(3), PO6(2), PO8(1), PO10(3), PO11(1), PO13(1), PO15(1)
CO2	To analyze the various commands.	PO1(2), PO2(3), PO3(2), PO4(2), PO5(3), PO6(2), PO8(1), PO10(3), PO11(1), PO13(1), PO15(1)
CO3	To verify the results for the different input data.	PO1(2), PO2(3), PO3(2), PO4(3), PO5(2), PO6(2), PO8(1), PO10(3), PO11(2), PO13(1), PO15(2)
CO4	To create applications in Open Source Methodologies.	PO1(2), PO2(2), PO3(3), PO4(2), PO5(3), PO6(2), PO7(1), PO8(1), PO9(1), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To create various simple Android applications.	PO1(2), PO2(2), PO3(3), PO4(2), PO5(3), PO6(2), PO7(1), PO8(1), PO9(1), PO10(3), PO11(3), PO12(1), PO13(2), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	2	2	2	1	3	2	-	1	-	3	1	-	1	-	1
CO2	2	3	2	2	3	2	-	1	-	3	1	-	1	-	1
CO3	2	3	2	3	2	2	-	1	-	3	2	-	1	-	2
CO4	2	2	3	2	3	2	1	1	1	3	2	-	1	1	2
CO5	2	2	3	2	3	2	1	1	1	3	3	1	2	1	3

3 Point Scale – 1, 2, 3

Content	Hrs.
Sample Program List **Test I: Using GNOME, perform the following** 1. To Use Calculator, Calendar, Show Date And Time, System Info And Disk Usage 2. Create Directory and Add, Edit, Files, and Show the List. 3. To develop a program to Run The Odd Or Even Program Using C Or by Linux 4. Create List and view all the files using Icon. 5. Create an Archive file and Extract all Individual files from it. 6. Develop and Perform character Mapping. 7. Using Shell perform the following 1. Execute the File manipulation commands 2. Execute the Directory manipulation commands 3. Execute the Utility commands 4. Execute the Pipes & Filter commands 5. Backup Directory Using Tar **Test II :** Using Android SDK perform the following 1. Develop the phone dialer with the given number filled in. 2. Develop a Google search using Intent. 3. Create a Sending a text message and showing a picture (Using Extra Attributes). 4. Develop the Music player and play a song stored in SD card. 5. Create a simple Android Application.	75
Total Contact Hrs.	**75**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group Task.(GD)

Course Designed by	Mr. R.Sekar		
Verified by HOD	Mr. K. Vijayakumar		
Approved by Chairman Academic Council	Dr. R. Manickachezian		

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT517			Title	Batch:	2026 - 2029
				CC Lab. - VII: Full stack development	Semester:	V
Practical Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	2

Course Objective

To apply various concepts like string handling, mathematical functions, control structure and files in Python language and full stack development tool.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To deploy the list and tuple using control structures	PO1(3), PO2(1), PO3(2), PO4(2), PO5(2), PO6(1), PO8(2), PO10(3), PO11(2), PO13(1), PO15(2)
CO2	To examine need of files and its related functions	PO1(3), PO2(1), PO3(2), PO4(2), PO5(2), PO6(2), PO8(2), PO10(3), PO11(2), PO13(1), PO15(2)
CO3	To choose various packages suitable for the application	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(3), PO9(1), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO4	To verify the usage of various in built functions and packages	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(1), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(1), PO15(2)
CO5	To create an application using python and flask as a developing tool	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(3), PO12(1), PO13(2), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	2	2	2	1	-	2	-	3	2	-	1	-	2
CO2	3	1	2	2	2	2	-	2	-	3	2	-	1	-	2
CO3	3	2	3	3	3	2	1	3	1	3	2	-	1	1	2
CO4	3	2	3	3	3	3	1	3	2	3	2	-	2	1	2
CO5	3	3	3	3	3	3	2	3	2	3	3	1	2	2	3

3 Point Scale – 1, 2, 3

Content	Hrs.
SAMPLE PROGRAM LIST 1. Program to demonstrate basic Python concepts, input, operators, and mutable Vs immutable data types 2. Program to define and use functions with arguments and Python modules 3. Program to implement flow control statements (if, for, while) 4. Program to create, traverse, and perform operations on strings 5. Program to create, traverse, slice lists and perform matrix operations using nested lists 6. Program to create and manipulate dictionaries using methods and view objects 7. Program to demonstrate tuple creation and basic tuple operations 8. Program to perform pattern matching using Regular Expressions in Python 9. Program to read from and write data into files using Python file operations 10. Program to perform basic operations using NumPy arrays and Pandas Data Frames 11. Program to using NumPy and pandas libraries. 12. Program to create web application using flask.	**75**
Total Contact Hrs.	**75**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group Task(GD)

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi
Verified by HOD	Mr. K. Vijayakumar	K.V. JAYAKUMAR, MCA., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT5S1			Title	Batch:	2026 - 2029
				SEC III : Digital Content Development Lab. I	Semester:	V
Practical Hrs./Week	4	Tutorial Hrs./Sem.	-		Credits:	2

Course Objective

To Learn, Apply and create various editing techniques of Scribus.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To deploy basic tools for designing photos.	PO1(2), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(3), PO11(1), PO13(1), PO15(1)
CO2	To examine various editing tools.	PO1(2), PO2(1), PO3(2), PO4(2), PO5(2), PO6(1), PO8(2), PO10(3), PO11(1), PO13(1), PO15(1)
CO3	To choose manipulation of text with photos.	PO1(2), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO7(1), PO8(2), PO9(1), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO4	To verify filters and layers	PO1(2), PO2(1), PO3(2), PO4(2), PO5(2), PO6(2), PO7(1), PO8(2), PO9(1), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To create pdf document	PO1(2), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO7(1), PO8(2), PO9(1), PO10(3), PO11(2), PO12(1), PO13(1), PO14(1), PO15(2)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	2	1	1	1	1	-	-	1	-	3	1	-	1	-	1
CO2	2	1	2	2	2	1	-	2	-	3	1	-	1	-	1
CO3	2	2	2	2	2	1	1	2	1	3	2	-	1	1	2
CO4	2	1	2	2	2	2	1	2	1	3	2	-	1	1	2
CO5	2	2	2	2	2	1	1	2	1	3	2	1	1	1	2

Content	Hrs.
SCRIBUS **SAMPLE PROGRAM LIST** 1. Perform Scanning and simple image editing. 2. Apply Color change, image extraction and merging of images. 3. Create Smoothening of sharp edges. 4. Draw and Paint with Colors. 5. Placing a Photo inside Text. 6. Remove red eyes from a photo. 7. Apply Filters and layers. 8. Create a PDF-document from MS-Office-programs.	**60**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments ,Group Task (GD)

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi
Verified by HOD	Mr. K. Vijayakumar	K.V JAYAKUMAR, MCA., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT5S2			**Title**	**Batch:**	2026 - 2029
				SEC III : Digital Content Development Lab.II	**Semester:**	V
Practical Hrs./Week	4	**Tutorial Hrs./Sem.**	-		**Credits:**	2

Course Objective

To learn, apply and create various editing techniques of Canva.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To deploy basic tools for designing photos.	PO1(2), PO2(1), PO3(1), PO4(1), PO5(2), PO8(1), PO10(3), PO11(1), PO13(1), PO15(1)
CO2	To examine various editing tools.	PO1(2), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO8(2), PO10(3), PO11(1), PO13(1), PO15(1)
CO3	To choose manipulation of text with photos.	PO1(2), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO7(1), PO8(2), PO9(1), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO4	To verify filters and layers	PO1(2), PO2(2), PO3(2), PO4(2), PO5(2), PO6(2), PO7(1), PO8(2), PO9(1), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To create PDF document	PO1(2), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO7(1), PO8(2), PO9(1), PO10(3), PO11(2), PO12(1), PO13(1), PO14(1), PO15(2)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	2	1	1	1	2	-	-	1	-	3	1	-	1	-	1
CO2	2	2	2	2	2	1	-	2	-	3	1	-	1	-	1
CO3	2	2	2	2	2	1	1	2	1	3	2	-	1	1	2
CO4	2	2	2	2	2	2	1	2	1	3	2	-	1	1	2
CO5	2	2	2	2	2	1	1	2	1	3	2	1	1	1	2

3 Point Scale – 1, 2, 3

Content	Hrs.
CANVA **SAMPLE PROGRAM LIST** 1. Perform Scanning and simple image editing. 2. Apply Color change, image extraction and merging of images. 3. Create Smoothening of sharp edges. 4. Draw and Paint with Colors. 5. Placing a Photo inside Text. 6. Remove red eyes from a photo. 7. Apply Filters and layers. 8. Create a PDF-document from MS-Office-programs.	**60**
Total Contact Hrs.	**60**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments ,Group Task (GD)

Course Designed by	Mr. R.Sekar	
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil. Head,Dept. of Information Technology NGM College (Autonomous) POLLACHI - 642 001
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT5AL			**Title**	**Batch:**	2026 - 2029
				ALC - I Cyber Law (Optional) – Self Study	**Semester:**	V
Lecture Hrs./Week	SS	**Tutorial Hrs./Sem.**	-		**Credits:**	2**

Course Objective

To cultivate knowledge on Technical aspects of Cyber Security and Evidence Aspects and to acquire knowledge on Information Technology Act and EDI

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To remember the concepts of cyber law and cyber space	PO1(3), PO2(2), PO3(1), PO4(1), PO5(1), PO6(1), PO8(3), PO9(2), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To understand cyber security technical aspects	PO1(3), PO2(3), PO3(2), PO4(2), PO5(2), PO6(2), PO8(2), PO9(2), PO10(2), PO11(1), PO13(1), PO15(1)
CO3	To apply different types of technical evidence aspects	PO1(3), PO2(3), PO3(3), PO4(2), PO5(2), PO6(2), PO7(1), PO8(2), PO9(2), PO10(2), PO11(2), PO13(1), PO14(1), PO15(2)
CO4	To evaluate the electronic data interchange scenario	PO1(3), PO2(3), PO3(2), PO4(3), PO5(2), PO6(2), PO7(1), PO8(3), PO9(2), PO10(2), PO11(2), PO13(2), PO14(1), PO15(2)
CO5	To determine information technology act	PO1(3), PO2(3), PO3(2), PO4(3), PO5(2), PO6(3), PO7(2), PO8(3), PO9(2), PO10(2), PO11(2), PO12(1), PO13(2), PO14(1), PO15(2)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	1	-	3	2	2	1	-	1	-	1
CO2	3	3	2	2	2	2	-	2	2	2	1	-	1	-	1
CO3	3	3	3	2	2	2	1	2	2	2	2	-	1	1	2
CO4	3	3	2	3	2	2	1	3	2	2	2	-	2	1	2
CO5	3	3	2	3	2	3	2	3	2	2	2	1	2	1	2

3 Point Scale – 1, 2, 3

Units	Content
Unit I	Cyber Law: Introduction- Concept of Cyberspace-E-Commerce in India-Privacy factors in E - Commerce-cyber law in E-Commerce-Contract Aspects.
Unit II	Security Aspects: Introduction-Technical aspects of Encryption-Digital Signature-Data Security. Intellectual Property Aspects: WIPO-GII-ECMS-Indian Copy rights act on soft propriety works Indian Patents act on soft propriety works.
Unit III	Evidence Aspects: Evidence as part of the law of procedures –Applicability of the law of Evidence on Electronic Records-The Indian Evidence Act1872.Criminal aspect: Computer Crime-Factors influencing Computer Crime- Strategy for prevention of computer crime Amendments to Indian Penal code 1860.
Unit IV	Global Trends- Legal frame work for Electronic Data Interchange: EDI Mechanism-Electronic Data Interchange Scenario in India
Unit V	The Information Technology Act 2000-Definitions-Authentication Of Electronic Records Electronic Governance-Digital Signature Certificates.

Pedagogy and Assessment Methods:

Test, Quiz, Assignments

Text Books:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Suresh T.Viswanathan	The Indian Cyber Law	3rd Edition: Bharat Law House, New Delhi.	2022

Reference Books:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Pavan Duggal	Cyber Law: The Indian Perspective	Bharat Law House	2020
3	**Web Reference** https://www.youtube.com/watch?v=KtuCsBlJXk8 https://www.youtube.com/watch?v=SCgc55vtd6M			

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head,Dept. of Information Technology NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT618			**Title**	**Batch:**	2026 - 2029
				CC – XI : Visual Programming	**Semester:**	VI
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	5		**Credits:**	4

Course Objective

To understand the various concepts of C#.Net and MVC Controllers

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To recall various statements, structure of C#.Net , data types, Methods, properties, Indexes, Overloading, Inheritance and polymorphism etc.	PO1(3), PO2(1), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To Understand the basic Namespaces and Components, Delegates, Events and Attributes. I/O Streams	PO1(3), PO2(2), PO3(2), PO4(2), PO5(2), PO6(1), PO8(2), PO10(3), PO11(2), PO13(1), PO15(2)
CO3	To make use of the various controls of OOPs, Windows Applications and Web Services.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(1), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To analyze MVC Controllers and concepts.	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To prove the concepts into the Lab. Programs using C#.net and MVC Controllers.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO12(1), PO13(2), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	2	2	2	2	1	-	2	-	3	2	-	1	-	2
CO3	3	2	3	3	3	3	2	3	1	3	2	-	2	2	2
CO4	3	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	3	3	3	3	2	2	3	2	3	2	1	2	2	3

Units	Content	Hrs. L+T
Unit I	**Visual C#.Net:** Introduction - Features – Data types and console I/O. Methods: (value, ref, out, params). Properties, Indexes and Operator Overloading: Introduction – Properties – Indexes – Operator overloading – Conversion operators.Inheritance and Polymorphism: Virtual methods – Abstract Classes and Abstract Methods – Sealed classes.	**14+1**
Unit II	Namespaces and Components – Namespaces – Components – Components and Namespaces – Access modifiers. Delegates, Events and Attributes. I/O Streams: Introduction – Streams – Binary Data files – Text files – Data files – File and Directory Operations.	**14+1**
Unit III	Windows applications - I. Windows applications-II. Database connectivity. Basic Web controls. Validation and list web controls: Introduction – validation – list. User and Custom web controls: Introduction – User controls – controls and custom properties, controls. Web services: Introduction – concepts – creation – Creating a web service that use data source.	**14+1**
Unit IV	Model-View-Controller: Overview-Pattern-Environment- Getting Starting-Life Cycle-Routing-Controllers-Actions-Filters-Selectors-Views-Data Model-Model Building-Database-Validation-System Requirements.	**14+1**
Unit V	Case Study: MVC controller handling a request to fetch a Book detail MVC controller handling a request to Car Rental System MVC controller handling a request to Health Care Management System MVC controller handling a request to Financial Services Applications MVC controller handling a request to Employee Payroll System MVC controller handling a Basic CRUD (Create, Read, Update, Delete) application	**14+1**
	Total Contact Hrs.	**70+5**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(GD/ Role Play /APS)

Text Book:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Muthu. C	Visual C#.Net	First Reprint. Tata Mc-Graw Hill Pub.	2008

Reference Books:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Kogent learning solutions	ASP.NET 4.0 in Simple Steps	Dream Tech Press Publication	2011
2	Padmapriya .S	Web Technology	- Scitech Publications	2011
3	**Web Reference** https://learn.microsoft.com/en-us/aspnet/mvc/overview/getting-started/introduction/getting-started https://www.tutorialspoint.com/asp.net_mvc/index.htm https://help.syncfusion.com/aspnetmvc/system-requirements			

Course Designed by	Mr. R.Sekar	
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT6E4			Title	Batch:	2026 - 2029
				DSE – II : Machine Learning	Semester:	VI
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

To give a better understanding of various concepts of Data machine learning, evaluation models generated from data a build machine learning algorithms, prepare data, and use different techniques using Python

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To remember the concept of Machine learning techniques andmathematical concepts in ML	PO1(3), PO2(2), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	Understand a wide variety of learning algorithms.	PO1(3), PO2(3), PO3(2), PO4(2), PO5(2), PO6(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO3	Understand how to evaluate models generated from data	PO1(3), PO2(3), PO3(3), PO4(2), PO5(2), PO6(2), PO8(1), PO10(2), PO11(2), PO13(1), PO14(1), PO15(2)
CO4	Provide a way to evaluate performance of machine learningalgorithms.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(2), PO6(2), PO7(1), PO8(1), PO9(1), PO10(2), PO11(2), PO13(2), PO14(1), PO15(2)
CO5	Apply the algorithms to a real-world problem and optimize themodels learned.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(1), PO9(1), PO10(2), PO11(3), PO12(1), PO13(2), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	3	2	2	2	1	-	1	-	2	1	-	1	-	1
CO3	3	3	3	2	2	2	-	1	-	2	2	-	1	1	2
CO4	3	3	3	3	2	2	1	1	1	2	2	-	2	1	2
CO5	3	3	3	3	3	2	1	1	1	2	3	1	2	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs
Unit I	Introduction: Machine Learning Foundations – Overview – Design of a Learning System – Types of Machine Learning –Supervised Learning and Unsupervised Learning – Applications of Machine Learning - Overview of Tools for ML.	15
Unit II	Supervised Learning – I: Simple Linear Regression – Multiple Linear Regression – Polynomial Regression – Ridge Regression – Lasso Regression – Evaluating Regression Models – Model Selection – Bagging – Ensemble Methods.	16
Unit III	Supervised Learning – II: Classification – Logistic Regression – Decision Tree Regression and Classification – Random Forest Regression and Classification – Support Vector Machine Regression and Classification – Evaluating Classification Models.	15
Unit IV	Unsupervised Learning: Clustering – K-Means Clustering – Density-Based Clustering – Dimensionality Reduction – Collaborative Filtering.	15
Unit V	Association Rule Learning: Association Rule Learning – Concepts related to ARL – ARL Algorithms - Apriori – Eclat – Concepts andAlgorithms.	14
	Total Contact Hrs	**75**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(GD/ Role Play /APS)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Kevin P.Murphy	Machine Learning: A Probabilistic Perspective	MIT Press	2012

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Ethem Alpaydin	Introduction to Machine Learning	MIT Press,Third Edition	2014
2	Sebastian Raschka, Vahid Mirjilili	Python Machine Learning and deep learning, kindle book	2nd Edition	2018
3	**Web Reference** https://www.youtube.com/watch?v=bk12t0Xz5FM https://www.youtube.com/watch?v=i_LwzRVP7bg			

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head, Dept. of Information Technology NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT6E5			Title	Batch:	2026 - 2029
				DSE – II : Internet of Things	Semester:	VI
Lecture Hrs./Week:	5	Tutorial Hrs./Sem.:	-		Credits:	4

Course Objective

Understand about the definition and usage of Internet of things and the key components of IoT system

Course Outcome

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To remember the various concepts of IoT.	PO1(3), PO2(2), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To Understand the basic concepts of M2M and sensors	PO1(3), PO2(3), PO3(2), PO4(2), PO5(2), PO6(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO3	To apply the concepts into the embedded devices	PO1(3), PO2(3), PO3(3), PO4(2), PO5(3), PO6(2), PO7(1), PO8(1), PO9(1), PO10(2), PO11(2), PO13(1), PO14(1), PO15(2)
CO4	To analyze the various privacy issues.	PO1(3), PO2(3), PO3(2), PO4(3), PO5(2), PO6(3), PO7(1), PO8(2), PO9(1), PO10(2), PO11(2), PO13(2), PO14(1), PO15(2)
CO5	To evaluate software design for IoT applications	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(2), PO9(1), PO10(2), PO11(3), PO12(1), PO13(2), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	3	2	2	2	1	-	1	-	2	1	-	1	-	1
CO3	3	3	3	2	3	2	1	1	1	2	2	-	1	1	2
CO4	3	3	2	3	2	3	1	2	1	2	2	-	2	1	2
CO5	3	3	3	3	3	3	2	2	1	2	3	1	2	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**IoT:** Overview – Introduction – Conceptual Framework – Architectural View – Technology Behind – Sources – M2M Communication – Examples.	14
Unit II	**Design Principles for Connected Devices:** Introduction – IoT/M2M Systems Layers and Design Standardization – Communication Technologies – Data Enrichment, Consolidation and Device Management at Gateway – Designing and Affordability.	14
Unit III	**Data Acquiring, Organizing, Processing and Analytics:** Introduction – Data Acquiring and Storage – Organizing the data – Transactions, Business Processes, Integration and Enterprise Systems – Analytics – Knowledge Acquiring, Managing and Storing Processes.	15
Unit IV	**Sensors, Participatory Sensing, RFIDs, and Wireless Sensor Networks:** Introduction – Sensor Technology – Participatory Sensing, Industrial and Automotive IoT – Actuator – Sensor Data Communication Protocols – RF Identification Technology – Wireless Sensor Network Technology.	16
Unit V	**Prototyping and Designing the Software for IoT Applications:** Introduction – Prototyping Embedded Device Software – Devices, Gateways, Internet and Web/Cloud Services Software Development – Prototyping Online Component APIs and Web APIs. **IoT Privacy, Security and Vulnerabilities Solutions:** Introduction – Vulnerabilities, Security Requirements and Threat Analysis – IoT Security Tomography and Layered Attacker Model – Security Models, Profiles and Protocols.	16
	Total Contact Hrs.	**75**

Pedagogy and Assessment Methods:

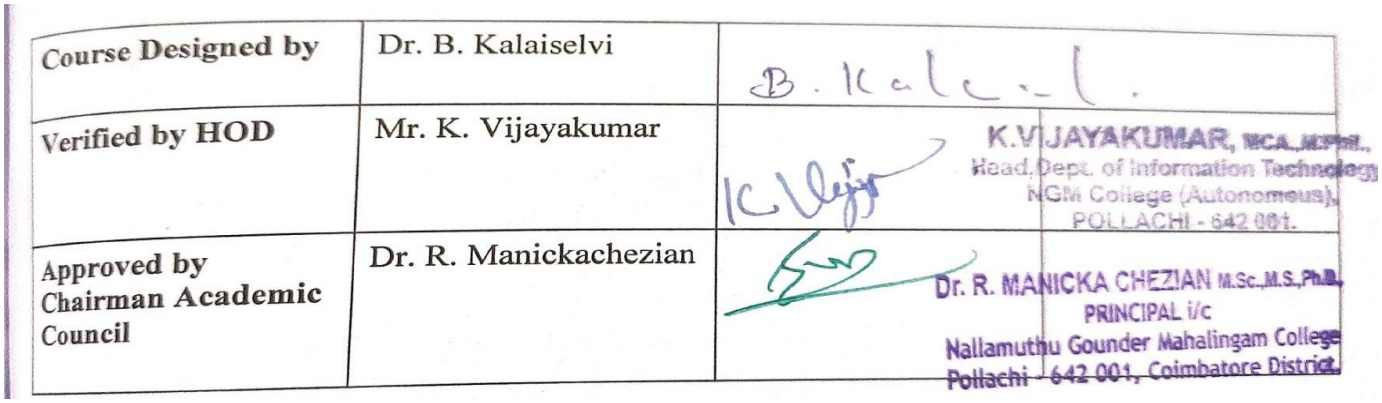
Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(GD)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Raj Kamal	Internet of Things Architecture and Design Principle	4th Reprint, McGraw Hill Education	2019

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Vijay Madisetti and ArshdeepBahga	Internet of Things (A Hands-on-Approach)	1st Edition, VPT	2014
2	Margolis, Michael	Arduino Cookbook: Receipesto begin, Expand and Enhance Your Projects	O'Reilly Media Inc	2011
3	Monk, Simon. Raspberry Pi	Cookbook: Software and hardware problems and Solutions	O'Reilly Media Inc	2016
4	**Web Reference** https://onlinecourses.swayam2.ac.in/aic20_sp06/preview https://onlinecourses.swayam2.ac.in/arp19_ap79/preview			



Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT6E6			Title	Batch:	2026 - 2029
				DSE – II : Digital Marketing	Semester:	VI
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	--		Credits:	4

Course Objective

To learn E-Business revenue models, E-marketing, E-security, CRM, online payment systems and sales.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To remember basic concepts of Digital Marketing	PO1(3), PO2(2), PO3(1), PO4(1), PO5(1), PO8(2), PO9(1), PO10(3), PO11(1), PO13(1), PO15(1)
CO2	To understand the role of E-marketing, E-security, E-payment systems in current scenario	PO1(3), PO2(3), PO3(2), PO4(2), PO5(2), PO6(3), PO8(2), PO9(2), PO10(3), PO11(1), PO13(1), PO15(1)
CO3	To apply mobile payments.	PO1(2), PO2(2), PO3(3), PO4(2), PO5(3), PO6(2), PO7(1), PO8(2), PO9(2), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO4	To analyze various portals associated with e-commerce	PO1(2), PO2(3), PO3(2), PO4(3), PO5(2), PO6(2), PO7(1), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(1), PO15(2)
CO5	To justify legal and ethical issues in digital economy and phishing	PO1(3), PO2(3), PO3(2), PO4(3), PO5(2), PO6(3), PO7(2), PO8(3), PO9(2), PO10(2), PO11(2), PO12(1), PO13(2), PO14(1), PO15(2)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	-	-	2	1	3	1	-	1	-	1
CO2	3	3	2	2	2	3	-	2	2	3	1	-	1	-	1
CO3	2	2	3	2	3	2	1	2	2	3	2	-	1	1	2
CO4	2	3	2	3	2	2	1	3	2	3	2	-	2	1	2
CO5	3	3	2	3	2	3	2	3	2	2	2	1	2	1	2

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**e-Commerce:** Introduction- Early Business information interchange efforts – Emergence of the internet – Milestones – **Advantages – Disadvantages* – Online extension of BAM model – Transition to e-commerce in India – E-transition challenges for Indian corporate. **Business Models**: Introduction – E-Business models based on the relationship of transaction parties and transaction types.	15
Unit II	**E-Marketing:** Traditional Marketing – Identifying web presence goals – Online marketing – E-Advertising – Internet marketing trends – Target Markets – Marketing strategies.	14
Unit III	**E-Security:** Information system security – **Security on the internet*. **E-Payment Systems:** Internet Banking – Digital payment requirements – Digital token based e-payment systems – Classification of new payment systems – Electronic cash – Risk and e-Payment system – Online financial services in India – Online stock trading.	15
Unit IV	**E-customer Relationship Management:** CRM – Typical Business Touch Points. **E-supply Chain Management:** CISCO – supply chain. **Information Systems for Mobile Commerce:** Introduction – Mobile payments – Mobile Commerce in India.	15
Unit V	**Portals for E-Business: ****Portals* – Requirements of intelligent websites – portals for mass collaborations – portals for Enterprise Resource Planning – ERP – Intranet Portals – HRM – Various HRIS modules. **Legal and Ethical Issues:** Ethical issues in Digital economy – cyber stalking – Phishing – Application fraud – Skimming – Copyright – Internet Gambling – Threats to children – Special Nature of Computer Ethics.	16
	Total Contact Hrs.	75

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments, Group Task.(GD/ Role Play /APS)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	P. T. Joseph S. J	E - Commerce: An Indian Perspective	5th Edition, PHI	2017

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Henry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang	E-commerce Fundamentals and Applications	1st Edition, Wiley India Pvt Ltd	2011
2	Gary P Schneider	E-Commerce Strategy, Technology And Implementation	9th Edition, Engage Learning Pub.	2012
3	**Web Reference** https://www.slideshare.net/sajidkhetani/digital-payments-india-perspective https://www.sampletemplates.com/marketing-templates/digital-marketing- presentation.html			

Course Designed by	Ms. V. Prabavathi	V. Prabavathi.	
Verified by HOD	Mr. K. Vijayakumar		AKUMAR, MCA.,M.Phil., of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian		Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT6E7			Title	Batch:	2026 - 2029
				DSE - III: Big Data Analytics	Semester:	VI
Lecture Hrs./Week	6	Tutorial Hrs./Sem.	-		Credits:	5

Course Objective

To cultivate knowledge about big data analytics, technologies and to transform the business using Analytics.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To remember the fundamentals of Big Data.	PO1(3), PO2(2), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To understand the concepts of Hadoop	PO1(3), PO2(3), PO3(2), PO4(2), PO5(3), PO6(2), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO3	To apply different types of Analytics	PO1(3), PO2(3), PO3(3), PO4(2), PO5(3), PO6(2), PO7(1), PO8(1), PO9(1), PO10(2), PO11(2), PO13(1), PO14(1), PO15(2)
CO4	To evaluate the results and transform the business	PO1(3), PO2(3), PO3(3), PO4(3), PO5(2), PO6(2), PO7(1), PO8(2), PO9(1), PO10(2), PO11(3), PO13(2), PO14(1), PO15(2)
CO5	To improve business through social media analysis	PO1(3), PO2(3), PO3(2), PO4(3), PO5(2), PO6(2), PO7(2), PO8(2), PO9(2), PO10(2), PO11(3), PO12(1), PO13(2), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	3	2	2	3	2	-	1	-	2	1	-	1	-	1
CO3	3	3	3	2	3	2	1	1	1	2	2	-	1	1	2
CO4	3	3	3	3	2	2	1	2	1	2	3	-	2	1	2
CO5	3	3	2	3	2	2	2	2	2	2	3	1	2	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**Types Of Digital Data**: classification of digital data. **Introduction to Big Data**: Characteristics– Evolution – Definition – Challenges – Big Data Definition – Other Characteristics – Need of Big Data – Traditional Business Intelligence Versus Big Data – Data Warehouse Environment – Hadoop Environment – Big Data Today – Changing Realms Of Big Data. **Big Data Analytics**: Big Data Analytics – Classification Of Analytics – Greatest Challenges – Top Challenges – Importance – Kind Of Technologies to Meet The Challenges – Data Science – Data Scientist – Terminologies used in Big Data – BASE – Analytics Tools	**19**
Unit II	**The Big Data Technology Landscape**: NoSQL – Hadoop. **Introduction to Hadoop**: Introduction – Need- RDBMS Versus Hadoop – Distributed Computing Challenges – History – Overview – Use case – Distributors – HDFS – Processing Data with Hadoop – Managing Resources And Applications With Hadoop YARN – Interacting With Hadoop Ecosystem- **Few Interesting Differences.**	**18**
Unit III	**Apply Analytics :** Evolution of analytics-Text analytics-Speech analytics-Video/image analytics-Behavior analytics-Combined analytics-Transparency-Prediction vs. privacy	**17**
Unit IV	**Report Results :** Data visualization-New data visualization-Displaying behavior & emotions-Displaying connections-How to improve data visualization-Info graphics - Beware the self-service business intelligence tools-The ingredients of successful data visualization and info graphics - Management dashboards	**18**
Unit V	**Foundation for Social Media Analytics:** Foundation for Analytics: – Digital Gap – Social Media Data Sources – Defining Social Media Data –Data Sources – Estimated vs. Factual Data Sources – Data Gathering in Social Media Analytics. From Data to Insights: Actionable Analytics – Focus on objective – Plan to shape data to insights – Choosing a good analytics tool – Data Aggregation calculations and display – Data display – Social-Media and Big data – Potential Challenges. Data Identification: Professional networking sites - social sites – information sharing sites – micro blogging sites – blogs /wikis	**18**
	Total Contact Hrs.	**90**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, Test, Seminar, Quiz, Assignments

Text Books:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Seema Acharya, Submachine Chellapan	Big Data and Analytics	2nd Edition, Wiley Publications	2019
2	Bernard Marr	Big data : using smart big data, analytics and metrics to make better decisions and improve performance	Wiley Publications	2015
3	Alex Goncalves, Social Media Analytics Strategy	Using Data to Optimize Business Performance	Alex Goncalves, APress	2017

Reference Books:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	M. Vijayalakshmi Radha Shankarmani	Big Data Analytics	KindleEdition,Wiley Publications	2016
2	Peter Mika	Social Networks and the Semantic Web	First Edition, Springer	2007
3	**Web Reference** https://www.simplilearn.com/what-is-big-data-analytics-article https://searchbusinessanalytics.techtarget.com/definition/big-data-analytics https://www.youtube.com/watch?v=bY6ZzQmtOzk			

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT6E8			Title	Batch:	2026 - 2029
				DSE - III: Artificial Intelligence	Semester:	VI
Lecture Hrs./Week	6	Tutorial Hrs./Sem.	-		Credits:	5

Course Objective

To embed a deep knowledge about search techniques, reasoning, game playing, expert systems and prolog.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To Understand the nature of AI problems and task domains of AI	PO1(3), PO2(2), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To Apply the appropriate search procedures to solve the problems by using best algorithms.	PO1(3), PO2(3), PO3(3), PO4(2), PO5(2), PO6(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO3	To Analyze and select the suitable knowledge representation method.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(2), PO6(2), PO8(1), PO10(2), PO11(2), PO13(1), PO14(1), PO15(2)
CO4	To Manipulate the acquired knowledge and infer new knowledge.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(2), PO6(2), PO7(1), PO8(1), PO9(1), PO10(2), PO11(2), PO13(2), PO14(1), PO15(2)
CO5	To Demonstrate the development of AI systems by encoding the knowledge	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(1), PO9(1), PO10(2), PO11(3), PO12(1), PO13(2), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	3	3	2	2	1	-	1	-	2	1	-	1	-	1
CO3	3	3	3	3	2	2	-	1	-	2	2	-	1	1	2
CO4	3	3	3	3	2	2	1	1	1	2	2	-	2	1	2
CO5	3	3	3	3	3	2	1	1	1	2	3	1	2	1	3

3 Point Scale – 1, 2, 3

Units	Content	Hrs.
Unit I	**Introduction:** Artificial Intelligence-Foundations-History-State of the Art. **Intelligent Agents**: Agents and Environment – Good Behaviour: The concept of Rationality – The Nature of Environments – Structure of Agents.	19
Unit II	**Solving problems by searching:** Problem Solving Agents – Example problems – **Searching for solutions:** Infrastructure for search algorithms – Measuring problem-solving performance. **Uninformed Search Strategies:** Breadth-first Search-Uniform cost Search – Depth-First search-Depth limited search- Iterative depending depth first search – Bidirectional search. I**nformed Search Strategies:** Greedy best-first search.	16
Unit III	**Logical agents:** Knowledge based agents – The Wumpus world – logic – Propositional Logic: A very simple logic. **Knowledge Representation:** Ontological Engineering – Categories and objects – Events.	18
Unit IV	**Learning from examples: Forms of Learning**- Supervised Learning – Learning Decision Trees – Evaluating and Choosing the Best Hypothesis – The theory of Learning – Regression and Classification – Artificial Neural Networks – Non Parametric Models – Support Vector Machines – Ensemble Learning – Practical Machine Learning.	18
Unit V	**Natural Language Processing** – Language Models – Text Classification – Information Retrieval – Information Extraction. **Robotics:** Introduction – Robot Hardware – Robotic Perception – Planning to Move – Planning Uncertain Movements – Moving – Robotic Software Architecture – Application Domains.	19
	Total Contact Hrs.	90

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Flipped Class, est, Seminar, Quiz, Assignments, Group Task.(GD/ Role Play /APS)

Text Book

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Stuart Russell, Peter Norvig	Artificial Intelligence: A Modern Approach	3rd Edition, Pearson New International Edition.	2009

Reference Books

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Elaine Rich, Kevin Knight	Artificial Intelligence	3rd edition, Tata McGraw Hill Publications	2009
2	Michael Negnevitsky	Artificial Intelligence	3rd edition, Pearson India Education services PVT. Ltd	2020
3	Er. Rajiv Chopra	Artificial Intelligence: A Practical Approach	1st Edition, S. Chand Publications.	2005
4	**Web Reference** https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_expert_systems.htm https://www.geektonight.com/artificial-intelligence-pdf			

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi
Verified by HOD	Mr. K. Vijayakumar	K.V. JAYAKUMAR, MCA., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT6E9			Title	Batch:	2026 - 2029
				DSE - III Block Chain Technology	Semester:	VI
Lecture Hrs/Week:	6	Tutorial Hrs./ Sem.	-		Credits:	5

Course Objective

To understand the fundamentals of block chain and crypto currency, influence and role of block chain in various fields.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To keep in mind the fundamentals of block chain technology and crypto currency	PO1(3), PO2(2), PO3(1), PO4(1), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To understand the mining mechanism in block chain.	PO1(3), PO2(3), PO3(2), PO4(2), PO5(2), PO6(2), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO3	To apply and identify security measures, and various types of services that allow people to trade and transact with bit coin.	PO1(3), PO2(3), PO3(3), PO4(2), PO5(3), PO6(3), PO7(1), PO8(2), PO9(1), PO10(2), PO11(2), PO13(1), PO14(1), PO15(2)
CO4	To analyze security, privacy, and efficiency of a given Block chain system.	PO1(3), PO2(3), PO3(3), PO4(3), PO5(2), PO6(3), PO7(1), PO8(2), PO9(1), PO10(2), PO11(2), PO13(2), PO14(1), PO15(2)
CO5	To explain the Block chain technology in various fields.	PO1(3), PO2(3), PO3(2), PO4(3), PO5(2), PO6(2), PO7(2), PO8(2), PO9(2), PO10(2), PO11(3), PO12(1), PO13(2), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	-	-	1	-	2	1	-	1	-	1
CO2	3	3	2	2	2	2	-	1	-	2	1	-	1	-	1
CO3	3	3	3	2	3	3	1	2	1	2	2	-	1	1	2
CO4	3	3	3	3	2	3	1	2	1	2	2	-	2	1	2
CO5	3	3	2	3	2	2	2	2	2	2	3	1	2	1	3

3 Point Scale – 1, 2, 3

26UIT6E9

Units	Content	Hrs.
Unit I	**Introduction to Block chain**: The big picture of the industry – size, growth, structure, players. Bitcoin versus Crypto currencies versus Block chain - Distributed Ledger Technology (DLT). Strategic analysis of the space – Block chain platforms, regulators, application providers. The major application: currency, identity, chain of custody.	**18**
Unit II	**Network and Security:** Advantage over conventional distributed database, Block chain Network, Mining Mechanism, Distributed Consensus, Block chain 1.0, 2.0 and 3.0 – transition, advancements and features. Privacy, Security issues in Block chain.	**19**
Unit III	**Crypto currency:** Crypto currency - History, Distributed Ledger, Bit coin protocols - Symmetric-key cryptography - Public-key cryptography - Digital Signatures -High and Low trust societies - Types of Trust model: Peer-to-Peer, Leviathan, and Intermediary. Application of Cryptography to Block chain.	**19**
Unit IV	**Crypto currency Regulation:** Crypto currency Regulation - Stakeholders, Roots of Bit coin, Legal views - exchange of crypto currency - Black Market - Global Economy. Crypto-economics – assets, supply and demand, inflation and deflation – Regulation.	**18**
Unit V	**Challenges in Block Chain:** Opportunities and challenges in Block Chain – Application of block chain: Industry 4.0 – machine to machine communication – Data management in industry 4.0 – future prospects. Block chain in Health 4.0 – Block chain properties - Healthcare Costs - Healthcare Quality - Healthcare Value - Challenges for using block chain for healthcare data.	**16**
	Total Contact Hrs.	90

Pedagogy and Assessment Methods:

Digital Presentation, Chalk and talk, Flipped class, Seminar, Assignment, Group task

Text Books:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder	Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction	Princeton University Press.	2016
2	Antonopoulos	Mastering Bitcoin: Unlocking Digital Cryptocurrencies	O'Reilly Media,Inc	2014

Reference Books:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Satoshi Nakamoto	Bitcoin: A Peer-to-Peer Electronic Cash System	--	2008
2	Rodrigo da Rosa Righi, Antonio Marcos Alberti, Madhusudan Singh	Block chain Technology for Industry 4.0	Springer	2020
3	**Web Reference** https://www.slideshare.net/Mithileysh/blockchain-technology-181440314 https://www.slideshare.net/asrithak/blockchain-technology-ppt			

Course Designed by	Mr. R.Sekar	
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT619			Title	Batch:	2026 - 2029
				CC Lab - VIII : Software Testing & Data Visualization Tools	Semester:	VI
Practical Hrs./Week	6	Tutorial Hrs./Sem.	--		Credits:	3

Course Objective

To gain the knowledge to apply the various programming concepts of Software testing like integration, unit, functional, non-functional testing and also to learn about Data visualization tools

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To make use of properties for checking the values	PO1(2), PO2(2), PO3(2), PO4(2), PO5(3), PO6(2), PO8(1), PO10(3), PO11(1), PO13(1), PO15(1)
CO2	To justify the expected result with the obtained result.	PO1(2), PO2(3), PO3(2), PO4(3), PO5(2), PO6(2), PO8(1), PO10(3), PO11(2), PO13(1), PO15(2)
CO3	To create GUI based database applications to test	PO1(2), PO2(2), PO3(3), PO4(2), PO5(3), PO6(2), PO7(1), PO8(1), PO9(1), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO4	To design different chats for data visualization	PO1(2), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(1), PO9(1), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO5	To Analyse the data from different perspectives using various charts	PO1(2), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(2), PO9(1), PO10(3), PO11(3), PO12(1), PO13(2), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	2	2	2	2	3	2	-	1	-	3	1	-	1	-	1
CO2	2	3	2	3	2	2	-	1	-	3	2	-	1	-	2
CO3	2	2	3	2	3	2	1	1	1	3	2	-	1	1	2
CO4	2	2	3	3	3	2	1	1	1	3	2	-	1	1	2
CO5	2	3	3	3	3	2	1	2	1	3	3	1	2	1	3

3 Point Scale – 1, 2, 3

Content	Hrs.
SAMPLE PROGRAM LIST **Test I:** **Using Data Visualization Tool** 1. Using the Data sheet, create a vertical bar chart of the main sources of household light in a region. 2. Using Data sheet, create a stacked bar chart of each district's main sources of cooking fuel. 3. Once again using Data sheet, create a pie chart of the main sources of household light in a particular region. **Using Selenium** 1. Write a simple test program that will launch Firefox browser and open "www.google.com". 2. Write a simple test program that will launch Google chrome browser and open "www.ngmc.org " and then search Department of Information Technology . 3. Write a simple test program that will launch Firefox browser and open "www.gmail.com". **Test II: Using Selenium** 4. Write a simple test program that will launch Google chrome browser and open "www.amazon.com".and then search mobile accessories list. 5. Write a simple test program that will launch Firefox browser and open "www.yahoo.com"and then search yahoo mail. **Using Data Visualization Tool** 4. Using the Data sheet, create a line graph of the infant mortality rate in a particular region. 5. Using the Data sheet, create a scatter plot of the relationship between illiterate population and marginal workers for Indian towns. 6. Create a word cloud of the incident locations in India between 1997 and 2015.	90
Total Contact Hrs.	**90**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group Discussion

Course Designed by	Ms. V. Prabavathi	V. Prabavathi.	
Verified by HOD	Mr. K. Vijayakumar	K. Vijay	YAKUMAR, MCA.,M.Phil., of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian		Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT620			**Title**	**Batch:**	2026 - 2029
				CC Lab - IX : Visual Programming	**Semester:**	VI
Practical Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	2

Course Objective

To understand the practical experience in various concepts of C#.Net and MVC Controllers

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To experiment the concepts of C#.net	PO1(3), PO2(1), PO3(1), PO4(2), PO5(1), PO8(1), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To motivate to create a program for basic manipulations	PO1(3), PO2(2), PO3(2), PO4(3), PO5(2), PO6(1), PO7(1), PO8(2), PO10(3), PO11(2), PO13(1), PO14(1), PO15(2)
CO3	To create applications using Controls	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(1), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO4	To Test the Controls using MVC Controller	PO1(3), PO2(2), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO13(2), PO14(2), PO15(2)
CO5	To design the MVC Controller for applications	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(2), PO8(3), PO9(2), PO10(3), PO11(2), PO12(1), PO13(2), PO14(2), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	1	2	1	-	-	1	-	2	1	-	1	-	1
CO2	3	2	2	3	2	1	1	2	-	3	2	-	1	1	2
CO3	3	2	3	3	3	2	2	3	1	3	2	-	2	2	2
CO4	3	2	3	3	3	3	2	3	2	3	2	-	2	2	2
CO5	3	3	3	3	3	2	2	3	2	3	2	1	2	2	3

3 Point Scale – 1, 2, 3

Content	Hrs.
Sample Program List **TEST I (C#.NET)** 1. Execute Switch Statement Display the employ details. 2. Create method overloading. 3. Create constructor overloading 4. Create student mark list using inheritance 5. Create User-Defined exception**.** 6. Create an application using button controls (check box, radio). 7. Generate Month calendar. 8. Create applications using controls (trackbar,panel,treeview), 9. Create applications using controls (splitter, menu dialog boxes). **TEST II** 10. Create MVC controller handling a request to fetch a Book detail 11. Create MVC controller handling a request to Car Rental System 12. Create MVC controller handling a request to Health Care Management System 13. Create MVC controller handling a request to Financial Services Applications 14. Create MVC controller handling a request to Employee Payroll System 15. Create MVC controller handling a Basic CRUD (Create, Read, Update, Delete) application	**75**
Total Contact Hrs.	**75**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group task (Group Discussion)

Course Designed by	Mr. R.Sekar	
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	26UIT621			Title	Batch:	2026 - 2029
				Project	Semester:	VI
Practical Hrs./Week:	-	Tutorial Hrs./Sem.	-		Credits:	3

Course Objective

To learn depth knowledge about tools used in software application development, web designing & web technologies and understand the usage of front end and back end tools.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To create database, tables, coding	PO1(3), PO2(2), PO3(3), PO4(2), PO5(3), PO6(1), PO8(1), PO10(3), PO11(2), PO13(1), PO15(2)
CO2	To apply the coding into System side	PO1(3), PO2(3), PO3(3), PO4(2), PO5(3), PO6(2), PO8(1), PO10(3), PO11(2), PO13(1), PO15(2)
CO3	To apply various tools in real time Applications/Software	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(1), PO9(1), PO10(3), PO11(3), PO13(2), PO14(1), PO15(2)
CO4	To analyze the system requirements of the Application /Software	PO1(3), PO2(3), PO3(2), PO4(3), PO5(2), PO6(2), PO7(1), PO8(2), PO9(1), PO10(3), PO11(3), PO13(2), PO14(1), PO15(2)
CO5	To verify the developed Application with the customer requirements	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(2), PO9(2), PO10(3), PO11(3), PO12(1), PO13(2), PO14(1), PO15(3)
CO6	Evaluate the Applications/Software through the stake holder	PO1(3), PO2(2), PO3(3), PO4(2), PO5(3), PO6(1), PO8(1), PO10(3), PO11(2), PO13(1), PO15(2)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	3	2	3	1	-	1	-	3	2	-	1	-	2
CO2	3	3	3	2	3	2	-	1	-	3	2	-	1	-	2
CO3	3	3	3	3	3	2	1	1	1	3	3	-	2	1	2
CO4	3	3	2	3	2	2	1	2	1	3	3	-	2	1	2
CO5	3	3	3	3	3	2	1	2	2	3	3	1	2	1	3

3 Point Scale – 1, 2, 3

Content
Using only the following Elective Tools (Not Limited to…) **Front end, Multimedia & Web based tools:** 1. Java & Advanced Java 2. Angular, FX & JavaScript 3. PHP 4. Python 5. C#.NET 6. HTML 5.0, CSS 7. Flash, 3D Max 8. JavaScript 9. Full Stack Development 10. DevOps **Back end tools:** 1. MySQL 2. Oracle 8i & above 3. MS Access 2007 4. SQL Server 2000 and Above **Note:** Project Internship (upto System Study – Criteria 1 (Evaluation - 5 Marks from Internal Marks)) going to fourth semester Vacation and submit their report on fifth semester.

INFORMATION TECHNOLOGY PROJECT and VIVA VOCE

Guidelines

Introduction

The title of the project work and the organization will be finalized at the end of the fifth Semester. Each student will be assigned with a Faculty for guidance. The Project work and coding will be carried by using the facility of the computer science lab as well as in the organization. The periodical review will be conducted to monitor the progress of the project work. The project report will be prepared and submitted at the end of the semester. An external examiner appointed by the Controller of Examination will conduct the viva voce examination along with a respective guide.

Area of Work

- Web Based Development
- Mobile app development
- Website development
- IoT Projects
- Big Data and Data Mining Projects
- Cloud Computing Projects
- Networking Projects
- Artificial Intelligence and Machine learning Projects
- Data Analytics Projects using Python, R, Tableau etc..
- System Software
- Web Security Projects
- Image Processing

Methodology

Arrangement of Contents:

The sequence in which the project report material should be arranged and bound as follows:

1. Cover Page & Title Page
2. Bonafide Certificates
3. Declaration
4. Acknowledgement
5. Synopsis
6. Table of Contents
7. Chapters
8. Appendix
9. References

Format of Table of Contents

TABLE OF CONTENTS

Chapter No.	Title	Page No.
i	Certificates	
ii	Declaration	
iii	Acknowledgement	
iv	Synopsis	
1.	Introduction	

1.1 Introduction
1.2 Objective of the Project
1.3 Company Profile
1.4 System Specification
1.4.1 Hardware Specification
1.4.2 Software Specification

2 System Study
2.1 Existing System
2.1.2 Drawbacks
2.2 Proposed System
2.3 Planning and Scheduling

3 System Design
3.1 Overview of the Project
3.2 Modules of the Project
3.3 Input Design Format
3.4 Output Design
3.5 Table Design
3.6 Supporting Diagrams (ER/DFD/Use Case)

4 Implementation and Testing
4.1 Coding Methods
4.2 Testing Approach
4.3 Implementation and Maintenance

5 Project Evaluation
5.1 Project Outcome
5.2 Limitations of the Project
5.3 Further Scope of the Project

6 Conclusion

7 Appendix
7.1 Source Code
7.2 Screenshots and Reports

8 References

Size of the Project

The Project Report contents should be a maximum of not exceeding 70 pages.

Course Designed by	Mr. K. Vijayakumar	
Verified by HOD	Mr. K. Vijayakumar	
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D. PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT6S1			**Title** SEC IV : Naan Mudhalvan: Generative AI Web Development Lab. I	**Batch:**	2026 - 2029
					Semester:	VI
Practical Hrs./Week	2	**Tutorial Hrs./Sem.**	--		**Credits:**	1

Course Objective

To leverage AI for creative content generation and build professional websites using Wix with minimal coding.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To apply Wix and AI tools to design, develop, and publish functional websites.	PO1(2), PO2(2), PO3(3), PO4(2), PO5(3), PO6(1), PO8(1), PO10(3), PO11(2), PO13(1), PO15(2)
CO2	To evaluate AI-generated content, website performance, and user engagement for improvements.	PO1(2), PO2(3), PO3(2), PO4(3), PO5(2), PO6(2), PO8(1), PO9(1), PO10(3), PO11(2), PO13(1), PO15(2)
CO3	To compare different AI-powered design approaches to optimize website aesthetics and functionality.	PO1(2), PO2(3), PO3(3), PO4(2), PO5(2), PO6(2), PO8(1), PO10(3), PO11(2), PO13(1), PO15(2)
CO4	To develop an interactive, AI-enhanced website with innovative content and advanced features.	PO1(2), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(1), PO9(1), PO10(3), PO11(3), PO13(2), PO14(1), PO15(2)
CO5	To Integrate AI-driven features and automation into a fully functional, user-friendly website to enhance user experience and engagement.	PO1(2), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(2), PO9(2), PO10(3), PO11(3), PO12(1)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	2	2	3	2	3	1	-	1	-	3	2	-	1	-	2
CO2	2	3	2	3	2	2	-	1	1	3	2	-	1	-	2
CO3	2	3	3	2	2	2	-	1	-	3	2	-	1	-	2
CO4	2	3	3	3	3	2	1	1	1	3	3	-	2	1	2
CO5	2	3	3	3	3	2	1	2	2	3	3	1	-	-	-

3 Point Scale – 1, 2, 3

Content	Hrs
Wix • Customization of website by adding interactive elements • Make a website functional by adding a blog section and optimization for mobile view. • Add or update Mailchimp subscribers when a new Wix form is submitted • Create HubSpot contacts when a new Wix Form is submitted • Add rows to Google Sheets spreadsheets when a new Wix Form is submitted	30
Total Contact Hrs.	**30**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group discussion

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT6S2			**Title**	**Batch:**	2026 - 2029
				SEC IV: Naan Mudhalvan: Generative AI Web Development Lab. II	**Semester:**	VI
Practical Hrs./Week	2	**Tutorial Hrs./Sem.**	--		**Credits:**	1

Course Objective

To use AI-driven design and Framer's no-code/low-code tools to create interactive, high-performance websites.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To utilize Framer's no-code/low-code tools and AI features to design and develop responsive websites.	PO1(2), PO2(2), PO3(3), PO4(2), PO5(3), PO6(1), PO8(1), PO10(3), PO11(2), PO13(1), PO15(2)
CO2	To assess website performance, user interactions, and AI-generated elements for optimization.	PO1(2), PO2(3), PO3(2), PO4(3), PO5(2), PO6(2), PO8(1), PO9(1), PO10(3), PO11(2), PO13(1), PO15(2)
CO3	To compare and critique different AI-powered design strategies for improving functionality and aesthetics.	PO1(2), PO2(3), PO3(3), PO4(2), PO5(2), PO6(2), PO8(1), PO10(3), PO11(2), PO13(1), PO15(2)
CO4	To build a fully functional, AI-enhanced interactive website with innovative design and automation.	PO1(2), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(1), PO9(1), PO10(3), PO11(3), PO13(2), PO14(1), PO15(2)
CO5	To design and develop an AI-powered, interactive website using Framer, integrating automation and dynamic user experiences.	PO1(2), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(2), PO9(2), PO10(3), PO11(3), PO12(1), PO13(2), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	2	2	3	2	3	1	-	1	-	3	2	-	1	-	2
CO2	2	3	2	3	2	2	-	1	1	3	2	-	1	-	2
CO3	2	3	3	2	2	2	-	1	-	3	2	-	1	-	2
CO4	2	3	3	3	3	2	1	1	1	3	3	-	2	1	2
CO5	2	3	3	3	3	2	1	2	2	3	3	1	2	1	3

3 Point Scale – 1, 2, 3

Content	Hrs.
Framer • Create Button Hover Animation • Create Smooth Page Transition • Animate a Box using Framer Motion • Build a website for an Arts and Science College • Build a online shopping website • Build a website for online educational content.	30
Total Contact Hrs.	**30**

Pedagogy and Assessment Methods:

Direct Instruction, Digital Presentation, Test, Assignments, Group discussion

Course Designed by	Dr. C.R. Durga devi	C.R. Durga devi	
Verified by HOD	Mr. K. Vijayakumar		K. VIJAYAKUMAR, MCA., M.Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian		Dr. R. MANICKA CHEZIAN M.Sc., M.S., Ph.D., PRINCIPAL i/c, Nallamuthu Gounder Mahalingam College, Pollachi - 642 001, Coimbatore District.

Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	26UIT6AL			**Title**	**Batch:**	2026 - 2029
				ALC - II Digital Forensics (Optional) – Self study	**Semester:**	VI
Lecture Hrs./Week	SS	**Tutorial Hrs./Sem.**	-		**Credits:**	2**

Course Objective

To cultivate knowledge on handling digital evidence, system artifacts and anti-forensic concepts.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	PO Mapping
CO1	To remember the fundamentals of digital forensics.	PO1(3), PO2(2), PO3(2), PO4(1), PO5(2), PO6(2), PO8(2), PO10(2), PO11(1), PO13(1), PO15(1)
CO2	To understand about digital evidence	PO1(3), PO2(3), PO3(2), PO4(2), PO5(2), PO6(2), PO8(2), PO10(2), PO11(1), PO13(1), PO15(1)
CO3	To apply different types of system artifacts and anti-forensic concepts	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(2), PO7(1), PO8(2), PO9(1), PO10(2), PO11(2), PO13(1), PO15(2)
CO4	To evaluate the privacy search	PO1(2), PO2(3), PO3(2), PO4(3), PO5(2), PO6(3), PO7(1), PO8(3), PO9(2), PO10(2), PO11(2), PO12(1), PO13(2), PO14(1), PO15(2)
CO5	To determine mobile device forensics	PO1(3), PO2(3), PO3(3), PO4(3), PO5(3), PO6(3), PO7(2), PO8(3), PO9(2), PO10(2), PO11(3), PO12(1), PO13(2), PO14(1), PO15(3)

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	1	2	2	-	2	-	2	1	-	1	-	1
CO2	3	3	2	2	2	2	-	2	-	2	1	-	1	-	1
CO3	3	3	3	3	3	2	1	2	1	2	2	-	1	-	2
CO4	2	3	2	3	2	3	1	3	2	2	2	1	2	1	2
CO5	3	3	3	3	3	3	2	3	2	2	3	1	2	1	3

3 Point Scale – 1, 2, 3

Units	Content
Unit I	Introduction – Uses of Digital Forensics – Organizations of Note – Locard‟s Exchange Principles – Scientific Method. Key Technical Concepts: Bits, Bytes and Numbering Schemes – File Extensions and File Signatures – Storage and Memory – Computing Environments – Data Types – File Types – Allocated and Unallocated Space.
Unit II	Labs and Tools: Introduction – Forensic Laboratories - Policies and Procedures – Quality Assurance – Digital Forensic Tools – Accreditation. Collecting Evidence: Crime Scenes And Collecting Evidence - Documenting The Scene - Chain Of Custody – Cloning – Live System Versus Dead System – Hashing – Final Report.
Unit III	System Artifacts: Deleted Data - Hibernation File – Registry – Print Spooling Recycle Bin – Metadata - Restore Points And Shadow Copy –Link Files. Anti-Forensics: Introduction – Hiding Data – Password Attacks – Data Destruction.
Unit IV	Legal Aspect: Criminal Law-Searches Without a Warrant – Search with a Warrant – Electronic Discovery – Internet and E-mail: Internet Overview – Web Browsers – E-Mail – Social Networking Sites.
Unit V	Network Fundamentals – Network Security Tools – Network Fundamentals – Incident Responses – Network Evidence and Investigations – Mobile Cellular Networks – Operating Systems – Cell Phone Evidence - Cell Phone forensic tools - Global Positioning Systems. Challenges and Concerns**:** Standards And Controls – Forensics - Solid State Drives.

Pedagogy and Assessment Methods:

Test, Quiz, Assignments

Text Books:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	John Sammons	The Basics of Digital Forensics, The Primer for Getting Started in Digital Forensics	Syngress	2012
2	Tony Sammes, Brian Jenkinson	Forensic Computing	Second edition, Springer	2007

Reference Books:

S.NO.	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	Cory Altheide and Harlan Carvey	Digital Forensics with Open Source Tools	Elsevier	2011
2	Bill Nelson, Amelia Philips, Chris Steuart	Guide to Computer Forensics and Investigations	5th Edition, CENGAGE Learning	2015
3	**Web Reference** https://www.eccouncil.org/cybersecurity/what-is-digital-forensics/ https://www.bluevoyant.com/knowledge-center/understanding-digital-forensics-process-techniques-and-tools https://www.guru99.com/digital-forensics.html https://www.lumatec.de/en/products/light-source-superlite-s04/			

Course Designed by	Dr. B. Kalaiselvi	B. Kalaiselvi.
Verified by HOD	Mr. K. Vijayakumar	K.VIJAYAKUMAR, MCA.,M.Phil., Head,Dept. of Information Technology NGM College (Autonomous), POLLACHI - 642 001.
Approved by Chairman Academic Council	Dr. R. Manickachezian	Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D., PRINCIPAL i/c Nallamuthu Gounder Mahalingam College Pollachi - 642 001, Coimbatore District.