Nallamuthu Gounder Mahalingam College
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 toengage 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 participateeffectively as a member of a development team and undertake leadership roles in appropriate arena.

Program Outcomes:

PO1	**Problem Solving and Communication Skill:**Ability to apply the knowledge of mathematical fundamentals and programming ability to solve complex problems in the field of Information Technology and to communicate the solution efficiently.
PO2	**Disciplinary Knowledge**: Exhibit the knowledge of emerging technologies and tools to create need based customized applications for Industrial Automations.
PO3	**Entrepreneurship skills:**Ability to become Entrepreneurby acquiring skills related to their domain and to address the industry and social needs with Environmentalconsiderations.
PO4	**Research Related Skills:**Ability to cultivate research-based knowledge for innovating new ideasand solutions to contemporary issues by linking knowledge of Computer Science with other domains.
PO5	**Moral and Ethical Awareness/ Reasoning:** Exhibit professional ethics on usage of digital data.
PO6	**Life Long Learning:** Knack to pursue higher studies of specialization courses by clearing entrance exams in top institutions.
PO7	**Critical Thinking:**Aptitude to analyze, design and implement tools and applications to solve real world hitches.
PO8	**Information / Digital Literacy:** Ability to handle different types of networks, hardware and other resources in large scale platform for Industry 4.0.
PO9	**Data Analytic Skills:** Capability of presenting and securing voluminous data with emerging tools and techniques.
PO10	**Contemporary Skills:** Skill enrichment to provide Web based solutions using recent technologies and tools.

Program Specific Outcomes:

PSO1	To identify and utilize latest updation on recent technologies by applying knowledge on Artificial Intelligence, Internet of Things and Mobile computing.
PSO2	To develop the ability to integrate Information technology with business applications and to impart the knowledge on fundamentals of research.

Mapping (POs and PSOs with COs): H - High, M - Medium, L – Low

NGM College - Department of Information Technology
Scheme of Examination For 2023 - 2026
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	23UTL1C1	Tamil Paper - I	5	-	-	3	25	75	100	3
	23UHN1C1	Hindi Paper - I								
	23UFR1C1	French Paper – I		-	-					
II	23UEN101	Communication Skills – I (Level I) /	5	-	-	3	25	75	100	3
	23UEN102	Communication Skills – I (Level II)		-	-					
III	23UIT101	CC - I : Programming in 'C'	4	-	4	3	25	75	100	4
	23UIT102	CC - II : Computer System Architecture	4	-		3	25	75	100	4
	23UIT1A1/ 23UIT1A2	GE I - Allied I : Mathematics - I (Statistics)/Numerical Methods	4	-	5	3	25	75	100	4
	23UIT103	CC Lab - I : Programming in 'C'	-	4	-	3	20	30	50	2
	23UIT104	CC Lab. – II : Web Designing (HTML& DHTML)	-	2	-	3	20	30	50	2
IV		AECC I: Environmental Studies	1	-	-	-	-	-	-	-
	23HEC101	Human Excellence - Personal Values & SKY Yoga Practice - I	1	-	-	2	20	30	50	1
V		Extension Activities – Annexure I	-	-	-	-	-	-	-	-
EC		Online Course (Optional) (MOOC / NPTEL / SWAYAM)								Grade
		Total	24	6	9				650	23

EC – Extra Credit Course / Certificate Course / Co-scholastic Course / Job Oriented Course

CC – Core Course; GE – Generic Elective; AECC - Ability Enhancement Compulsory Course

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	23UTL2C2	Tamil Paper - II	5	-	-	3	25	75	100	3
	23UHN2C2	Hindi Paper - II		-	-					
	23UFR2C2	French Paper – II		-	-					
II	23UEN202 /	Communication Skills – II (Level I) /	5	-	-	3	25	75	100	3
	23UEN203	Communication Skills – II (Level II))		-	-					
III	23UIT205	CC - III : Object Oriented Programming with Java	4	-	-	3	25	75	100	4
	23UIT206	CC - IV : Data Structures	4	-	-	3	25	75	100	4
	23UIT2A1/ 23UIT2A2	GE II - Allied II : Mathematics II (Discrete Mathematics)/Operations Research	4	-	10	3	25	75	100	4
	23UIT207	CC Lab - II : Programming in Java	-	4	-	3	20	30	50	2
	23UIT2S1/ 23UEL2S2	SEC I: Naan Mudhalvan: Web Programming Lab. (PHP)/ Professional Skills	-	2	-	2	20	30	50	2
IV	23EVS201	AECC I: Environmental Studies	1	-	-	2	-	50	50	2
	23HEC201	Human Excellence - Family Values & SKY Yoga Practice – II	1	-	-	2	20	30	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
EC	23CMM201	Manaiyiyal Mahathuvam - I	15 Hrs		-	2	-	50	50	Grade
	23CUB201	Uzhavu Bharatham – I	15 Hrs		-	2	-	50	50	Grade
		Online Course (Optional) (MOOC / NPTEL / SWAYAM)	-	-	-	-	-	-	-	-
Total			24	6	10				700	25

EC – Extra Credit Course / Certificate Course / Co-scholastic Course / Job Oriented Course
CC – Core Course; GE – Generic Elective; AECC - Ability Enhancement Compulsory Course;
SEC – Skill Enhancement Course

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	23UTL3C3	Tamil Paper - III	3	-	-	3	25	75	100	3
	23UHN3C3	Hindi Paper - III		-	-					
	23UFR3C3	French Paper – III		-	-					
II	23UEN3C3	Communication Skills – III	3	-	-	3	25	75	100	3
III	23UIT308	CC - V : Operating Systems	5	-	-	3	25	75	100	4
	23UIT309	CC - VI : Relational Database Management System	4	-	-	3	25	75	100	4
	23UIT3A1/ 23UIT3A2	GE III - Allied III : Microprocessor and Assembly Language Programming/ Embedded Systems	5	-	-	3	25	75	100	4
	23UIT310	CC Lab - III : RDBMS	-	4	-	3	20	30	50	2
	23UIT311	CC Lab. – IV: Excel Lab.	-	4	-	3	20	30	50	2
IV	23UIT3N1/ 23UIT3N2	Non Major Elective - I : Social Networks / Non Major Elective - I : Hardware & Networking	1	-	-	2	-	50	50	2
	23HEC303	Human Excellence - Professional Values & Ethics – III	1	-	-	2	20	30	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
EC	23CMM302	Manaiyiyal Mahathuvam - II	15 Hrs.		-	2	-	50	50	Grade
	23CUB302	Uzhavu Bharatham – II	15 Hrs.		-	2	-	50	50	Grade
	23UIT3VA	VAC I : Cyber Security	30 Hrs.							2*
			22	8					700	25

EC – Extra Credit Course / Certificate Course / Co-scholastic Course / Job Oriented Course
CC – Core Course; GE – Generic Elective; VAC-Department Specific Value Added Course;
*Extra Credits;

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	23UTL4C4	Tamil Paper - IV	3	-	-	3	25	75	100	3
	23UHN4C4	Hindi Paper - IV		-	-					
	23UFR4C4	French Paper – IV		-	-					
II	23UEN4C4	Communication Skills – IV)	3	-	-	3	25	75	100	3
III	23UIT412	CC - VII : Data Communication and Networks	5	-	-	3	25	75	100	4
	23UIT413	CC - VIII : Advanced Java Programming	5	-	5	3	25	75	100	4
	23UIT4A1/ 23UIT4A2	GE IV - Allied IV : Software Engineering/Software Project Management	5	-	-	3	25	75	100	4
	23UIT414	CC Lab.- V : Programming in Advanced Java	-	5	-	3	20	30	50	2
	23UIT4S1/ 23UIT4S2	SEC II: Naan Mudhalvan: Advanced Excel Lab. / Quantitative Aptitude	-	2	-	2	20	30	50	2
IV	23UIT4N1 / 23UIT4N2	Non Major Elective - II : Data Analytics / Non Major Elective - II : Computer Security	1	-	-	2	-	50	50	2
	23HEC404	Human Excellence - Social Values & SKY Yoga Practice – IV	1	-	-	2	20	30	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	50	1
EC	23CMM403	Manaiyiyal Mahathuvam - III	15 Hrs.		-	2	-	50	50	Grade
	23CUB403	Uzhavu Bharatham - III	15 Hrs.		-	2	-	50	50	Grade
	23UIT4VA	VAC II: Social Networks	30 Hrs.							2*
	Total		23	7					750	26

EC – Extra Credit Course / Certificate Course / Co-scholastic Course / Job Oriented Course
CC – Core Course; GE – Generic Elective; SEC – Skill Enhancement Course; VAC-Department Specific Value Added Course;
*Extra Credits;

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	23UIT515	CC -IX : Information Security	5	-	-	3	25	75	100	4
	23UIT516	CC - X : Visual Programming	5	-	5	3	25	75	100	4
	23UIT5E1/ 23UIT5E2/ 23UIT5E3	**DSE -I:**#	5	-	-	3	25	75	100	4
	23UIT517	CC Lab - VI : Visual Programming	-	5	-	3	20	30	50	2
	23UIT518	CC Lab - VII : Software Testing & Data Visualization Tools	-	5	-	3	20	30	50	2
	23UIT5S1/ 23UIT5S2	SEC III: Graphic Designing Lab. (Photoshop / Canva)	-	4	-	-	20	30	50	2
IV	23HEC505	Human Excellence - National Values & SKY Yoga Practice - V	1	-	-	2	20	30	50	1
EC	23CSD501	Soft Skills Development - I	-		-	-	-	-	-	Grade
	23GKL501	General Knowledge	SS			2	-	50	50	Grade
	23UIT5AL	ALC – I Cyber Law (Optional) – self study	SS		-				100	2**
		Total	16	14	5				500	19

Discipline Specific Elective (DSE) – I #

23UIT5E1: Data Mining
23UIT5E2:Cloud Computing
23UIT5E3: Wireless Networks

EC – Extra Credit Course / Certificate Course / Co-scholastic Course / Job Oriented Course

CC – Core Course; DSE – Discipline-Specific Elective; SEC – Skill Enhancement Course

ALC-Advanced Learner Course (Optional)

*Extra Credits; **Credits – Based on course content maximum of 4 credits

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	23UIT619	CC - XI : Python Programming	6	-	-	3	25	75	100	4
	23UIT6E4/ 23UIT6E5/ 23UIT6E6	**DSE -II:**##	5	-	-	3	25	75	100	4
	23UIT6E7/ 23UIT6E8/ 23UIT6E9	**DSE -III:**###	6	-	-	3	25	75	100	4
	23UIT620	Core Lab - VIII : Python Programming	-	5	-	3	20	30	50	2
	23UIT621	Core Lab IX: Linux	-	5	-	-	20	30	50	2
	23UIT6S1/ 23UIT6S2	SEC IV :Naan Mudhalvan: Multimedia Lab.(Flash / 3Ds Max)	-	2	-	2	20	30	50	2
	23UIT622	Project	-	-	-	-	25	75	100	3
IV	23HEC606	Human Excellence - Global Values & SKY Yoga Practice - VI	1	-	-	2	20	30	50	1
EC	23CSD602	Soft Skills Development - II	-	-	-	-	-	-	-	Grade
	23UIT6AL	ALC - II Digital Forensics(Optional) – Self study	SS	-	-	-	-	-	100	2**
Total			18	12					600	22
Grand Total									3900	140+8*

Discipline Specific Elective (DSE) – II ##	**Discipline Specific Elective (DSE) – III** ###
23UIT6E4:Big data Analytics 23UIT6E5:Artificial Intelligence 23UIT6E6:E-Commerce	23UIT6E7: Social Media Analytics 23UIT6E8: : Internet of Things 23UIT6E9: 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

AL-Advanced Learner Course (Optional); 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

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		

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

Size of the Project

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

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:	23UIT101			Title	Batch:	2023 - 2026
				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	Knowledge Level
CO1	To keep in mind the fundamentals of C programming.	K1
CO2	To understand the concepts of problem solving techniques.	K2
CO3	To apply concepts and techniques for implementation.	K3
CO4	To analyze the level of logical thinking in program development	K4
CO5	To evaluate the program output.	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	L	-	-	-	H	-	-	-	-	-	-
CO2	H	-	L	M	-	M	H	L	M	L	-	L
CO3	M	L	M	H	M	M	H	-	M	L	-	M
CO4	H	-	M	-	L	-	H	M	M	M	-	L
CO5	M	M	-	M	-	L	M	-	-	L	-	-

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

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD/ Roll Play /APS)

Text Book

- Ashok .N. Kamthane. (2009). *PROGRAMMING AND DATA STRUCTURES*. First Indian Print. Pearson Education: ISBN 978-81-317-2423-4.

Reference Books

- Balagurusamy. E. (2008). *Programming in ANSI C*. Tata McGraw-Hill.
- PradipDey, ManasGhosh. (2008). *Computer Fundamentals and Programming in C*. Oxford.

Web Reference

- https://www.tutorialspoint.com/cprogramming/index.htm

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: K.Vijayakumar Signature:	Name: K.Vijayakumar Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head, Dept. of Information Technology,
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Dr. R.MANICKA CHEZIAN, M.Sc.,M.S.,Ph.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT102			Title	Batch:	2023 - 2026
				CC- II : Computer System Architecture	Semester:	I
Lecture Hrs./Week	4	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	Knowledge Level
CO1	To remember basic building block of digital computer system	K1
CO2	To understand the execution sequence of instruction through the processor	K2
CO3	To apply interfacing of various peripheral devices used with the system	K3
CO4	To analyze functioning of various parts of the computer from hardware point of view	K4
CO5	To judge the pros and cons of various types of memory organizations	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	L	H	-	M	M	H	H	L	-	M	-
CO2	M	M	L	-	L	L	H	L	L	-	L	-
CO3	L	L	H	-	M	M	H	H	L	-	M	-
CO4	L	L	H	-	H	M	H	H	M	-	M	-
CO5	L	M	L	M	L	L	M	H	H	-	L	-

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.	**13**
Unit II	**Basic Computer Organization and Design:** Instruction Codes - Computer Registers – Computer Instructions – Instruction Cycle – Memory Reference Instructions – InputOutput and Interrupt.	**12**
Unit III	**Central Processing Unit (CPU):** General Register Organization – Stack Organization - Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control.	**12**
Unit IV	**Input – Output Organization:** Peripheral Devices- Input – Output Interface – Asynchronous Data Transfer - Direct Memory Access (DMA) - CPU-IOP Communication.	**11**
Unit V	**Memory Organization:** Memory Hierarchy – Main Memory - Auxiliary Memory - Cache Memory – Associative Memory - Virtual Memory.	**12**
	Total Contact Hrs.	**60**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(Roll Play)

Text Book

- M. Morris Mano. (2023), Computer System Architecture, Revised 3rd Edition .Pearson.

Reference Books

- M. Carter. (2001). Computer Architecture. Schaum‘s outline series, TMH Pub.
- William Stallings. (2006), Computer System and Architecture, 8th Edition, Pearson Publication.

Web Reference

- https://www.youtube.com/watch?v=aWp8ILQgudI
- https://www.youtube.com/watch?v=OwC4JN64QYY

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: C.R. Durga devi Signature:	Name: K.Vijayakumar Signature:	Name: Mr. K. Srinivasan Signature:	Name:Dr. R. Manickachezian Signature:

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Programme Code:	B.Sc. - IT			**Programme Title :**	Information Technology	
Course Code:	23UIT1A1			**Title:**	**Batch :**	2023 - 2026
				GE I – Allied I: Mathematics – I (Statistics)	**Semester :**	I
Lecture Hrs/Week:	4	**Tutorial Hrs./ Sem.**	5		**Credits :**	4

Course Objective

Learning various statistical methods like central tendency, dispersion, correlation and regression, probability and sampling theory.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To remember the formula of different Means, Median, Mode, Deviations, Correlation, Regression, Probability, Chi square test, Degree of Freedom, etc.	K1
CO2	To understand the concepts Central tendency, Dispersion, Correlation and regression, Probability and Sampling theory.	K2
CO3	To solve the problems by using formula to apply the programs	K3
CO4	To analyze the solution is right or wrong	K4
CO5	To evaluate the results through the program outputs	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	M	H	H	M	L	-	-	L	-	-
CO2	M	M	H	H	H	H	-	-	-	L	-	M
CO3	H	-	L	H	H	M	M	-	-	-	-	M
CO4	M	M	M	H	H	L	-	-	-	-	-	H
CO5	L	L	M	H	H	M	-	-	-	-	-	M

Units	Content	Hrs. L+T
Unit I	**Measures of central tendency:** Mean: Arithmetic Mean, Weighted Arithmetic Mean, Combined Arithmetic Mean, Geometric Mean, Harmonic Mean, Median and mode – Relation betweenmean, median and mode.	11+1
Unit II	**Dispersion:** Range - Mean deviation - Standard deviation - Coefficient of Variation – Quartile Deviation.	9+1
Unit III	**Correlation:** Karl Pearson`s Coefficient of Correlation – Rank correlation**.** **Regression:** Regression Equations - Difference betweencorrelation& Regression.	9+1
Unit IV	**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.	13+1
Unit V	**Sampling Theory and Test of Significance**: Introduction – Estimation theory – Testing of hypothesis – Testing if significance for large samples and small samples. **Chi Square Test:** Introduction – x^2 test, Degrees of freedom, Test of goodness of fit, Test of Independence.	13+1
	Total Contact Hrs.	**60**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD/ Roll Play /APS)

Text Book

- Pillai R. S. N. Bagavathi V. (2019). *Statistical Methods***.** 8th Edition, Sultan Chandand Sons & Company Ltd. New Delhi.

Reference Books

- Gupta. S.C. Kapoor. V.K. (Reprint 2014). *Fundamentals of Mathematical Statistics*.11th edition. S. Chand and Sons.

Web Reference

- https://www.tutorialspoint.com/statistics/index.htm
- https://www.google.com/amp/s/www.edureka.co/blog/statistics-and-probability/amp/

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			**Programme Title :**	Information Technology	
Course Code:	23UIT1A2			**Title:**	**Batch :**	2023 - 2026
				GE I – Allied 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	Knowledge Level
CO1	To remember numerical analysis techniques	K1
CO2	To understand the solution to problems of algebraic and transcendental equations, simultaneous linear equations.	K2
CO3	To solve the problems using Newton forward and backward interpolation	K3
CO4	To analyze the differential equations	K4
CO5	To evaluate the ordinary differential equations	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	L	H	H	M	L	-	M	L	-	-
CO2	M	M	H	H	H	H	-	-	M	L	-	M
CO3	H	-	L	H	H	M	M	-	-	-	-	M
CO4	M	M	M	H	H	L	-	-	M	-	-	H
CO5	L	L	M	H	H	M	-	-	-	-	-	M

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.	15
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.	13+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 - RungeKutta method - Second order RungeKutta Method	13+1
	Total Contact Hrs.	**60**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD/ Roll Play /APS)

Text Book:

- Kandasamy P, Thilagavathy K and Gunavathi K, Numerical Methods, S. Chand company Ltd, 2012..

Reference Books

- Venkataraman M. K, Numerical Methods in Science and Engineering, The National Publishing Company, Madras, 2009.

Web Reference

- https://nptel.ac.in/courses/111107105

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B. Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT103			**Title**	**Batch:**	2023 - 2026
				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 improving the programming skills in 'C'**.**

Course Outcomes

CO Number	CO Statement	Knowledge Level
CO1	To apply appropriate mathematical and scientific program logic	K3
CO2	To apply appropriate pointers, structure, and files	K3
CO3	To apply appropriate data structure concepts	K3
CO4	To analyze a problem in different logic	K4
CO5	To verify the solutions of various problems with input and output data	K5
CO6	To create a program using preprocessor directives.	K6

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	L	-	M	M	L	-	L	-	-	-
CO2	H	M	-	-	M	H	L	-	-	M	-	-
CO3	H	M	M	-	H	H	M	-	L	-	-	-
CO4	H	M	M	-	M	M	H	-	M	-	-	-

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. **Test II** 11. Develop a C program to implement array of pointers. 12. Create a C program to implement functions using call by value. 13. Execute a C program to implement functions using call by reference. 14. Create a C program to implement structure and array of structure. 15. Develop a C program to implement union. 16. Execute a file to perform read and write operations using file accessing modes. 17. Create a C program to implement preprocessor directives.	60
Total Contact Hrs.	60

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Discussion

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT104			**Title**	**Batch:**	2023 - 2026
				CC Lab. -II : Web Designing (HTML & DHTML)	**Semester:**	I
Practical Hrs./Week	2	**Tutorial Hrs./Sem.**	-		**Credits:**	2

Course Objective

To know the Basic and Advanced Tags of HTML, Style sheets, and to know the basics of Angular and JavaScript.

Course Outcomes

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

CO	CO Statement	Knowledge
CO1	To develop webpage using various style sheet formats and HTML tags	K3
CO2	To analyze various style sheet formats for web pages	K4
CO3	To assess the various functions in Angular and JavaScript for creating applications	K5
CO4	To verify the usage of CSS creating applications	K5
CO5	To create applications using Advanced Tags of HTML	K6

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	M	M	L	L	M	M	L	L	H	L	M
CO2	L	M	L	L	L	L	H	L	H	H	L	M
CO3	L	M	M	L	L	M	M	M	H	H	L	M
CO4	L	M	L	L	L	L	H	L	H	H	L	M
CO5	L	M	M	L	L	M	M	L	L	H	L	M

Content	Hrs.
SAMPLE PROGRAM LIST **Test I(HTML)** 1. Experiment with Webpage creation using CSS. 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 Style sheets in web pages **Test II (DHTML)** 1.Write a DHTML program for changing Background colour 2. Write a DHTML program for events of KEYUP AND KEYDOWN 3. Write a DHTML program for events ONSUBMIT AND ONFOCUS 4. Write a DHTML program for generating blinking header 5. Write a DHTML program for moving and shaking an Image	**30**

Pedagogy:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Task(GD)

WEB REFERENCES:

- https://www.w3schools.com/
- https://www.tutorialspoint.com/html/index.htm

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc.- IT			**Programme Title:**	Information Technology	
Course Code:	23UIT205			**Title**	**Batch:**	2023 - 2026
				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	Knowledge Level
CO1	To keep in mind the basic concepts of OOPs	K1
CO2	To apprehend a knowledge about how to use java for internet applications	K2
CO3	To implement file, applet, thread concepts for web applications	K3
CO4	To review the usage of packages, exceptions and string concept for developing stand - alone java programs	K4
CO5	To assess the various types of stream classes and file handling	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M	-	M	H	H	L	L	L	M	M
CO2	H	H	H	-	L	L	H	L	M	H	M	M
CO3	M	H	H	-	L	M	H	L	M	H	M	M
CO4	H	H	H	M	M	M	M	L	M	M	-	-
CO5	H	H	M	M	L	M	M	M	M	L	-	-

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. **Interfaces: Multiple Inheritance.**	13
Unit III	**Packages: Putting classes together**: Introduction – API packages – System packages – Naming Conventions – Creation – Accessing – Using – Adding a Class to a package – Hiding classes – Static import. **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.**	12
Unit IV	**Abstract Windowing Toolkit (AWT) - Applet Programming:** Introduction – Difference between Applet and other Applications - Writing and Building Applet - Life Cycle – Creating Executable applets – Designing a Web page – Applet Tag – Applet to HTML – Running Applets – Passing Parameters – Aligning the display – HTML tags – Numerical Values – User input – Event Handling.	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

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD)

Text Book

- E. Balagurusamy. (2019). "Programming with JAVA – A Primer", Tata McGraw-Hill Publishing Company Limited, 6th Edition. (Unit I, II, III, V)
- Instructional Software Research and Development (ISRD) Group. 2001. "Introduction to Object Oriented Programming through Java", Tata McGraw-Hill Publishing Company Limited, New Delhi. (Unit IV – AWT)

Reference Books

- Herbert Schild, (2002). Java Complete Reference, 5th Edition, Tata McGraw Hill Pub
- Y. Daniel Liang (2018) Intro to Java Programming (Comprehensive Version), 10th Edition Pearson Publication.

Web Reference

- https://youtu.be/uWYPVz_i7W4
- https://youtu.be/7s3xDfdqfDw

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
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Programme Code:	B. Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT206			**Title**	**Batch:**	2023 - 2026
				CC- IV: Data Structures	**Semester:**	II
Lecture Hrs/Week:	4	**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	Knowledge Level
CO1	To recollect basic concepts of data handle.	K1
CO2	To comprehend data structures like stack, queue, linked list and trees..	K2
CO3	To implement data structure techniques in problem solving	K3
CO4	To analyze space and time complexity of algorithms and to evaluate various data structures.	K4
CO5	To evaluate different algorithm results through the program outputs	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	-	-	-	L	M	-	-	-	-	-	-
CO2	M	-	-	-	M	H	M	-	M	-	-	-
CO3	H	M	-	M	-	-	M	-	-	-	-	-
CO4	H	-	-	H	-	H	M	-	H	-	-	L
CO5	H	-	M		M	M	-	-	-	-	-	L

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.	**13**
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.	10
Unit III	**Queues:** Introduction - Queue as anAbstract Data Type - Representation of Queues - Circular Queues - Double Ended Queues - Dequeue - Priority Queues - Application of Queues.	11
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.	**13**
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.	**13**
	Total Contact Hrs.	60

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD/ Roll Play /APS)

Text Book

- ISRD group. (2010). Data structure using C. Seventh Reprint. Tata McGraw-Hill.

Reference Books

- Aaron .M. Tanenbaum, YedidyehLangsam, Moshe .J. Augenstein. (2007). *Data Structure using C*. 3rdEdition.PHI Pub.
- Ashok. N. Kamthane. (2004). *Programming And Data Structures*. First Indian Print. Pearson Education. ISBN 81-297-0327-0.

Web Reference

- https://www.tutorialspoint.com/data_structures_algorithms/index.htm
- https://www.javatpoint.com/data-structure-tutorial

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT2A1			**Title**	**Batch:**	2023 – 2026
				GE II – Allied II : 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	Knowledge Level
CO1	To remember the basic concepts of set theory, mathematical logic, relations and graph theory.	K1
CO2	To infer the basic terminology of discrete mathematics	K2
CO3	To construct discrete notations in the programs	K3
CO4	To analyze discrete concepts through programs	K4
CO5	To determine languages and grammars for programming	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	L	L	L	H	M	M	-	M	-	M
CO2	-	M	M	M	-	M	M	L	L	L	-	M
CO3	M	M	M	M	-	M	-	L	-	-	-	M
CO4	M	L	L	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

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 – Representation of graphs in computer memory - Trees - Properties of trees – Binary trees – Computer Representation of general trees.	**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

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Assignments

Text Book

- Sharma. J.K. (2005). *Discrete Mathematics*. 2nd Edition. Macmillan India Ltd.

Reference Books

- Kenneth H. Rosen. (2003). *Discrete Mathematics and Its Applications*, 5th Edition, McGraw Hill Pub.

- Dr. Venkataraman. M. K. Dr. Sridharan. N, Chandarasekaran. N. (2000). *Discrete Mathematics*. The National publishing Company Chennai.

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	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT2A2			**Title**	**Batch:**	2023 – 2026
				GE II – Allied 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	Knowledge Level
CO1	To remember the concepts of linear programming methods	K1
CO2	To understand the concepts of transportation, networking, replacement, etc.,	K2
CO3	To solve the problems optimization techniques to solve the computer based business problems	K3
CO4	To analyze the ability of critical thinking, to find shortest time duration	K4
CO5	To evaluate the Economic order quantity	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	L	L	L	H	M	M	-	M	-	M
CO2	-	M	M	M	-	M	M	L	L	L	-	M
CO3	M	M	M	M	-	M	-	L	-	-	-	M
CO4	M	L	L	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

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

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Assignments

Text Book

- KantiSwarup, PK Gupta, Man Mohan. (2020). *Operations Research***.** Sultan Chand and Sons & Company Ltd. New Delhi.

Reference Books

- S. DharaniVenkatakrishnan. (2015), *Operations Research*. Keerthi Publishing P.Ltd.
- G. Srinivasan. (2017), *Operations Research: principles and Applications*2 nd Edition.

Web Reference

- https://rb.gy/6m3df
- https://rb.gy/mq3k4

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT207			**Title**	**Batch:**	2023 - 2026
				CC Lab.-II: Programming in Java	**Semester:**	II
Practical Hrs./Week	4	**Tutorial Hrs./Sem.**	-		**Credits:**	2

Course Objective

To apply various concepts of java like inheritance, multithreading, exception handling, AWT, applet, 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	Knowledge Level
CO1	To apply basic object oriented programming concepts in Java	K3
CO2	To analyze the usage of packages, exceptions in program development	K4
CO3	To prove the need of Applets in internet applications development	K5
CO4	To verify the database connectivity using Java	K5
CO5	To create forms using AWT components	K6

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO 9	PO10	PSO 1	PSO2
CO1	H	H	M	L	M	H	H	L	L	L	M	M
CO2	H	H	H	M	M	M	M	L	M	M	L	L
CO3	H	H	H	L	L	L	H	L	M	H	M	M
CO4	H	H	H	M	M	M	M	L	M	M	L	L
CO5	H	H	H	L	L	L	H	L	M	H	M	M

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. **Test II** 7. Develop a Program using threads. 8. Test for inter-thread communication in program 9. Test for Exception Handling in program 10. Develop a Program for designing shapes using applets. 11. Develop a Program to handle events. 12. Compose a form using AWT Components. 13. Develop a Program to generate files.	**60**

Pedagogy:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group task (Group Discussion)

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT2S1			**Title**	**Batch:**	2023 - 2026
				SEC - I :Naan Mudhalvan : Web Programming Lab.(PHP)	**Semester:**	II
Practical Hrs./Week	2	**Tutorial Hrs./Sem.**	--		**Credits:**	2

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	Knowledge Level
CO1	To motivate the students to create dynamic website	K4
CO2	To test the various tags in the application.	K5
CO3	To create files in the websiteusingdatabase.	K6
CO4	To construct and upload a file to the server and create directory	K6
CO5	To choose and add the products that are selected from a web page	K6

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	H	H	H	M	M		M		H		
CO2	M	H	H	H	M	H	M	M	M	H		H
CO3			M	H		H	M	M	H	H		H
CO4	M	H	M	H	M	H		M	H	H		
CO5	M	H	H	H		H	M		H	H		

Content	Hrs.
SAMPLE PROGRAM LIST 1. Execute a PHP Program to print an array. 2. Execute a PHP Program to sort elements in an array in ascending and descending order. 3. Develop a PHP program to split a string as array elements based on delimiter. 4. Execute a PHP Program to combine the array elements into a string with given delimiter. 5. Develop a PHP Program to Program to create a Simple Calculator. 6. Develop a PHP Programs to create simple Login and Logout using sessions. 7. Develop a PHP Program to upload a file to the Server. 8. Create a PHP Program to create a New Database. 9. Create a PHP Program to connect to the server and selecting database. 10. Create a PHP Program to insert records to the table in Database. 11. Create a PHP Program to fetch records from the table in Database. 12. Create a PHP Program to Store an image in Database. 13. Create a PHP Program to Read image from Database. 14. Create a PHP Program to create a simple Registration form. 15. Create a PHP program for Contact form.	30
Total Contact Hrs.	30

Pedagogy:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Discussion

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			Programme Title :	Information Technology	
Course Code:	23UIT308			Title:	Batch :	2023 - 2026
				CC -V: Operating Systems	Semester :	III
Lecture Hrs/Week:	5	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 NT, XP, & 7.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To recollect fundamentals of operating system concepts.	K1
CO2	To understand basic principles and advanced concepts of the operating system.	K2
CO3	To apply the different mathematical foundations, algorithmic principles with approaches in computer based systems.	K3
CO4	To analyze the various architectural components involved in OS and its applications.	K4
CO5	To evaluate different operating system configurations	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	-	L	-	L	-	H	-	-	-	-	L	-
CO2	L	H	H	M	-	H	M	-	L	L	-	-
CO3	H	M	L	M	M	M	M	M	M	M	M	H
CO4	M	H	M	H	M	H	M	M	H	M	-	M
CO5	-	H	-	M	H	H	-	M	H	H	M	M

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.	15
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.	15
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.	15
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.	15
Unit V	**Windows NT/2000:** History – Programming: Native NT API – Win32 API – Registry. Structure – Booting – Processes and Threads – Memory Management – NTFS – Security. **Windows XP & 7**: Introduction – Design principles - Architecture.	15
	Total Contact Hrs.	**75**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD/ Roll Play /APS)

Text Book

- Achyut s Godbole. (2005). *Operating Systems*, 2nd Edition, TMH Publications (Units I – IV).

Reference Books

- H. M Deitel. (2003). *Operating Systems*, 2nd Edition, Pearson Education Publication.
- Abraham Silberschatz, Peter B. Galvin, Greg Gagne (2018), *Operating System Concepts*, 10th edition, Abridged Print Companion.

Web References:

- https://www.tutorialspoint.com/operating_system/index.htm **(Unit V)**
- https://www.os-book.com/OSE1/slide-dir/PDF-dir/ch16.pdf
- http://cc.ee.ntu.edu.tw/~farn/courses/OS/slides/ch23.pdf

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT309			Title	Batch:	2023 - 2026
				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	Knowledge Level
CO1	To keep in mind the basic concepts of database	K1
CO2	To get the idea of a database from SQL statements	K2
CO3	To execute different forms of queries using SQL and PL/SQL statements	K3
CO4	To analyze various data models which describe the structure of database	K4
CO5	To interpret PL/SQL commands in programming	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	-	L	L	L	H	-	H	L	L	H
CO2	H	L	M	L	-	L	L	H	M	M	-	H
CO3	H	L	M	H	-	L	L	M	H	M	-	H
CO4	L	M	L	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

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

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD)

Text Book

- Nilesh Shah. (2009), *Database Systems Using Oracle*, 2nd edition,PHI.

Reference Books

- Ivan Bayross (2017), *SQL, PL/SQL the Programming Language of ORACLE*, 4th Edition, BPB Publications.
- ArunMajumdar&Pritimoy Bhattacharya. (2001). Database *Management Systems*, TMH.
- Jeffrey A. Hoffer, Joey F. George, Joseph S. Valacich, (2009). *Modern Systems Analysis and Design*. 2nd Edition. 5th Edition. Pearson Education Pub's.
- Gerald V. Post. (2005). *Database Management Systems*, 3rd Edition, TMH.

Web References

- https://intellipaat.com/blog/tutorial/sql-tutorial/rdbms/
- https://www.youtube.com/watch?v=J5wjIf4gdq4
- https://www.youtube.com/watch?v=DEwgEFHHn0M

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT3A1			**Title**	**Batch:**	2023 – 2026
				GE III – Allied III : Microprocessor and Assembly Language Programming	**Semester:**	III
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

Understand the evolution of microprocessor, Addressing modes, pin diagrams of various processors, Assembly Language Programs,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	Knowledge Level
CO1	To Recall in mind the various microprocessor and microcontrollers manufacturer name, year, versions, bit-size, etc	K1
CO2	To Understand the basic concepts of 16 bit and 32 bit microprocessors.	K2
CO3	To apply the instructions in the Assembly Language Programs.	K3
CO4	To analyze the various products of processors and controllers.	K4
CO5	To Conclude the various products of processors and controllers.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	H	H	H	H	M	H	H	H	M	M
CO2	H	M	H	H	M	M	H	M	H	M	M	H
CO3	M	H	H	H	M	H	H	M	M	H	H	M
CO4	M	M	M	M	M	M	M	H	H	M	M	M
CO5	M	M	L	H	M	M	M	M	M	L	M	M

Units	Content	Hrs.
Unit I	**Introductionto** M**icroprocessors**: 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.	16
Unit II	8**086 Instruction Set** – Instruction Groups – Addressing Mode Byte – Segment Register Selection – Segment Override – 8086 Instructions. **Assembly LanguageProgramsfor8086**: Largest Number, Smallest Number in a Data Array – Numbers in Ascending and Descending order – Block Move or Relocation – Block Move using REP instruction – Sum of a series – Multi byte Addition.	15
Unit III	**Intel 386 and 486 Microprocessors**: Intel 386 and 486 Microprocessor – 486DX Architecture – Register Organization of 486 Microprocessor – Memory Organization – Operating Modes of Intel 486 – Virtual Memory – Memory Management Unit – Gates – Interrupts and Exceptions – Addressing Modes of 80486 – Pin Configuration - Input devices – Output devices.	15
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. **Mobile Processors:** Introduction – Models – Architecture	15
Unit V	**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	14
	Total Contact Hrs.	**75**

Pedagogy:

Digital Presentation, Chalk and talk, Flipped class

Assessment Methods:

Seminar, Quiz, Assignment, Group task.

Text Book

- Badri Ram, (2007), *Advanced Microprocessors and Interfacing*. Tata McGraw-Hill Publishing. Company Limited, Fourteenth reprint.

Reference Books

- A.K. Ray, K.M. Bhurchandi, (2007),*Advanced Microprocessors and Peripherals*. Tata McGraw-Hill Publishing Company Limited, 2nd Edition.p
- Ramesh S. Gaonkar, (1997), *Microprocessor Architecture, Programming, and Applications with the 8085*. 3rd Edition. PRI India.

Web References:

- 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.

(Unit IV)

- 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	Verified by HOD	Checked by	Approved by
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Name: R. Sekar Signature:	Name: K. Vijayakumar Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT3A2			**Title**	**Batch:**	2023 – 2026
				GE III – Allied III : Embedded Systems	**Semester:**	III
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

Understand the concepts of embedded systems, device drivers, interrupt servicing mechanism and embedded programming in C and C++.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To Recall in mind the various units of the processors	K1
CO2	To Understand the basic concepts of device drivers and interrupt servicing mechanism.	K2
CO3	To apply the instructions in C and C++ Programs.	K3
CO4	To analyze the various real time operating systems.	K4
CO5	To conclude the performance of various operating systems.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	H	-	H	H	M	H	-	H	M	M
CO2	H	M	H	H	M	M	H	-	-	M	M	H
CO3	M	H	H	-	M	H	-	M	-	H	H	M
CO4	-	M	M	L	M	M	M	H	-	M	-	M
CO5	M	M	L	-	M	M	M	M	-	L	M	M

Units	Content	Hrs.
Unit I	**Introduction to Embedded System**: An Embedded System – Processor in the System – Other Hardware units – Software embedded into a system – Exemplary embedded system – Embedded system on chip and in VLSI circuit.	16
Unit II	**Processor and Memory organization**: Structural units in a processor – Processor selection – Memory devices – Memory selection - Allocation of memory – DMA – Interfacing processor, memories and I/O devices. **Devices and buses for device networks**: I/O devices – Timer and counting devices – Serial communication – Host system.	15
Unit III	**Device drivers and Interrupts servicing mechanism**: Device drivers – Parallel port device drivers – Serial port device drivers – Device drivers for IPTD – Interrupt servicing mechanism – Context and the periods for context-switching, dead-line and interrupt latency.	15
Unit IV	**Programming concepts and embedded programming in C and C++**: Software programming in ALP and C – C program elements – Header and source files and processor directives – Macros and functions – Data types – Data structures – Modifiers – Statements – Loops and pointers – Embedded programming in C++ - Java – C program compiler and cross compiler – Source code for engineering tools for embedded C / C++ - Optimization of memory needs	15
Unit V	**Inter - process communication and synchronization of processes, Tasks and threads**: Multiple processor – Problem of sharing data by multiple tasks and routines – Inter process communication. **Real time operating systems**: Operating system services – I/O subsystem – Network operating systems – Real time and embedded operating systems – Interrupt routine in RTOS environment – RTOS task scheduling – Performance metric in scheduling.	14
	Total Contact Hrs.	**75**

Pedagogy:

Digital Presentation, Chalk and talk, Flipped class

Assessment Methods:

Seminar, Quiz, Assignment, Group task.

Text Book

- Raj Kamal, (2007) "Embedded Systems – Architecture, Programming and Design", TMH.

Reference Books

- Daniel w. Lewis, (2007) "Fundamentals of Embedded Software", PHI Education Publications, ISBN, 81-7808-604-2.

Web References:

- https://www.tutorialspoint.com/embedded_systems/es_overview.htm
- https://www.youtube.com/watch?v=uFhDGagZzjs
- https://www.youtube.com/watch?v=JO4AEkOVF2M

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: B. Kalaiselvi Signature:	Name: K. Vijayakumar Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT310			Title	Batch:	2023 - 2026
				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 ORACLE (Basic commands, Trigger, Functions, etc.)

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To apply appropriate queries in oracle	K3
CO2	To apply various commands in SQL and PL/SQL and tags and concepts in the application.	K3
CO3	To analyze various database applications.	K4
CO4	To verify different forms of queries using SQL and PL/SQL statements	K5
CO5	To create various data models which describe the structure of database	K6

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	M	M	-	H	-	M	-	-	-	L
CO2	M	M	H	L	L	M	L	H	-	-	-	L
CO3	-	M	L	H	L	M	-	-	-	M	-	-
CO4	M	M	H	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

Content	Hrs.
SAMPLE PROGRAM LIST **Test I** 1. Experiment with DDL commands. 2. Make use of Constraints 3. Experiment with DML commands. 4. Make use of Arithmetic operations on tables. 5. Determine where clause usage 6. Experiment with Case structures 7. Make use of Built-in functions 8. Determine Group functions usage 9. Make use of Joins and set operations 10. Test for Sub queries usage **Test II PL/SQL Block structure** 1. Test for Control Structures in PL/SQL. 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. Make use of Procedures and Functions 7. Experiment with Packages and Triggers. 8. Experiment Java as Front end and connect the oracle tables.	**60**

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Task.(GD)

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
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Programme Code:	B.Sc. – IT			**Programme Title:**	Information Technology	
Course Code:	23UIT311			**Title**	**Batch:**	2023 - 2026
				CCLab. – IV: Excel Lab.	**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	CO Statement	Knowledge
CO1	To apply different features of excel	K3
CO2	To apply concept of different formulas used in excel	K4
CO3	To verify Formatting techniques and presentation styles.	K5
CO4	To verify Manipulation of data using data names and ranges, filters and sort, and validation lists	K5
CO5	To create clip art to enhance ideas and information in Excel worksheets.	K6

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO 9	PO10	PSO 1	PSO2
CO1	L	M	M	L	L	M	M	L	L	H	L	M
CO2	L	M	L	L	L	L	H	L	H	H	L	M
CO3	L	M	M	L	L	M	M	M	H	H	L	M
CO4	L	M	L	L	L	L	H	L	H	H	L	M
CO5	L	M	M	L	L	M	M	L	L	H	L	M

Content	Hrs.
SAMPLE PROGRAM LIST **Test I** Merge or Split Cells Create a Formula with Function Create a Chart Automatically Fill Data Apply Cell Borders **Test II** Create filters and sort, and validation lists of student data Create clip art to enhance ideas Create different Excel templates Organizing and displaying large amounts and complex data in graph	**60**

Pedagogy:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Task(GD)

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT3N1			**Title**	**Batch:**	2023 - 2026
				Non-Major Elective – I : Social Networks	**Semester:**	III
Lecture Hrs./Week	1	**Tutorial Hrs./Sem.**	-		**Credits:**	2

Course Objective

To provide the overall view of various concepts of Social Networks such as history, classification of social media, services, pros and cons.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To keep in mind basics of Social Networks	K1
CO2	To understand the classification of Social Media	K2
CO3	To deploy various data privacy feature in social media platforms	K3
CO4	To analyze the security aspects in social media.	K4
CO5	To judge the pros and cons of various types of social media platforms	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	-	M	H	M	H	-	L	H	H	M	-	M
CO2	-	M	H	M	H	-	L	M	H	M	-	M
CO3	-	H	H	H	H	-	M	M	H	H	-	M
CO4	-	H	H	H	H	-	M	M	H	H	-	M
CO5	-	L	H	M	H	M	M	M	H	H	-	M

Units	Content	Hrs.
Unit I	Social Networks: Introduction – Definition - History	3
Unit II	Impact of social media - Privacy and Identity : Data Sh7aring and Safety	3
Unit III	Types of services – Platforms - Building and Strengthening of social media.	4
Unit IV	Spamming in social networks – social aspects- Design Issues	3
Unit V	Growing Constituency through Social Media – A glance at social media Do's and Don'ts.	2
	Total Contact Hrs	**15**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments,Group Task.(Roll Play)

Web Reference

- https://www.usaid.gov/sites/default/files/documents/1866/SMGuide4CSO.pdf
- https://www.symantec.com/content/en/us/.../the_risks_of_social_networking.pdf

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT3N2			**Title**	**Batch:**	2023 - 2026
				Non-Major Elective -I : Hardware & Networking	**Semester:**	III
Lecture Hrs./Week	1	**Tutorial Hrs./Sem.**	-		**Credits:**	2

Course Objective

To make understand various concepts of processors, input / output hardware, communication channels, networks with their types etc.

Course Outcomes

CO Number	CO Statement	Knowledge Level
CO1	To recollect the basics of I/O hardware.	K1
CO2	To understand about working of processors.	K2
CO3	To implement a network operating system.	K3
CO4	To analyze different types of networks and topologies.	K4
CO5	To Determine the concepts of Hardware and Networks.	K5

Mapping

PO/PSO / CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	M	H	H	H	H	M	H	H	H	H	H
CO2	L	M	H	H	M	M	H	M	H	M	M	H
CO3	M	M	H	M	M	M	H	H	M	H	M	M
CO4	M	M	M	L	M	L	M	H	H	M	M	M
CO5	M	L	L	M	M	L	M	M	M	L	M	M

Units	Content	Hrs.
Unit I	**Processors:** Microchips, Miniaturization and Mobility - CPU and Main Memory - Microcomputer System Unit.	2
Unit II	**Input and Output Hardware:** Input Hardware - Keyboard Input- Pointing Devices - Output Hardware - Display Screens	3
Unit III	**Communication Channels:** Electromagnetic Spectrum -Twisted Pair - Coaxial Cable - Fiber Optic Cable – Microwave and Satellite Systems - Wireless Communications - Next Generation Wireless Communications.	4
Unit IV	**Communication Networks:** Types of Networks - Network Operating System - Host and Node - Servers and Clients – Advantages of Networks.	3
Unit V	**Local Networks:** N/W Types - Types of LAN's – Components – Topology - Impact of LAN.	3
	Total Contact Hrs.	**15**

Pedagogy :

Digital Presentation, Chalk and talk, Flipped class

Assessment Methods:

Seminar Quiz, Assignments

Text Book

- Williams, Sawyer and Hutchinson, (2001), *Using Information Technology - A Practical Introduction to Computers & Communications.* 3rd Edition. Tata McGraw Hill.

Reference Books

- https://www.usaid.gov/sites/default/files/documents/1866/SMGuide4CSO.pdf
- https://www.symantec.com/content/en/us/.../the_risks_of_social_networking.pdf

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT3VA			**Title**	**Batch:**	**2023-2026**
				VAC I:	**Semester:**	11I
Lecture Hrs./Week	30 Hrs.	**Tutorial Hrs./Sem.**	-	Cyber Security	**Credits:**	2**

Course Objective

On successful completion of this subject the students can understand various concepts of Cybercrime, security tips for email and smartphones etc.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To keep in mind the fundamentals of cyber security & crimes	K1
CO2	To understand the types of security mechanisms	K2
CO3	To apply and identify security measures, and various types of malwares and viruses	K3
CO4	To analyze security, privacy, and efficiency of a email	K4
CO5	To Assess the concepts of Antivirus and safety mechanisms.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	H	H	H	M	H	M	H	H	H	H	H
CO2	M	H	H	M	M	M	H	M	H	M	M	H
CO3	M	M	M	H	H	M	H	H	M	H	H	H
CO4	H	H	H	H	H	M	H	H	H	M	H	H
CO5	H	H	H	H	H	H	H	H	H	H	H	H

Units	Content	Hrs.
Unit I	Introduction to cybercrime: classification – reasons. **Malware and its types:** Adware – Spyware – Browser hijacking software – Virus – Worms – Trojan Horse – Scareware. Kinds of cybercrime – Authentication - Encryption	10
Unit II	Digital Signature – Anti-virus – Firewall – Steganography – Computer Forensics. Reporting Cybercrime – Recent Cybercrime incidents – Cyber security initiatives in India.	8
Unit III	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.	12
	Total Contact Hrs.	**30**

Pedagogy :

Digital Presentation, Chalk and talk, Flipped class.

Assessment Methods:

Seminar, Quiz, Assignments.

Text Book

- Dr. JeetendraPande, "Introduction to Cyber Security", Uttarakhand Open University, Haldwani, ISBN: 978-93-84813-96-3.

Reference Books

- ATUL KAHATE. (2013). *CRYPTOGRAPHY and NETWORK SECURITY*. 3rd Edition, McGraw-Hill Education Pvt Ltd.

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT412			**Title**	**Batch:**	2023 - 2026
				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	Knowledge Level
CO1	To recall basics of data communication and networking	K1
CO2	To demonstrate various types of networks and topologies	K2
CO3	To make use of routing algorithms	K3
CO4	To categorize different ways of accessing the internet	K4
CO5	To Compare various types of protocols(X.25,Frame relay,ISDN,ATM)	K4

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	-	M	M	H	H	-	H	-	-	-	-
CO2	H	M	M	M	M	H	-	H	H	H	-	H
CO3	M	M	H	M	H	H	H	H	-	-	-	H
CO4	M	H	H	H	M	H	H	H	H	H	-	H
CO5	H	-	M	H	H	H	H	H	-	H	-	-

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	**TransmissionErrors**: Detection and Correction –**TransmissionMedia**: Guided Media, Unguided Media. **NetworkTopologies**: 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:

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task(GD/ Roll Play /APS)

Text Book

- Achyut S.Godbole. (2007). *Data Communications and Networks.* Tata McGraw-Hill Publishing Company Limited, Ninth reprint

ReferenceBooks

- Behrouz A. Forouzan. (2007). *Data Communications and Networking*, 2nd Edition Update. Tata McGraw-Hill Publishing Company Limited, Nineteenth reprint.
- Andrew S. Tanenbaum. (2000). *Computer Networks.* 3rd Edition, Prentice Hall of India.

Web References:

- https://www.cisco.com/c/en_in/solutions/small-business/resource-center/networking/networking-basics.html
- https://www.techopedia.com/definition/7776/internet-access

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT413			**Title**	**Batch:**	2023 - 2026
				CC - VIII: Advanced Java Programming	**Semester:**	IV
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	**5**		**Credits:**	4

Course Objective

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

Course Outcome

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

CO Number	**CO Statement**	**Knowledge Level**
CO1	To recollect the knowledge of GUI based applications, Web based applications and Database applications.	K1
CO2	To understand development of the Internet programming through java programming.	K2
CO3	To apply different powerful GUI components from existing applications to create new web pages.	K3
CO4	To analysis different applications for solving the real time problems in Industry.	K4
CO5	To Prove the various concepts using problems.	K5

Mapping

PO/PSO / CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**
CO1	M	H	H	H	M	H	M	H	H	H	H	H
CO2	M	H	H	M	M	M	H	M	H	M	M	H
CO3	M	H	M	H	H	M	H	H	M	H	H	H
CO4	M	H	H	H	H	M	H	H	H	M	H	H
CO5	H	H	H	H	H	H	H	H	H	H	H	H

Units	Content	Hrs. L+T
Unit I	**Swing Basic Concepts:** JFC- The Swing and the AWT - Swing Packages - Structure of A Swing Application – Top - Level Swing Containers - Lightweight Swing Container - JComponent Class - Basic Swing Components - Swing Text Components. **Exploring Swing:** Menu Components -Space Saving Lightweight Containers - Advanced Components – Virtual Desktop Components -Advanced Text Component - New Layout Managers.	15+1
Unit II	**Java Beans**: Definition - Advantages - Application Builder Tools - Using The Bean Development Kit (BDK) - JAR Files - Developing a Simple Bean Using the BDK - Using Bound Properties - Using the Bean info Interface - Constrained Properties - Persistence - Customizers - The Java Bean API - Using Bean Builder.	14+1
Unit III	J**DBC:** Architecture - JDBC-ODBC Relationship – Types of Drivers – Components - Interfaces and classes - Steps for Querying the Database with JDBC - Creating an ODBC Data source - Querying and updating Database Tables - passing parameters to a statement. **Servlets**: Introduction-Architecture - Designing - Servlet generating Plain Text, HTML - Handling GET Request.	13+1
Unit IV	**Cookies**: Overview of cookies – Servlet cookie API – Read, Use, Send cookies in a Servlet, Get client's address in a Servlet – Hit counterexample.**JSP:** Introduction – Scripting elements - life cycle.	14+1
Unit V	J**STL Tags**: Overview – EL Support – i18n support - Database Support (SQL Tags) – XML support. **AJAX:** Introduction – working concepts - Benefits - Role of Ajax in enhancing the user experience on the web - Rich internet application - What can Ajax do? - Impact of Ajax on user experience - on mobile - Traditional means of web application development - Web application development - Data exchange - Advantages and disadvantages - Web framework XML HTTP request object – Examples (First Program and Login Form).	14+1
	Total Contact Hrs.	**75**

Pedagogy :

Digital Presentation, Chalk and talk, Flipped class.

Assessment Methods:

Seminar, Test, Assignment, Group task.

Text Books:

- ISRD Group, (2007), *Introduction to Object Oriented Programming through Java*, Tata McGraw-Hill Publishing Company Limited, New Delhi. (Units I, III).
- Herbert Schild**,** (2002), *JavaComplete Reference*, 5th Edition, Tata McGraw Hill Pub (Unit II).
- S. Padma Priya, (2011), *Web Technology*, Scitech Pub (Units IV, V).

Reference Book:

- RashimMogha, V.V. Preetham,(2010), *Java Web Services Programming*, Willy India Pub.

Web References:

- https://www.javatpoint.com/servlet-tutorial\
- https://www.softwaretestinghelp.com/java-components-java-platform-jdk/

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: R. Sekar Signature:	Name: K. Vijayakumar Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT4A1			**Title**	**Batch:**	2023 - 2026
				GE IV – Allied IV : Software Engineering	**Semester:**	IV
Lecture Hrs./Week	5	**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	Knowledge Level
CO1	To recollect the various process models, requirements, Designs, Quality, Testing.	K1
CO2	To Understand the software development phases.	K2
CO3	To apply concepts into the testing lab.	K3
CO4	To evaluate the expected result with testing output.	K4
CO5	To justify the concepts of software development and testing phase.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	H	H	H	H	M	H	H	H	M	M
CO2	H	M	H	H	M	M	H	M	H	M	M	H
CO3	M	H	H	H	M	H	H	M	M	H	H	M
CO4	M	M	M	M	M	M	M	H	H	M	M	M
CO5	M	M	L	H	M	M	M	M	M	L	M	M

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.	16
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.	14
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.	15
Unit IV	**Quality Concepts:** Software Quality-Dilemma-Achieving Software Quality. **Software Quality Assurance:** Elements – Tasks, Goals and metrics – Statistical SQA – Software reliability – SQA plan**.**	15
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.	15
	Total Contact Hrs.	**75**

Pedagogy:

Digital Presentation, Chalk and talk, Flipped class

Assessment Methods:

Seminar, Quiz, Assignment, Group task.

Text Books

- Roger S. Pressman ,(2019), *Software Engineering-A Practitioner's Approach*, 8th Edition, McGraw-Hill International Pub.
- Jeffrey A. Hoffer, Joey F. Georgr, Joseph S. Valacich , (2000), "*Modern Systems Analysis and Design*", 2nd Edition, Pearson Education publications. (Unit II – DFD, ER).

Reference Books

- Richard Fairley, (2010), *Software Engineering Concepts*, 33rd Reprint, Tata McGraw-Hill Publishing Company Limited.
- PankajJalote , (2001), *An Integrated Approach to Software Engineering*, 3rd Edition Narosa Publication.

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
.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT4A2			**Title**	**Batch:**	2023 - 2026
				GE IV – Allied IV : Software Project Management	**Semester:**	IV
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

To Understand the Project Management and project evaluation, Effort estimation, Resource allocation, contract management and software quality.

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Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To recollect the various activities of Software Project Management.	K1
CO2	To Understand the Activity plan and Risk Management.	K2
CO3	To apply concepts of Resource Allocation.	K3
CO4	To evaluate the Management contracts and Organizing Terms.	K4
CO5	To justify the Quality of the software development.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	H	H	H	H	M	H	H	H	M	M
CO2	H	M	H	H	M	M	H	M	H	M	M	H
CO3	M	H	H	H	M	H	H	M	M	H	H	M
CO4	M	M	M	M	M	M	M	H	H	M	M	M
CO5	M	M	L	H	M	M	M	M	M	L	M	M

Units	Content	Hrs.
Unit I	**Introduction to Software Project management:** Introduction –Importance – Meaning of a Project – Software project versus other types of project – Contract Management and technical project management – Activities covered – plans, methods, and methodologies – some ways of categorizing software projects. Stepwise: an overview of project planning. **Programme Management and Project Evaluation:** Programme Management – Managing the Allocation of resources within programmes – strategic programme management – creating a programme – aids to programme management – Benefits Management – Evaluation of Individual projects – technical assessment – cost-benefit analysis - cash flow forecasting – cost-benefit evaluation techniques – risk evaluation.	16
Unit II	**Software Effort Estimation:** Estimation – Problem with over and Under-estimates – basis for software estimating – software effort estimation techniques – Expert judgment – estimating by analogy. **Activity Planning:** The objectives – planning – Project schedules – project and activities – sequencing and scheduling activities – **Network:** Planning models – formulating a network model – adding time dimension – forward pass – backward pass. **Risk Management:** Risk – Categories – Dealing with risk – Risk identification, assessment, planning and management – Evaluating risk to schedule.	14
Unit III	**Resource Allocation:** Introduction - Nature of resources – identifying the resource requirements – scheduling resources – creating critical path – counting the cost – being specific – publishing the resource schedule – cost schedules – scheduling the sequence. **Monitoring and Control:** Creating framework – collecting the data – visualizing progress – cost monitoring – earned value analysis – prioritizing monitoring – getting the project back to target – change control.	15
Unit IV	**Managing Contracts:** ISO 12207 approach – supply process – types of contract – stages in contract placement, management – acceptance. **Managing People and Organizing Terms:** understanding behavior – organizational behavior – selecting the right person for the job – instruction in the best methods – Motivation – Working in groups – becoming a team – decision making – Leadership – organizational structures – dispersed and virtual teams - influence of culture – stress – health and safety.	15
Unit V	**Software Quality:** The place of software quality in project planning – importance of software quality – defining software quality – ISO 9126 - practical software quality measures – product vs process quality management – external standards – techniques to help enhance software quality- quality plans. Small Projects: Introduction – Some problems with student projects – content of a project plan – conclusion.	15
	Total Contact Hrs.	**75**

Pedagogy:

Digital Presentation, Chalk and talk, Flipped class

Assessment Methods:

Seminar, Quiz, Assignment, Group task.

Text Books

- Bob Hughes & Mike Cotterell,(2005). *SOFTWARE PROJECT MANAGEMENT*, 4th Edition, PHI Publications.

Reference Books

- PankajJalote, (2002), *SOFTWARE PROJECT MANAGEMENT IN PRACTICE*, Pearson Education Asia.
- 2. Kieron Conway, (2000). *SOFTWARE PROJECT MANAGEMENT FROM CONCEPT TO DEPLOYMENT*, Dream Tech Press.

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Web Reference:

- https://www.javatpoint.com/software-project-management
- https://en.wikipedia.org/wiki/Software_project_management

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT414			**Title**	**Batch:**	2023 - 2026
				CC Lab. – V: Programming in Advanced Java	**Semester:**	IV
Practical Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	2

Course Objective

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

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To apply the different components of java programming.	K3
CO2	To analysis the concepts to enhance in the application level.	K4
CO3	To validate the user friendliness and desire performance implied for given input.	K5
CO4	To test the different components of Advanced Java using programs.	K6
CO5	To create connectivity using database.	K6

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M	L	M	H	H	L	L	L	M	M
CO2	H	M	H	M	H	M	M	L	H	M	L	L
CO3	H	H	M	L	L	L	H	L	M	H	L	M
CO4	H	H	H	M	M	M	M	L	M	M	L	L
CO5	H	H	M	L	L	L	H	L	M	H	H	M

Contents	Hrs.
Test I 1. Develop JCheckBox 2. Develop a Menu 3. Develop Program for swing 4. DevwlopJTabbedPane 5. Create Function of JTree 6. Create JScrollPane using swing **Test II** 7. Develop a Generic Servlet. 8. Implement JDBC using Servlet. 9. Develop a Javabean to create Juggler Bean. 10. Generate simple property Javabean	**75**

Pedagogy:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Quiz , Group task(GD/Role play/abs).

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT4S1			**Title**	**Batch:**	2023 - 2026
				SEC II : Naan Mudhalvan : Advanced Excel Lab.	**Semester:**	IV
Practical Hrs./Week	2	**Tutorial Hrs./Sem.**	-		**Credits:**	2

Course Objective

To manipulate data lists using advanced functions to summarize and report results from multiple worksheets.

Course Outcomes

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

CO	CO Statement	Knowledge
CO1	To applystatistical functions	K3
CO2	To apply concept of date functions	K4
CO3	To verify Lookup and financial functions	K5
CO4	To verify Manipulation of database and pivot functions	K5
CO5	To create advanced filtering in excel	K6

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO 9	PO10	PSO 1	PSO2
CO1	L	M	M	L	L	M	M	L	L	H	L	M
CO2	L	M	L	L	L	L	H	L	H	H	L	M
CO3	L	M	M	L	L	M	M	M	H	H	L	M
CO4	L	M	L	L	L	L	H	L	H	H	L	M
CO5	L	M	M	L	L	M	M	L	L	H	L	M

Content	Hrs.
SAMPLE PROGRAM LIST **Test I** 1. Inserting Basic Math And StatisticsFunctions 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	**30**

Pedagogy:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Task(GD)

Course Designed by	Verified by HOD	Checked by	Approved by
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Name: C.R. Durga devi Signature:	Name: K.Vijayakumar Signature:	Name: Mr. K. Srinivasan Signature:	Name:Dr. R. Manickachezian Signature:

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Programme Code:	B.Sc. - IT			**Programme Title:**		Information Technology	
Course Code:	23UIT4S2			**Title**		**Batch:**	2023 - 2026
				SEC II : Naan Mudhalvan : Quantitative Aptitude.		**Semester:**	IV
Practical Hrs./Week	2	**Tutorial Hrs./Sem.**	5			**Credits:**	2

Course Objective

To enable the students to refine their mathematical, logical, and analytical skills**,** to answer real-life simple problems by using HCF and LCM.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To have fundamental **knowledge** of Mathematics about problems of numbers using Mathematical formulae.	K1
CO2	To **understand** the concepts of profit & loss related processing, simplification, etc.,	K2
CO3	To **apply** the formulae to real time problems on probability, Areas of surfaces and **apply** data visualization tool for any data set.	K3
CO4	To **analyze** the problems solving related to Age, Time and Distance and Time and Work etc.	K4
CO5	Use their logical thinking and analytical abilities to **evaluate** puzzle and decision making related questions from company specific and other competitive tests	K5 K6

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	M	M	L	H	M	M	M	M	M	M
CO2	H	L	H	M	M	M	L	M	M	M	M	M
CO3	H	H	M	M	L	H	H	H	L	H	M	H
CO4	H	M	H	H	H	M	H	H	H	H	L	H
CO5	M	M	L	H	M	H	M	M	M	M	H	M

Units	Content	Hrs
UnitI	Numbers-HCF And LCM of Numbers-Decimal Fractions- Comparison of Fractions - Simplification- Square Root and Cube Roots – Average.	6
UnitII	Time and Work - Time and Distance – Mixtures or Allegations - Problems on Numbers - Problems on Ages –Percentage - Profits and Loss.	6
Unit III	Ratio and Proportion - Time and Work - Time and Distance - Simple Interest - Compound Interest - Area-Volume and Surface Area.	6
UnitIV	Permutation and Combination - Probability, Height and Distances - Boats and Streams - Odd Man Out &Series.	6
UnitV	Interpretation: Tabulation, Bar Graphs, Pie Chart, Line Charts.	6
	Total Contact Hrs	**30**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods:

Seminar, Quiz, Assignments, GroupTask.

Text Books

- R.S. Aggarwal(2018). Quantitative Aptitude for Competitive Examinations S.Chand& Company Ltd., New Delhi.

Reference Books

- Dinesh Khattar (2013). The Pearson Guide to Quantitative Aptitude for Competitive ExaminationsPearson's Publications, New Delhi. 2nd Edition.
- Praveen R.V (2016). Quantitative Aptitude and Reasoning PHI Learning Pvt. Ltd., New Delhi. 3rd Edition

Web Reference:

- https://www.javatpoint.com/aptitude/quantitative
- https://www.tutorialspoint.com/quantitative_aptitude/index.htm

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT4N1			Title	Batch:	2023 - 2026
				Non Major Elective – II: Data Analytics	Semester:	IV
Lecture Hrs./Week	1	Tutorial Hrs./Sem.	-		Credits:	2

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	Knowledge Level
CO1	To keep in mind the basic understanding of fundamentals of data analytics	K1
CO2	To understand the types of data analytics	K2
CO3	To apply the tools in various domain	K3
CO4	To identify career opportunities	K4
CO5	To interpret technical skill of data scientist	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	H	-	L	L	L	H	-	H	L	L	H
CO2	H	L	M	H	-	L	L	H	H	M	-	L
CO3	H	L	M	M	-	L	L	M	H	M	-	H
CO4	L	M	L	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

Units	Content	Hrs.
Unit I	Data analytics: Introduction – Importance - Types of analytics	3
Unit II	Common Terminologies - Tools and basic prerequisites	3
Unit III	Advanced Tools – Workflow	3
Unit IV	Applications: Industries – Business Functions	3
Unit V	Career in analytics: Data scientist - Life of a data scientist - become a data scientist - Technical skills - Career path in analytics.	3
	Total Contact Hrs.	**15**

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Seminar, Quiz, Assignments

Web References:

- https://data36.com/data-analytics-basics-intro/
- https://blog.k2datascience.com/the-basics-of-data-analytics-77e5cc7ea741
- https://www.jigsawacademy.com/em/Beginners_Guide_to_Analytics.pdf

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT4N2			Title	Batch:	2023 - 2026
				Non Major Elective - II : Computer Security	Semester:	IV
Lecture Hrs./Week	1	Tutorial Hrs./Sem.	-		Credits:	2

Course Objective

To understanding of various concepts of data security, cryptography, substitution techniques, encryption, decryption etc.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To find the basic fundamentals of data security	K1
CO2	To illustrate the concepts of ciphers and cryptography methods	K2
CO3	To organize the idea of encryption and decryption methods	K3
CO4	To discover basic issues in data security	K4
CO5	To compare substitution and Transposition techniques	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	-	-	M	-	H	H	H	M	H	M	-	H
CO2	M	-	H	-	H	H	M	M	M	-	-	H
CO3	-	M	H	H	-	H	M	H	M	M	-	H
CO4	-	M	H	-	H	H	H	H	H	M	-	H
CO5	M	-	M	H	-	H	M	M	-	M	-	-

Units	Content	Hrs.
Unit I	Introduction-The need for security- Security Approaches: Trusted system.	3
Unit II	Security models-Security management practices- Principles of security.	3
Unit III	Cryptography : Concepts and Techniques - Introduction-Plain text and Cipher text	3
Unit IV	Substitution Techniques : Caesar cipher-Mono Alphabetic cipher-Homophonic substitution cipher-Polygram substitution cipher	3
Unit V	Transposition Techniques: Rail fence-Simple Columnar. Encryption and Decryption	3
	Total Contact Hrs.	**15**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD/ Roll Play /APS)

Text Book

- AtulKahate. (2009). *Cryptography and Network Security*, 2nd Edition.

Reference Books

- William Stallings. (2006). *Cryptography and Network Security Principles and Practices*. 4th Edition. PHI Education Asia.
- Behrouz A. Forouzan. (2007). *CRYPTOGRAPY and NETWORK SECURITY*. Tata McGraw Hill Pub.

Web References

- www.tutorialspoint.com
- https://vivadifferences.com/difference-between-substitution-cipher-technique-and-transposition-cipher-technique/

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT4VA			**Title**	**Batch:**	2023 - 2026
				VAC II : Social Networks	**Semester:**	IV
Lecture Hrs./Week	30 Hrs.	**Tutorial Hrs./Sem.**	-		**Credits:**	2**

Course Objective

To provide the overall view of various concepts of Social media such as Facebook, Twitter, LinkedIn, Instagram, etc.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To keep in mind basics of Social Networks	K1
CO2	To understand the classification of Social Media	K2
CO3	To deploy various data privacy feature in social media platforms	K3
CO4	To analyze the security aspects in social media.	K4
CO5	To assess the various social media platforms.	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	-	M	H	M	H	-	L	H	H	M	-	M
CO2	-	M	H	M	H	-	L	M	H	M	-	M
CO3	-	H	H	H	H	-	M	M	H	H	-	M
CO4	-	H	H	H	H	-	M	M	H	H	-	M
CO5	-	L	H	M	H	M	M	M	H	H	-	M

Units	Content	Hrs.
Unit I	**Social Networks:** Introduction- Class Overview- Learning in Social Networking – Finding Social Networks - Popular Social Networks - Online Safety Tips - Personal Information - Online Best Practices.	12
Unit II	FACEBOOK: Introduction - Setting Up Your Profile - Privacy - Making 'Friends' TWITTER: Introduction – Working – Benefits.	9
Unit III	LINKEDIN: Introduction - Adding Connections. OTHER SOCIAL NETWORKING SITES – Google+ - Pinterest – Myspace – tumblr – Googlereads – Instagram.	9
	Total Contact Hrs.	**30**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(Role Play)

Web Reference

- https://www.usaid.gov/sites/default/files/documents/1866/SMGuide4CSO.pdf
- https://www.symantec.com/content/en/us/.../the_risks_of_social_networking.pdf

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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT515			Title	Batch:	2023 - 2026
				CC – IX : Information 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	Knowledge Level
CO1	To Recollect basic concepts of network security	K1
CO2	To Understand basic knowledge of cryptography	K2
CO3	To Apply diverse security mechanisms	K3
CO4	To Evaluate various security algorithms	K4
CO5	To Interpret different types of protocols	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	-	L	L	L	H	-	H	L	L	H
CO2	H	L	M	L	-	L	L	H	M	M	-	H
CO3	H	L	M	H	-	L	L	M	H	M	-	H
CO4	L	M	L	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

Units	Content	Hrs.
Unit I	**Security:** Introduction – Need – Approaches – Principles – **Types of attacks*. **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 II	**Symmetric Key Algorithms**: Introduction - **Algorithm Types and modes* – Overview – DES– IDEA– RC4 & 5 – Blowfish – AES.	14
Unit III	**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
Unit IV	**Digital Certificates:** Introduction – Concepts – **Certification Authority* – Technical details – Creation – Cross certification – Revocations. **Private key management - PKIX model** – **PKCS**.	15
Unit V	**Internet Security Protocols:** Introduction – Concepts. **Secure Socket Layer** (SSL): **Transport Layer Security** (TLS) – **Secure Hyper Text Transfer Protocol** (SHTTP) – **Time Stamping Protocol** (TSP). **Secure Electronic Transaction (SET):** Introduction – Participants – Process – Internals. SSL Versus SET – 3-D secure Protocol. **Electronic Money:** Introduction – Security mechanisms – Types. **Email security**: Introduction – Privacy Enhanced Mail – Pretty Good Privacy. WAP Security - Security in GSM – Security in 3G.	15
	Total Contact Hrs.	**75**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD)

Text Book

- ATUL KAHATE. (2013). *CRYPTOGRAPHY and NETWORK SECURITY*. 3rd Edition, McGraw-Hill Education Pvt Ltd.

Reference Books

- William Stallings. (2006). *Cryptography and Network Security Principles and Practices*. 4th Edition. PHI Education Asia.

- Behrouz A. Forouzan. (2007). *CRYPTOGRAPY and NETWORK SECURITY*. Tata McGraw Hill Pub.

Web References

- https://www.youtube.com/watch?v=edQIJvaUhHg
- https://www.youtube.com/watch?v=9OjK9NNlXYY
- https://www.youtube.com/watch?v=NK5Z6Oj0YkM

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT516			**Title**	**Batch:**	2023 - 2026
				CC – X : Visual Programming	**Semester:**	V
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	5		**Credits:**	4

Course Objective

Tounderstand the various concepts of C#.Net and Visual Basic .Net (Data types, Properties, Components, Inheritance, Polymorphism, Database Connectivity and Web Services).

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To recall various statements, data types, properties, components, Indexes, Events and Attributes, etc.	K1
CO2	To Understand the basic structure of VB.Net& C#.Net and features of IDE.	K2
CO3	To make use of the basic concepts of Methods, Arrays, I/O Streams, Database Connectivity and Web Services.	K3
CO4	To analyze the various controls of OOPs, Windows Applications and Web Services.	K4
CO5	To prove the concepts into the Lab. programs.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M	-	-	M	M	-	-	M	-	-
CO2	M	H	M	-	-	M	M	-	-	M	-	H
CO3	H	H	H	H	-	M	H	M	H	H	-	-
CO4	H	H	M	-	M	M	M	-	-	H	-	H
CO5	H	H	H	H	M	M	H	M	H	H	-	H

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
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
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.	15+1
Unit IV	**VB.NET**: Essentials – Operators **-** conditionals and loops – Procedures, Scope and Exception handling – Windows Forms - Text Boxes, Rich Text Boxes, Labels and Link Labels – Buttons **-** Checkboxes, Radio buttons, Panels and Group boxes.	15
Unit V	List boxes, Checked List Boxes, Combo boxes and Picture boxes – Scroll bars, Splitters, Track Bars, Pickers, Notify Icons, Tool Tips and Timers– Menus, Built-in Dialog boxes and printing– Image lists, Tree and List views, Toolbars, Status and progress Bars and tab. **Database Access with ADO.Net.** **Case Study:** Develop a unique application using this course.	15+1
	Total Contact Hrs.	**75**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD/ Roll Play /APS)

Text Book

- Muthu C. (2008). *Visual C#.Net.* First Reprint. Tata Mc-Graw Hill Pub.
- Steven Holzner (2008) Visual Baisc.Net Programming Black Book- -Dream Tech Publication.

Reference Books

- Kogent learning solutions (2011) *ASP.NET 4.0 in Simple Steps*- -Dream Tech Press Publication.
- Padmapriya .S (2011) *Web Technology* - Scitech Publications.

Web References

- https://www.tutorialsteacher.com/csharp/first-csharp-program
- https://www.tutorialspoint.com/vb.net/index.html.

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT5E1			**Title**	**Batch:**	2023 - 2026
				DSE- I : Data Mining	**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	Knowledge Level
CO1	To keep in mind the various basic concepts of data mining	K1
CO2	To understand different types of data mining to be applied in various domain areas	K2
CO3	To execute data mining algorithms for finding hidden interesting patterns in data.	K3
CO4	To evaluate various data mining algorithms to solve real world problems	K5
CO5	To judge the pros and cons in handling Mining types.	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	L	M	H	H	H	M	H	H
CO2	L	M	M	H	L	M	M	L	H	L	H	H
CO3	M	M	M	H	L	L	L	L	H	L	M	M
CO4	H	H	H	H	L	M	M	M	H	L	M	M
CO5	L	M	M	M	H	L	M	H	H	M	M	M

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.	16
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.*	14
	Total Contact Hrs ***Self Study**	**75**

Pedagogy:

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD/ Roll Play /APS)

Text Book

- Jiawei Han and Micheline Kamber (2005) Data Mining concepts and techniques, Elsevier publication.

Reference Books

- Vikram Pudi, P.Radha Krishna (2009), *Data Mining***,** Oxford University Press, 1st Edition.
- Anand Rajaraman and Jeffry David Ullman (2012), "Mining of Massive Datasets", Cambridge University Press.

Web References

- https://youtu.be/m5c27rQtD2E
- https://youtu.be/6FWIez4lP68

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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT5E2			Title	Batch:	2023 - 2026
				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	Knowledge Level
CO1	To recollect cloud networking concepts	K1
CO2	To understand and familiar with the basic concepts of cloud computing and python	K2
CO3	To apply the terminologies in designing cloud based applications	K3
CO4	To figure out security issues in cloud computing	K4
CO5	To judge the pros and cons of various types of cloud providers	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	M	M	M	M	H	H	H	H	H
CO2	H	H	H	M	L	M	M	H	H	H	H	H
CO3	M	H	H	H	M	L	M	H	H	H	H	H
CO4	L	M	H	H	H	L	M	H	H	H	H	H
CO5	L	H	H	L	M	L	M	H	M	M	M	M

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. **Hadoop and MapReduce:** Apache Hadoop – MapReduce Job execution – Schedulers – Cluster setup.	14
Unit III	**Cloud Application Design:** Introduction **–** Design considerations – Reference Architectures – Design methodologies – Data storage approaches. **Cloud Application Benchmarking and Tuning**: Introduction – Workload Characteristics – Application Performance Metrics – Design Considerations – Benchmarking Tools – Deployment prototyping – Load Testing and Bottleneck Deduction – Hadoop Benchmarking.	16
Unit IV	**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.	15
Unit V	**Python Basics:** Introduction – Installation – Data types and Data structures –Control flow – Functions – Modules – Packages – File handling – Date/Time – Operations – Classes. **Python for Cloud:** Amazon web services – Google Platform – Windows Azure – MapReduce – Packages – Web Application Framework – Designing a RESTful Web API.	14
	Total Contact Hrs.	**75**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(Roll Play)

Text Book

- ArshdeepBahga, Vijay Madisetti. (2016). Cloud Computing – A Hands-on Approach. Universities Press Pvt. Ltd.

Reference Books

- Anthony T.Velte, Toby J.Velte, Robert Elsenpeter. (2013). Cloud Computing - A Practical Approach. McGraw Hill Publications. Fourteenth reprint.
- Michael Miller. (2009). Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing.

Web Reference

- https://www.youtube.com/watch?v=RziNWUlBPPM
- https://www.youtube.com/watch?v=rjY59WLMK2o

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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT5E3			Title	Batch:	2023 - 2026
				DSE - I : Wireless Networks	Semester:	V
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

To understand various concepts transmission techniques, adhoc networks and wireless sensor networks

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To recollect analog and digital transmission	K1
CO2	To understand and familiar in wireless LAN and WPAN	K2
CO3	To apply sensor network in various scenarios	K3
CO4	To figure out challenges in wireless networks	K4
CO5	To judge design principles of wireless networks	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	M	M	M	M	H	H	H	H	H
CO2	H	H	H	M	L	M	M	H	H	H	H	H
CO3	M	H	H	H	M	L	M	H	H	H	H	H
CO4	L	M	H	H	H	L	M	H	H	H	H	H
CO5	L	H	H	L	M	L	M	H	M	M	M	M

Units	Content	Hrs.
Unit I	Evolution of wireless networks – Challenges - Transmission fundamentals: Analog and digital data transmission - Transmission media - Modulation techniques for wireless systems - Multiple access for wireless systems - Performance increasing techniques for wireless networks.	16
Unit II	Introduction to Wireless LANs – WLAN Equipment, Topologies, Technologies, IEEE 802.11 WLAN – Architecture and Services - Physical Layer - MAC Sub Layer –MAC Management Sub Layer, Other IEEE 802.11 Standards.	14
Unit III	Introduction – Bluetooth: Architecture - Protocol Stack - Physical Connection – Mac mechanism – Frame format – Connection management –Low Rate and High Rate WPAN, ZigBee Technology IEEE 802.15.4: Components – Network topologies – PHY – MAC.	16
Unit IV	Introduction- Characteristics of Adhoc Networks - Classifications of MAC Protocols: Connection Based protocols, Reservation Mechanism - Table driven Routing protocols: DSDV, WRP - On Demand routing protocols: DSR,AODV,TORA –Routing Protocol with Efficient Flooding Mechanism: OLSR - Hierarchical routing protocols – CBRP, FSR.	15
Unit V	Introduction - Challenges for wireless sensor networks - Comparison of sensor network with ad-hoc network - Single node architecture: Hardware components - Energy consumption of sensor nodes - Network architecture: Sensor network scenarios - Design principles – Operating systems.	14
	Total Contact Hrs.	**75**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(Roll Play)

Text Book

- Nicopolitidis P. (2010). Wireless Networks. John Wiley and Sons, New York.
- Vijay K Garg, (2010). Wireless Communication and Networking, Morgan Kaufmann Publishers.
- Siva Ram Murthy C, Manoj B S. (2012).Ad Hoc Wireless Networks: Architectures and Protocols, Prentice Hall.

Reference Books

- Holger Karl and Andreas Willig. (2011) Protocol and Architecture for Wireless Sensor Networks, John Willey Publication.
- KavehPahlavan. 2013). Principles of wireless networks. Prentice-Hall of India.

Web Reference

- https://www.youtube.com/watch?v=HjAxGPd0Oto
- https://www.youtube.com/watch?v=pH_ip22R6xE

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT517			**Title**	**Batch:**	2023 - 2026
				CC Lab - VI : Visual Programming	**Semester:**	V
Practical Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	2

Course Objective

To understand the practical experience in various concepts of C#.Net and VB.NET (Data types, Statements, Properties, Inheritance, Polymorphism, Multithreading, and Database Connectivity and Web Services).

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To experiment the concepts of web oriented programs.	K3
CO2	To motivate to create menu based program for basic manipulation	K4
CO3	To create applications using database connectivity	K6
CO4	To Test the field elements using validator control	K6
CO5	To design the data in grid control	K6

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	M	H	M	M	H	M	M	H	-	-
CO2	H	H	M	H	M	M	H	M	H	H	-	H
CO3	M	M	M	M	-	-	M	M	-	-	-	H
CO4	H	H	M	-	**M**	-	M	M	-	-	-	H
CO5	H	H	M	M	-	**M**	M	M	-	**H**	-	-

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). 10. Experiment the student details using ADO.Net. **TEST II (VB.NET)** 1. Create string handling function. 2. Create exception handling. 3. Generate program using VB.Net operators. 4. Create window application using text box, Rich text box 5. Create an application using button controls (check, radio, Panel). 6. Create an application using List boxes, Checked List boxes, Combo boxes and picture boxes). 7. Create an application using form controls and perform basic Manipulations. 8. Create a window application with list box, tables and panels. 9. Create application using Scroll bars, Spliters, Track bars, Pickers, Timers). 10. Create application using Image lists, Tree and list views, tool Bars, Status and Progress Bars and tab).	**75**

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group task (Group Discussion)

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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT518			Title	Batch:	2023 - 2026
				CC Lab - VII : Software Testing & Data Visualization Tools	Semester:	V
Practical Hrs./Week	5	Tutorial Hrs./Sem.	--		Credits:	2

Course Objective

To gain the knowledge to apply the various programming concepts of Software testing like integration, unit, functional, non-functional testing and about product metrics.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To make use of properties for checking the values	K3
CO2	To justify the expected result with the obtained result.	K5
CO3	To create GUI based database applications to test	K6
CO4	To develop test cases for the testing programs	K6
CO5	To test websites using selenium controls	K6

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M	H	-	-	M	-	M	H	-	H
CO2	-	H	-	H	-	M	-	M	H	H	-	H
CO3	H	H	M	H	-	H	-	-	-	H	-	H
CO4	-	H	-	H	-	H	M	M	M	M	-	-
CO5	H	H	M	H	-	M	-	-	M	M	-	-

Content	Hrs.
SAMPLE PROGRAM LIST **Test I Using Winrunner** 1. Create a payroll system and test using the tool. 2. Create a ration shop management system and test using the tool. 3. Create airline reservation system and test using the tool. **Using data visualization tool** 4. Using the Data sheet, create a vertical bar chart of the main sources of household light in a region. 5. Using Data sheet, create a stacked bar chart of each district's main sources of cooking fuel. 6. Once again using Data sheet, create a pie chart of the main sources of household light in a particular region. **Test II 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". 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** 6. Using the Data sheet, create a line graph of the infant mortality rate in a particular region. 7. Using the Data sheet, create a scatter plot of the relationship between illiterate population and marginal workers for Indian towns. 8. Create a word cloud of the incident locations in India between 1997 and 2015.	75
Total Contact Hrs.	**75**

Pedagogy:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Discussion

Web references:

- https://www.educba.com/winrunner/
- https://www.slideshare.net/mansirajpara/win-runner-testing-tool

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT5S1			Title	Batch:	2023 - 2026
				SEC III – Naan Mudhalvan : Graphic Designing Lab. (Photoshop)	Semester:	V
Practical Hrs./Week	4	Tutorial Hrs./Sem.	-		Credits:	2

Course Objective

To Learn, Apply and Create various editing techniques of Photoshop.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To deploy basic tools for designing photos.	K3
CO2	To examine various editing tools.	K4
CO3	To choose manipulation of text with photos.	K5
CO4	To verify filters and layers	K5
CO5	To create pdf document	K6

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	L	L	L	H	M	M	-	M	-	M
CO2	-	M	L	M	-	M	M	L	L	L	-	M
CO3	M	M	M	M	-	H	-	M	-	-	-	L
CO4	M	M	H	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

Content	Hrs.
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:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments ,Group Task (GD)

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT5S2			**Title**	**Batch:**	2023 - 2026
				SEC III – Naan Mudhalvan : Graphic Designing Lab. (Canva)	**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	Knowledge Level
CO1	To deploy basic tools for designing photos.	K3
CO2	To examine various editing tools.	K4
CO3	To choose manipulation of text with photos.	K5
CO4	To verify filters and layers	K5
CO5	To create PDF document	K6

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	L	L	L	H	M	M	-	M	-	M
CO2	-	M	L	M	-	M	M	L	L	L	-	M
CO3	M	M	M	M	-	H	-	M	-	-	-	L
CO4	M	M	H	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

Content	Hrs.
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:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments ,Group Task (GD)

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT5AL			**Title**	**Batch:**	2023 - 2026
				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	Knowledge Level
CO1	To remember the concepts of cyber law and cyber space	K1
CO2	To understand cyber security technical aspects	K2
CO3	To apply different types of technical evidence aspects	K3
CO4	To evaluate the electronic data interchange scenario	K4
CO5	To determine information technology act	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	L	L	L	H	M	M	-	M	-	M
CO2	-	M	L	M	-	M	M	L	L	L	-	M
CO3	M	M	M	M	-	H	-	M	-	-	-	L
CO4	M	M	H	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

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.

Assessment Methods:

Test, Quiz, Assignments

Text Books:

- Suresh T.Viswanathan, (2022), "The Indian Cyber Law", 3rd Edition: Bharat Law House, New Delhi

Reference Books:

- Cory Altheide and Harlan Carvey, (2011) "Digital Forensics with Open Source Tools", Elsevier.
- BillNelson,AmeliaPhilips,ChrisSteuart (2015) "GuidetoComputer ForensicsandInvestigations", 5th Edition, CENGAGE Learning.

Web References:

- https://www.youtube.com/watch?v=KtuCsBlJXk8
- https://www.youtube.com/watch?v=6srnawS4PLQ&list=PLX0Im12KwTwlm-jOWfFqejg8go7JBj72J
- https://www.youtube.com/watch?v=SCgc55vtd6M

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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT619			Title	Batch:	2023 - 2026
				CC - XI : Python Programming	Semester:	VI
Lecture Hrs./Week	6	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	Knowledge Level
CO1	To recollect basic programming concepts	K1
CO2	To understand and familiar with the basic coding in python	K2
CO3	To apply python terminologies for developing applications in small scale	K3
CO4	To figure out advanced concepts in python for developing web based applications	K4
CO5	To assess the data analysis tools usage in python.	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	L	L	L	M	M	L	L	M	M	M
CO2	H	H	L	L	L	M	M	L	L	M	M	M
CO3	H	H	L	L	L	M	H	M	L	L	L	L
CO4	H	H	H	L	L	L	H	H	H	H	M	M
CO5	L	L	M	H	M	L	M	L	H	H	M	M

Units	Content	Hrs.
Unit I	**Python Basics – I**: Introduction –Basic Concepts .**Python Basics – II** : Introduction – Data types – Mutable Vs Immutable-Input to python-Modular Programming and python Modules.	17
Unit II	**Operators in python- Functions:** Introduction-Need-Basics-Defining functions-Passing Variables- Function Arguments-Additional note on Modules-Special functions.	18
Unit III	**Flow control** – **Strings:** Creation, Initialization and Accessing elements- Traversing – String Operations-Difference between function, method and Attributes – **Lists:** Introduction-Basic concepts-Creating, Traversing and slicing Lists- List Functions and Methods- Nested list and using them as matrix.	18
Unit IV	**Dictionaries:** Introduction- Basics- Concepts-Functions and Methods-Dictionary Methods-View Objects. **Tuples:** Introduction-Basic concepts-Additional topics-**Regular Expression**: Basic concepts- Special characters, Groups of characters and Anchors-Understanding Re Module- Match object-Important Methods.	18
Unit V	**File Operations:** Introduction – Basics –Reading and Writing- **Advanced concepts. Pandas: Open Source Data Analysis and Manipulation Tool:** Introduction-Basics- Using Pandas for files.	19
	Total Contact Hrs.	**90**

Pedagogy :

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments

Text Book:

- Anurag Gupta, G. P. Biswas, (2020), Python Programming – Problem Solving, Packages And Libraries, McGraw Hill Publications.

Reference Books:

- SheetalTaneja and Naveen Kumar, (2018) "Python programming A Modular Approach with Database, Mobile, and Web Applications" Pearson India Education Services.
- Chris Meyers Allen Downey, Jeffrey Elkner. (2015). Learning with Python DreamTech Press, Kindle Edition.

Web References:

- https://www.youtube.com/watch?v=ApMSoHn1cM4
- https://www.youtube.com/watch?v=eaXiOpnRYDE

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT6E4			**Title**	**Batch:**	2023 - 2026
				DSE – II : Big Data Analytics	**Semester:**	VI
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

To cultivate knowledge about big data analytics and 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	Knowledge Level
CO1	To remember the fundamentals of Big Data.	K1
CO2	To understand the concepts of Hadoop	K2
CO3	To apply different types of Analytics	K3
CO4	To evaluate the results and transform the business	K4
CO5	To determine business through big data	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	L	L	L	H	M	M	-	M	-	M
CO2	-	M	L	M	-	M	M	L	L	L	-	M
CO3	M	M	M	M	-	H	-	M	-	-	-	L
CO4	M	M	H	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

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	**16**
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.**	**15**
Unit III	**Apply Analytics :** Evolution of analytics-Text analytics-Speech analytics-Video/image analytics-Behavior analytics-Combined analytics-Transparency-Prediction vs. privacy	**14**
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	**15**
Unit V	**Transform Business :** Better understand and target customers- Improve and optimize business processes- Improve people's health and well-being- Improve business security and reduce fraud- Drive business and people performance- Improve cities and other infrastructure- New business opportunities- Smart will transform employment	**15**
	Total Contact Hrs.	**75**

Assessment Methods:

Test, Quiz, Assignments

Assessment Methods:

Test, Seminar, Quiz, Assignments

Text Books:

- SeemaAcharya, SubashiniChellapan, (2019) "Big Data and Analytics" , 2nd Edition, Wiley Publications (Unit – I, II)
- Bernard Marr, (2015) " Big data : using smart big data, analytics and metrics to make better decisions and improve performance", Wiley Publications (Unit – III, IV,V)

Reference Books:

- M. VijayalakshmiRadhaShankarmani (2016) "Big Data Analytics",KindleEdition,Wiley Publications

Web References:

- 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
- https://www.bmc.com/blogs/hadoop-introduction/
- https://www.bmc.com/blogs/hadoop-architecture/

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT6E5			**Title**	**Batch:**	2023 - 2026
				DSE – II : Artificial Intelligence	**Semester:**	VI
Lecture Hrs./Week:	5	**Tutorial Hrs./Sem.:**	-		**Credits:**	4

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	Knowledge Level
CO1	To Understand the nature of AI problems and task domains of AI	K1
CO2	To Apply the appropriate search procedures to solve the problems by using best algorithms.	K3
CO3	To Analyze and select the suitable knowledge representation method.	K4
CO4	To Manipulate the acquired knowledge and infer new knowledge.	K4
CO5	To Demonstrate the development of AI systems by encoding the knowledge	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	M	M	M	H	M	H	M	H	L	L
CO2	H	M	M	H	M	H	M	H	M	H	M	M
CO3	H	H	H	M	M	M	H	H	M	H	M	H
CO4	H	H	H	M	H	M	H	H	M	H	H	H
CO5	H	H	H	H	H	H	H	H	M	H	H	H

Units	Content	Hrs.
Unit I	**Introduction to knowledge-based Intelligent Systems:** Intelligent machines – History of AI from Dark ages to knowledge-based systems. **Introduction to AI**: AI Problems – AI techniques – Criteria for success. Problems, Problem Spaces, Search: State space search – Production Systems – Problem Characteristics – Issues in design of Search.	16
Unit II	**Heuristic Search techniques:** Generate and Test – Hill Climbing – Best-Fist, Problem Reduction, Constraint Satisfaction, Means-end analysis.	14
Unit III	**Knowledge representation issues:** Representations and mappings – Approaches to Knowledge representations – Issues in Knowledge representations – Frame Problem. **Predicate Logic:** Representing simple facts in logic – Representing Instance and Isa relationships – Computable functions and predicates – Resolution – Natural deduction.	16
Unit IV	**Representing knowledge using rules:** Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge.	14
Unit V	**Rule-Based Expert Systems:** Introduction to knowledge – Rules as knowledge representation – Players – Structure – Characteristics – Forward chaining and Backward chaining – Media Advisor Demonstration – Advantages and Disadvantages.	15
	Total Contact Hrs.	75

Pedagogy:

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD/ Roll Play /APS)

Text Book

- Elaine Rich, Kevin Knight, (2009), *Artificial Intelligence*, 3rd edition, Tata McGraw Hill Publications. (Unit I, Unit II, Unit III & Unit IV)
- Michael Negnevitsky, (2020), *Artificial Intelligence*, 3rd edition, Pearson India Education services PVT. Ltd. (Unit I & Unit V)

Reference Books

- Stuart Russell, Peter Norvig, (2009), *Artificial Intelligence: A Modern Approach*, 3rd Edition, Pearson New International Edition.
- Er. Rajiv Chopra, (2005),*Artificial Intelligence: A Practical Approach*, 1st Edition, S. Chand Publications.

Web References

- https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_expert_systems.htm
- https://www.geektonight.com/artificial-intelligence-pdf

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT6E6			**Title**	**Batch:**	2023 - 2026
				DSE – II : E-Commerce	**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	Knowledge Level
CO1	To remember basic concepts of e-commerce	K1
CO2	To understand the role of E-marketing, E-security, E-payment systems in current scenario	K2
CO3	To apply mobile payments.	K3
CO4	To analyze various portalsassociated with e-commerce	K4
CO5	To justify legal and ethical issues in digital economy and phishing	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	-	-	-	-	-	-	-	L	-	-	-
CO2	H	M	H	M	-	M	-	M	M	M	-	H
CO3	H	M	H	M	M	H	M	M	M	M	-	H
CO4	M	H	M	-	-	H	-	-	L	-	-	H
CO5	H	-	M	M	H	M	-	M	-	M	-	H

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:

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD/ Roll Play /APS)

23UIT6E6

Text Book

- P. T. Joseph S. J., (2017), *E - Commerce: An Indian Perspective,* 5th Edition, PHI.

Reference Books

- Henry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, (2011), *E-commerce Fundamentals and Applications*, 1st Edition, Wiley India Pvt Ltd.
- Gary P Schneider, (2012), *E-Commerce Strategy, Technology And Implementation*, 9th Edition, Engage Learning Pub.

WebReferences:

- https://www.slideshare.net/sajidkhetani/digital-payments-india-perspective
- https://www.sampletemplates.com/marketing-templates/digital-marketing-presentation.html

Course Designed by	Verified by HOD	Checked by	Approved by
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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT6E7			Title	Batch:	2023 - 2026
				DSE - III: Social Media Analytics	Semester:	VI
Lecture Hrs./Week	6	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

To provide an overview of common text mining and social media data analytic activities.

Course Outcome

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

CO Number	CO Statement	Knowledge Level
CO1	To remember the various concepts of data analytics.	K1
CO2	To Understand the terminologies, metaphors and perspectives of social media analytics	K2
CO3	To apply state of the art web mining tools and libraries on realistic data sets as a basis for business decisions and applications	K3
CO4	To analyze the solutions to the emerging problems with social media such as behavior analytics and Recommendation systems	K4
CO5	To evaluate ontology-based solutions for opinion extraction, sentiment classification and data summarization problems.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	L	L	L	H	M	M	-	M	-	M
CO2	-	M	L	M	-	M	M	L	L	L	-	M
CO3	M	M	M	M	-	H	-	M	-	-	-	L
CO4	M	M	H	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

Units	Content	Hrs.
Unit I	**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
Unit II	**Social Media Analytics Types, Tools and Social Network Landscape:** Analytics in social media: Types of analytics. Dedicated Vs. Hybrid Tools – Dedicated tools – Hybrid tools – Data Integration Tools – Best Setup. Social Network Landscape: Concept and UX on social networks – Interactivity of social network –Content flow on social network – Interaction Pattern between users – Social-Media as a two-way channel.	17
Unit III	**Analytic Process and Metrics:** Analytics Process: Analysis – Insight – Investigation beyond social analytics – Shaping a method –analysis cycle – Community Activity – Resources – Attention span – Dynamic cycles – Short Periods –Long Periods – Analyst Mindset – Instinctive Analyst. Metrics: Introduction – Default and custom metrics – Metrics Categories – Graph Types – Metric Capabilities – Metrics and Strategy – Estimated Metrics – Metrics and Tactics.	18
Unit IV	**Semantic Web and Social Network Analysis:** Introduction to Semantic Web: Limitations of current Web, Development of Semantic Web, And Emergence of the Social Web. Social Network analysis: Development of Social Network Analysis -Key concepts and measures in network analysis. Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities - Web-based networks.	18
Unit V	**Semantic Web and Ontology:** Knowledge representation on the Semantic web: Ontology and their role in the Semantic Web: Ontology-based knowledge Representation – Ontology languages for the Semantic Web: Resource Description Framework - Web Ontology Language.	19
	Total Contact Hrs.	**90**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD)

Text Book

- Alex Goncalves,Social Media Analytics Strategy (2017). - Using Data to Optimize Business Performance, Alex Goncalves, APress
- Peter Mika. (2007). Social Networks and the Semantic Web, First Edition, Springer.

Reference Books

- Ganis, Kohirkar (2016). Social media Analytics, IBM Press PTG, 1st Edition.
- Nancy Flynn (2012). The Social Media Hand book Policies, and Best Practices, Wiley.
- GuandongXu ,Yanchun Zhang and Lin Li, (2011). Web Mining and Social Networking – Techniques and applications, First Edition Springer.

Web Reference

- https://www.qualtrics.com/experience-management/research/social-media-analytics/
- https://www.ibm.com/topics/social-media-analytics
- https://cambridgesemantics.com/blog/semantic-university/intro-semantic-web/

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT6E8			**Title**	**Batch:**	2023 - 2026
				DSE - III: Internet of Things	**Semester:**	VI
Lecture Hrs./Week	6	**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	Knowledge Level
CO1	To remember the various concepts of IoT.	K1
CO2	To Understand the basic concepts of M2M and sensors	K2
CO3	To apply the concepts into the embedded devices	K3
CO4	To analyze the various privacy issues.	K4
CO5	To evaluate software design for IoT applications	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	L	L	L	H	M	M	-	M	-	M
CO2	-	M	L	M	-	M	M	L	L	L	-	M
CO3	M	M	M	M	-	H	-	M	-	-	-	L
CO4	M	M	H	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

Units	Content	Hrs.
Unit I	**IoT:** Overview – Introduction – Conceptual Framework – Architectural View – Technology Behind – Sources – M2M Communication – Examples.	17
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.	17
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.	18
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.	18
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.	20
	Total Contact Hrs.	**90**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Quiz, Assignments, Group Task.(GD)

Text Book

- Raj Kamal, (2019), *Internet of Things Architecture and Design Principle*, 4th Reprint, McGraw Hill Education.

Reference Books

- Vijay Madisetti and ArshdeepBahga, (2014), *Internet of Things (A Hands-on-Approach),* 1st Edition, VPT
- Margolis, Michael (2011) Arduino Cookbook: Receipestobegin, *Expand and Enhance Your Projects*. O'Reilly Media Inc.
- Monk, Simon. Raspberry Pi (2016) *Cookbook: Software and hardware problems and Solutions.*O'Reilly Media Inc.

Web Reference

- https://onlinecourses.swayam2.ac.in/aic20_sp06/preview
- https://onlinecourses.swayam2.ac.in/arp19_ap79/preview

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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT6E9			Title	Batch:	2023 - 2026
				DSE - III Block Chain Technology	Semester:	VI
Lecture Hrs/Week:	6	Tutorial Hrs./ Sem.	-		Credits:	4

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	Knowledge Level
CO1	To keep in mind the fundamentals of block chain technology and crypto currency	K1
CO2	To understand the mining mechanism in block chain.	K2
CO3	To apply and identify security measures, and various types of services that allow people to trade and transact with bit coin.	K3
CO4	To analyze security, privacy, and efficiency of a given Blockchain system.	K4
CO5	To explain the Blockchain technology in various fields.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	H	H	H	-	H	M	-	H	H	H	H
CO2	M	-	H	M	M	-	M	M	H	-	M	-
CO3	M	H	-	H	H	M	-	H	-	H	H	H
CO4	H	-	H	H	H	-	H	-	M	M	H	-
CO5	H	H	-	H	-	H	M	H	-	H	-	H

Units	Content	Hrs.
Unit I	**Introduction to Blockchain**: The big picture of the industry – size, growth, structure, players. Bitcoin versus Cryptocurrencies versus Blockchain - Distributed Ledger Technology (DLT). Strategic analysis of the space – Blockchain platforms, regulators, application providers. The major application: currency, identity, chain of custody.	**18**
Unit II	**Network and Security:** Advantage over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Blockchain 1.0, 2.0 and 3.0 – transition, advancements and features. Privacy, Security issues in Blockchain.	**19**
Unit III	**Cryptocurrency:** Cryptocurrency - History, Distributed Ledger, Bitcoin 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 Blockchain.	**19**
Unit IV	**Cryptocurrency Regulation:** Cryptocurrency Regulation - Stakeholders, Roots of Bit coin, Legal views - exchange of cryptocurrency - 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 - Blockchain properties - Healthcare Costs - Healthcare Quality - Healthcare Value - Challenges for using blockchain for healthcare data.	**16**
	Total Contact Hrs.	90

Pedagogy :

Digital Presentation, Chalk and talk, Flipped class.

Assessment Methods:

Seminar, Assignment, Group task.

Text Books:

- Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, (2016), "*Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction*", Princeton University Press.
- Antonopoulos, "*Mastering Bitcoin: Unlocking Digital Cryptocurrencies*"

ReferenceBooks:

- Satoshi Nakamoto, "*Bitcoin: A Peer-to-Peer Electronic Cash System*".
- Rodrigo da Rosa Righi, Antonio Marcos Alberti, Madhusudan Singh, (2020), "*Blockchain Technology for Industry 4.0*", Springer.

Web Reference:

- https://www.slideshare.net/Mithileysh/blockchain-technology-181440314
- https://www.slideshare.net/asrithak/blockchain-technology-ppt

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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT620			Title	Batch:	2023 - 2026
				Core Lab. - VIII: Python Programming	Semester:	VI
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.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To deploy the list and tuple using control structures	K3
CO2	To examine need of files and its related functions	K4
CO3	To choose various packages suitable for the application	K5
CO4	To verify the usage of various in built functions and packages	K5
CO5	To create an application using python as a developing tool	K6

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	L	L	L	M	M	L	M	L	L	L
CO2	L	M	L	L	L	M	M	L	M	M	L	L
CO3	L	M	L	L	L	M	H	H	H	L	L	L
CO4	M	M	L	M	L	M	H	H	M	L	L	L
CO5	L	M	L	L	L	M	H	H	H	M	L	L

Content	Hrs.
SAMPLE PROGRAM LIST 1. Develop a program to read a number n and print an inverted star pattern of the desired size. 2. Develop a program to search the number of times a particular number occurs in a list. 3. Develop a program to read a list of words and return the length of the longest one 4. Develop a program to take a string and replace every blank space with a hyphen 5, Develop a program to check if a given key exists in a dictionary or not 6. Create a program to check common letters in the two input strings 7. Apply recursion to reverse a string 8. Develop a program to read the contents of a file. 9. Assess the area of a rectangle using classes. 10. Test for reading a string from the user and appends it into a file.	**75**
Total Contact Hrs.	**75**

Pedagogy:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Task(GD)

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT621			**Title**	**Batch:**	2023 - 2026
				Core Lab. – IX: Linux	**Semester:**	VI
Practical Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	2

Course Objective

To obtain the practical knowledge about Unix& Linux Operating System 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	Knowledge Level
CO1	To apply the concepts of GNOME, shell and SDK.	K3
CO2	To analyze the various commands.	K4
CO3	To verify the results for the different input data.	K5
CO4	To create applications in Linux.	K6
CO5	To create various simple Android applications.	K6

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	M	M	-	H	-	M	-	-	-	L
CO2	M	M	H	L	L	M	L	H	-	-	-	L
CO3	-	M	L	H	L	M	-	-	-	M	-	-
CO4	M	M	H	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

Content	Hrs.
Sample Program List **Test I** Using GNOME, perform the following 1. Develop the Change of the Desktop Background and mouse pointer theme. 2. Develop the Change the Root Password. 3. Create the Add/Remove software. 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 **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:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Task.(GD)

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT6S1			**Title**	**Batch:**	2023 - 2026
				SEC – IV : Naan Mudhalvan : Multimedia Lab. (Flash)	**Semester:**	VI
Practical Hrs./Week	2	**Tutorial Hrs./Sem.**	--		**Credits:**	2

Course Objective

To know various animation techniques like as game creation, flying of butterfly, moving solar system etc.,

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To apply the ability to write script in flash to create 2Danimations	K3
CO2	To motivate to create animated banners	K4
CO3	To create own 2D animation film	K5
CO4	To develop digital multimedia content	K6
CO5	To design animated pictures	K6

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	H	M	M	H	M	M	M	H	-	H
CO2	M	H	M	-	-	H	-	-	-	H	-	H
CO3	H	-	M	M	H	M	-	M	-	H	-	H
CO4	M	H	M	-	-	H	-		-	H	-	H
CO5	M	H	H	-	H	M	-	M	-	H	-	H

Units	Content	Hrs
Unit I	❖ Develop a flash program to animate the Butterfly ❖ Develop a flash program to animate the Solar system ❖ Develop a flash program to animate the flag hoisting ❖ Develop a flash program to animate any game play ❖ Develop a flash program to animate traffic control	30
Unit II	❖ Create fish aquarium ❖ Create walking with naturals ❖ Create animation using any vehicle ❖ Create a raining program effect using flash ❖ Develop animate musical instrument play	
Unit III	❖ Create the flight land and takeoff animation ❖ Create any animate cartoon character ❖ Developanimation for reading a book (flip) ❖ Create animation for the wall clock/ digital clock ❖ Create banner using 2D animation	
	Total Contact Hrs.	**30**

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group discussion

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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT6S2			Title SEC – IV : Naan Mudhalvan : Multimedia Lab. (3Ds Max)	Batch:	2023 - 2026
					Semester:	VI
Practical Hrs./Week	2	Tutorial Hrs./Sem.	--		Credits:	2

Course Objective

To know various animation techniques like as game creation, flying of butterfly, moving solar system etc.,

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To apply the ability to write script in flash to create 2Danimations	K3
CO2	To motivate to create animated banners	K4
CO3	To create own 2D animation film	K5
CO4	To develop digital multimedia content	K6
CO5	To design animated pictures	K6

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	H	M	M	H	M	M	M	H	-	H
CO2	M	H	M	-	-	H	-	-	-	H	-	H
CO3	H	-	M	M	H	M	-	M	-	H	-	H
CO4	M	H	M	-	-	H	-		-	H	-	H
CO5	M	H	H	-	H	M		M	-	H	-	H

Units	Content	Hrs.
Unit I	❖ Develop a program to animate the Butterfly ❖ Develop a program to animate the Solar system ❖ Develop a program to animate the flag hoisting ❖ Develop a program to animate any game play ❖ Develop a program to animate traffic control	30
Unit II	❖ Create fish aquarium ❖ Create walking with naturals ❖ Create animation using any vehicle ❖ Create a raining program effect using 3Ds Max ❖ Develop animate musical instrument play using 3Ds Max	
Unit III	❖ Create the flight land and takeoff animation ❖ Create any animate cartoon character using 3Ds Max ❖ Developanimation for reading a book (flip) ❖ Create animation for the wall clock/ digital clock using 3Ds Max ❖ Create banner using 2D animation	
	Total Contact Hrs.	**30**

Pedagogy:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group discussion

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Dr. R.MANICKA CHEZIAN, M.Sc.,M.S.,Ph.D.,
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Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT622			Title	Batch:	2023 - 2026
				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	Knowledge Level
CO1	To create database, tables, coding	K6
CO2	To apply the coding into System side	K3
CO3	To apply various tools in real time Applications/Software	K3
CO4	To analyze the system requirements of the Application /Software	K4
CO5	To verify the developed Application with the customer requirements	K5
CO6	Evaluate the Applications/Softwares through the stake holder	K6

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	H	H	H	M	H	M	H	M	M	M
CO2	H	M	H	H	H	M	H	M	M	H	M	M
CO3	H	H	M	M	H	M	H	M	M	H	M	M
CO4	H	H	H	H	H	H	H	H	H	H	H	M
CO5	H	H	H	M	H	M	H	H	H	H	H	H
CO6	H	H	H	H	H	H	H	M	H	H	H	H

Content
Using only the following Elective Tools **Front end, Multimedia & Web based tools:** 1 Java & Advanced Java 2. Angular & Javascript 3. PHP 4. Python 5. C#.NET & VB.NET 6. HTML 5.0 7. Flash, 3D Max 8. R - Programming **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) going to fourth semester Vacation and submit their report on fifth semester

Pedagogy:

Direct Instruction, Digital Presentation

Assessment Methods:

Assignments, Reviews, Group Task (GD/APS)

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: K.Vijayakumar Signature:	Name: K.Vijayakumar Signature:	Name: Mr. K.Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

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Programme Code:	B.Sc. - IT			**Programme Title:**	Information Technology	
Course Code:	23UIT6AL			**Title**	**Batch:**	2023 - 2026
				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	Knowledge Level
CO1	To remember the fundamentals of digital forensics.	K1
CO2	To understand aboutdigital evidence	K2
CO3	To apply different types of system artifacts and anti-forensic concepts	K3
CO4	To evaluate the privacy search	K4
CO5	To determine mobile device forensics	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	L	L	L	H	M	M	-	M	-	M
CO2	-	M	L	M	-	M	M	L	L	L	-	M
CO3	M	M	M	M	-	H	-	M	-	-	-	L
CO4	M	M	H	L	L	M	L	H	-	-	-	L
CO5	-	M	L	H	L	M	-	-	-	M	-	-

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 - Cloud Forensics - Solid State Drives.

Assessment Methods:

Test, Quiz, Assignments

Text Books:

- John Sammons, (2012) "The Basics of Digital Forensics, The Primer for Getting Started in DigitalForensics", Syngress.
- Tony Sammes, Brian Jenkinson, (2007) "Forensic Computing", Second edition, Springer.

Reference Books:

- Cory Altheide and Harlan Carvey, (2011) "Digital Forensics with Open Source Tools", Elsevier.
- BillNelson, Amelia Philips, Chris Steuart (2015) "GuidetoComputer ForensicsandInvestigations", 5th Edition, CENGAGE Learning.

Web References:

- 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	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: B. Kalaiselvi Signature:	Name: K. Vijayakumar Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

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