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.

Programme Educational Objectives:

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

Programme Outcomes:

PO1	***Problem solving***: Ability to apply the knowledge of mathematical fundamentals and programming ability to solve complex problems in the field of Information Technology.
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 Entrepreneur by acquiring skills related to their domain and to address the industry and social needs with Environmental considerations.
PO4	***Research-related skills:*** Ability to cultivate research-based knowledge for innovating new ideas and 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	***Lifelong 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.

Programme 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

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

	PEO1	**PEO2**	**PEO3**	**PEO4**	**PEO5**
PO1: ***Problem solving***:	M	L	M	H	M
PO2: ***Disciplinary knowledge***	H	M	M	H	M
PO3: ***Entrepreneurship skills***	L	L	H	M	H
PO4: ***Research-related skills***	L	H	M	M	M
PO5: ***Moral and ethical awareness/reasoning***	L	M	H	L	H
PO6: ***Lifelong learning***	M	H	L	L	L
PO7: ***Critical thinking***	H	M	H	H	M
PO8: ***Information/digital literacy***	H	L	H	H	L
PO9: ***Data analytic skills:***	L	L	H	H	L
PO10: ***Contemporary Skills***	H	L	M	H	M

NGM College - Department of Information Technology
Scheme of Examination For 2022 - 2023
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	22UTL101 / 22UHN101 / 22UFR101	Tamil Paper - I /	6	-	-	3	50	50	100	3
		Hindi Paper - I /		-	-					
		French Paper – I		-	-					
II	22UEN101	English Paper - I (Level I)	5	-	-	3	50	50	100	3
	22UEN102	English Paper - I (Level II)		-	-					
III	22UIT101	Core-I : Programming in 'C'	4	-	4	3	50	50	100	4
	22UIT102	Core - II : Computer System Architecture	5	-		3	50	50	100	4
	22UIT1A1	Allied - I : Mathematics - I (Statistics)	4	-	-	-	50	50	100	4
	22UIT103	Core Lab - I : Programming in 'C'	-	4	-	5	25	25	50	2
IV	22UHR101	Human Rights	1	-	-	2	-	50	50	2
	22HEC101	Human Excellence - Personal Values & SKY Yoga Practice - I	1	-	-	2	25	25	50	1
V		Extension Activities – Annexure I	-	-	-	-	-	-	-	-
CC		Online Course (Optional) (MOOC / NPTEL / SWAYAM)								Grade

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	22UTL202 / 22UHN202/ 22UFR202	Tamil Paper - II /	6	-	-	3	50	50	100	3
		Hindi Paper - II /		-	-					
		French Paper – II		-	-					
II	22UEN202	English Paper - II (Level I)	5	-	-	3	50	50	100	3
	22UEN203	English Paper - II (Level II)		-	-					
III	22UIT204	Core - III : Object Oriented Programming with Java	4	-	-	3	50	50	100	4
	22UIT205	Core - IV : Data Structures	4	-	-	3	50	50	100	4
	22UIT2A2	Allied - II : Mathematics II (Discrete Mathematics)	4	-	10	3	50	50	100	4
	22UIT206	Core Lab - II : Programming in Java	-	4	-	3	25	25	50	2
IV	22EVS201	Environmental Studies	2	-	-	2	-	50	50	2
	22HEC202	Human Excellence - Family Values & SKY Yoga Practice – II	1	-	-	2	25	25	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
CC	22CMM201	Manaiyiyal Mahathuvam - I	1	-	-	2	-	50	50	Grade
	22CUB201	Uzhavu Bharatham - I	1	-	-	2	-	50	50	Grade
		Online Course (Optional) (MOOC / NPTEL / SWAYAM)								Grade

Ratified Syllabi and Scheme of Examinations for B.Sc. Information Technology Programme (Self Financing) III to VI Semesters 2022-2023 Batch

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	22UTL302 / 22UHN302/ 22UFR302	Tamil Paper - II /	3	-	-	3	50	50	100	3
		Hindi Paper - II /		-	-					
		French Paper – II		-	-					
II	22UEN304	English Paper - II (Level I)	3	-	-	3	50	50	100	3
	22UEN305	English Paper - II (Level II)		-	-					
III	22UIT307	Core - V : Operating Systems	5	-	-	3	50	50	100	4
	22UIT308	Core - VI : Relational Database Management System	4	-	-	3	50	50	100	4
	22UIT3A3	Allied - III : Microprocessor and Assembly Language Programming	5	-	-	3	50	50	100	4
	22UIT309	Core Lab - III : RDBMS	-	4	-	3	25	25	50	2
	22UIT310	Core Lab - IV: Web Designing (HTML& DHTML)	-	4	-	3	25	25	50	2
IV	22UIT3N1/ 22UIT3N2	Non Major Elective - I : Social Networks / Non Major Elective - I : Hardware & Networking	1	-	-	2	-	50	50	2
	22HEC303	Human Excellence - Professional Values & Ethics – III	1	-	-	2	25	25	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
CC	22CMM302	Manaiyiyal Mahathuvam - II	1	-	-	2	-	50	50	Grade
	22CUB302	Uzhavu Bharatham - II	1	-	-	2	-	50	50	Grade

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	22UTL402 / 22UHN402/ 22UFR402	Tamil Paper - II /	3	-	-	3	50	50	100	3
		Hindi Paper - II /		-	-					
		French Paper – II		-	-					
II	22UEN404	English Paper - II (Level I)	3	-	-	3	50	50	100	3
	22UEN405	English Paper - II (Level II)		-	-					
III	22UIT411	Core - VIII : Data Communication and Networks	4	-	-	3	50	50	100	4
	22UIT412	Core - IX : Advanced Java Programming	4	-	5	3	50	50	100	4
	22UIT4A4	Allied - IV : Software Engineering	4	-	-	3	50	50	100	4
	22UIT413	Core Lab - V : Programming in Advanced Java	-	6	-	3	25	25	50	3
IV	22UIT4S1	Skill Based Lab. I - Naan Mudhalvan - Advanced Excel	-	4	-	2	-	50	50	2
	22UIT4N1 / 22UIT4N2	Non Major Elective - II : Data Analytics / Non Major Elective - II : Computer Security	1	-	-	2	-	50	50	2
	22HEC404	Human Excellence - Social Values & SKY Yoga Practice – IV	1	-	-	2	25	25	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	50	1
CC	22CMM403	Manaiyiyal Mahathuvam - III	1	-	-	2	-	50	50	Grade
	22CUB403	Uzhavu Bharatham - III	1	-	-	2	-	50	50	Grade

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	22UIT514	Core -XI : Information Security	6	-	-	3	50	50	100	4
	22UIT515	Core - XII : Python Programming	5	-	5	3	50	50	100	4
	22UIT5E1/ 22UIT5E2/ 22UIT5E3	Core Elective - I : Data Mining and Analytics/ Core Elective - I : Artificial Intelligence/ Core Elective - I : E-Commerce	6	-	-	3	50	50	100	4
	22UIT516	Core Lab - VII : Python Programming	-	5	-	3	50	50	100	3
	22UIT517	Core Lab - VIII : Visual Programming	-	4	-	3	25	25	50	2
	22UIT5AL	Advanced Learner Course - I R- Programming (Optional)	SS		-	3	50	50	100	5*
IV	22UIT5S1/ 22UIT5S2	Skill Based Lab. - II : Web Development (PHP) / (ASP.net)	-	3	-	2	-	50	50	2
	22HEC505	Human Excellence - National Values & SKY Yoga Practice - V	1	-	-	2	25	25	50	1
CC	22CSD501	Soft Skills Development - I	-	-	-	-	-	-	-	Grade
	22GKL501	General Awareness - Self Study	SS	-	-	2	-	-	-	Grade
	22VIT501	Social Networks								Grade

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	22UIT618	Core - XIV : Open Source Methodologies	5	-	-	3	50	50	100	4
	22UIT6E1/ 22UIT6E2/ 22UIT6E3	Core Elective - II : Big Data Analytics / Core Elective - II : Machine Learning/ Core Elective - II : Block Chain Technology	6	-	-	3	50	50	100	4
	22UIT6E4/ 22UIT6E5/ 22UIT6E6	Core Elective - III : Cloud Computing / Core Elective - III : Internet of Things / Core Elective - III : Mobile Computing	6	-	-	3	50	50	100	4
	22UIT619	Core Lab - IX : Open Source Methodologies (Linux)	-	5	-	3	25	25	50	3
	22UIT620	Core Lab. – X : Software Testing Tools	-	4	-	3	25	25	50	2
	22UIT621	Project	-	-	-	-	50	50	100	2
	22UIT6AL	Advanced Learner Course - II R -Programming Lab**.** (Optional)	SS	-	-	3	50	50	100	5*
IV	22UIT6S1/ 22UIT6S2	Skill Based Elective – II : - Naan Mudhalvan : DTP Software Lab. (Photoshop / CorelDraw)	-	3	-	2	-	50	50	2
	22HEC606	Human Excellence - Global Values & SKY Yoga Practice - VI	1	-	-	2	25	25	50	1
CC	22CSD602	Soft Skills Development - II	-	-	-	-	-	-	-	Grade
	22VIT602	Crux of Cyber Security and Crime								Grade
Total									**3900**	**140+10***

AL - Advanced Learner Course (Optional) *Extra Credit Courses **CC** -Certificate Courses

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: 50 Marks (Part I, II, & III)

(i) Test- I & II, ESE:

Knowledge Level	Section	Marks	Description	Total
K1 & K2 (Q 1 -10)	A (Q 1 – 5 MCQ) (Q 6–10 Define/Short Answer)	10 x 1 = 10	MCQ & Define	50
K3 (Q 11-15)	B (Either or pattern)	5 x 3 = 15	Short Answers	
K4 & K5 (Q 16 – 21)	C (Either or pattern)	5 x 5 = 25	Descriptive/ Detailed	

2. Theory Examinations: 50 Marks (Part IV)

Knowledge Level	Section	Marks	Description	Total
K1 & K2 (Q 1 -10)	A (Q 1 – 5 MCQ) (Q 6–10 Define / Short Answer)	10 x 1 = 10	MCQ & Define	50
K3, K4 & K5 (Q 11-18)	B (Answer 5 out of 8)	5 x 8 = 40	Short Answers	

3. Practical Examinations: 100/50 Marks

Knowledge Level	Criterion	External/Internal Marks	Total
K3	Record work & Practical	50/50	100
K4			
K5		25/25	50
K6			

Components of Continuous Internal Assessment

(THEORY)

Maximum Marks: 100; CIA Mark: 50

Components		Calculation	CIA Total
Test 1	50/3.33=15	15+15+05+10+05	50
Test 2 / Model	50/3.33=15		
Seminar / Socratic Seminar	05		
Assignment / Digital Assignment	10		
Group Task : GD, Role Play, APS	05		

Maximum Marks: 50; CIA Mark: 25

Components		Calculation	CIA Total
Test 1 / Model	10	10+5+5+5	25
Seminar / Socratic Seminar	05		
Assignment / Digital Assignment	05		
Group Task : GD, Role Play, APS	05		

PRACTICAL

Maximum Marks: 50; CIA Mark: 25

Components		Calculation	CIA Total
Test / Model	**15/30**	**15+5+5**	**25**
Observation	**5/5**		
Record	**5/15**		

Maximum Marks: 100; CIA Mark: 50

Components		Calculation	CIA Total
Test / Model	30	30+10+10	50
Observation	10		
Record	10		

Continuous Internal Assessment for Project

Maximum Marks: 100; CIA Mark: 50

Components		Calculation	CIA Total
Review I	10	10+10+10+20	50
Review II	10		
Review III	10		
Report Submission	20		

For Computer Science Cluster

Maximum Marks: 50 Marks

Criterion	Mode of Evaluation	Marks	Total
I	Synopsis, Company Profile, System Specification, Existing System, Proposed System	10	50
II	Supporting Diagrams like System Flowchart, ER, DFD, Usecase and Table Design	10	
III	Coding, Input Forms, Output format, Testing	20	
IV	Preparation of Report & Submission	10	

External Assessment: 50 Marks

Mode of Evaluation	Marks	Total	Grand Total
Project Report			
Title Relevance of the Industry / Institute	05	30	50
Technology	05		
Design and Development Publishing	10		
Testing, Report	10		
Viva Voce			
Project Presentation	10	20	
Q & A Performance	10		

STUDENT SEMINAR EVALUATION RUBRIC

Grading Scale:

A	B	C	D
5	4	2 - 3	0 - 1

CRITERIA	A - Excellent	B - Good	C - Average	D - Inadequate
Organization of presentation	Information presented as interesting story in logical, easy to follow sequence	Information presented in logical sequence; easy to follow	Most of information presented in sequence	Hard to follow; sequence of information jumpy
Knowledge of 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 grasp of information; answered only rudimentary Questions **&** Material not clearly related to topic **OR** background dominated seminar
Presentation Skills using ICT Tools	Uses graphics that explain and reinforce text and presentation	Uses graphics that explain 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 audience	Refers to slides to make points; eye contact majority of 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 Voice is clear and steady; audience can hear well at all times	Incorrectly pronounces few terms Voice is clear with few fluctuations; 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 GRADING RUBRIC

Grading Scale:

A	B	C	D	E
09 - 10	**07 - 08**	**05 - 06**	**03 - 04**	**01 - 02**

CRITERION	A - Excellent	B – Good	C - Average	D - Below Average	E - Inadequate
Content & Focus	Hits on almost all content exceptionally clear	Hits on most key points and writing is interesting	Hits in basic content and writing is 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 topic ∗ Words convey intended message	∗ Word choice is basic ∗ Most writing language is appropriate to topic ∗ Informal language	∗ Word choice is vague ∗ Writing language is not appropriate to 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:	22UIT101			**Title**	**Batch:**	2022 - 2025
				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 978-81-317-2422-4.

Reference Books

- Balagurusamy. E. (2008). *Programming in ANSI C*. Tata McGraw-Hill.
- Pradip Dey, Manas Ghosh. (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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT102			**Title**	**Batch:**	2022 - 2025
				Computer System Architecture	**Semester:**	I
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

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

Course Outcomes

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

CO Number	**CO Statement**	**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.	**15**
Unit II	**Basic Computer Organization and Design:** Instruction Codes - Computer Registers – Computer Instructions – Instruction Cycle – Memory Reference Instructions – InputOutput and Interrupt.	**15**
Unit III	**Central Processing Unit (CPU):** General Register Organization – Stack Organization - Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control.	**14**
Unit IV	**Input – Output Organization:** Peripheral Devices- Input – Output Interface – Asynchronous Data Transfer - Direct Memory Access (DMA) - CPU-IOP Communication.	**15**
Unit V	**Memory Organization:** Memory Hierarchy – Main Memory - Auxiliary Memory - Cache Memory – Associative Memory - Virtual Memory.	**16**
	Total Contact Hrs.	**75**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

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

Text Book

- M. Morris Mano. (2022), 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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head,Dept. of Information Technology,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT1A1			**Title:**	**Batch :**	2022 - 2025
				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
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, NGM College (Autonomous), POLLACHI - 642 001.

K. SRINIVASAN, M.C.A., Co-ordinator, Curriculum Development Cell (CDC), NGM College (Autonomous), Pollachi - 642 001.

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:	22UIT103			**Title**	**Batch:**	2022 - 2025
				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
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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT204			**Title**	**Batch:**	2022 - 2025
				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
Name: C.R. Durga devi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT205		**Title**	**Batch:**	2022 - 2025
			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, Yedidyeh Langsam, Moshe .J. Augenstein. (2007). *Data Structure using C*. 3rd Edition.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
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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT2A2			**Title**	**Batch:**	2022 - 2025
				Mathematics II (Discrete Structures)	**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
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:

K. VIJAYAKUMAR, MCA., M.Phil.,
Head, Dept. of Information Technology,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT206			**Title**	**Batch:**	2022 - 2025
				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	CO Statement	Knowledge
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)

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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head,Dept. of Information Technology,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT307			**Title:**	**Batch :**	2022 - 2025
				Core 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/ch22.pdf

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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT308			**Title**	**Batch:**	2022 - 2025
				Core 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.	13
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.	11
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.
- Arun Majumdar & 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 Reference

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

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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head, Dept. of Information Technology
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT3A3			**Title**	**Batch:**	2022 – 2025
				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

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
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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head, Dept. of Information Technology
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT309			**Title**	**Batch:**	2022 - 2025
				Core 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
Name: C.R. Durga devi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT310			**Title**	**Batch:**	2022 - 2025
				Core Lab. IV – Web Designing (HTML & DHTML)	**Semester:**	III
Practical Hrs./Week	4	**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	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 (HTML)** 1. Experiment with Webpage creation using HTML. 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 color 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	**60**

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
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:

K.VIJAYAKUMAR, MCA.,M.Phil., Head,Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.

K. SRINIVASAN, M.C.A., Co-ordinator Curriculum Development Cell (CDC) NGM College (Autonomous) Pollachi - 642 001.

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:	22UIT3N1			Title	Batch:	2022 - 2025
				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.(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

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:

K.VIJAYAKUMAR, MCA.,M.Phil., Head,Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.

K. SRINIVASAN, M.C.A., Co-ordinator Curriculum Development Cell (CDC) NGM College (Autonomous) Pollachi - 642 001.

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:	22UIT3N2			**Title**	**Batch:**	2022 - 2025
				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	PO1	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

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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head, Dept. of Information Technology
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT411			**Title**	**Batch:**	2022 - 2025
				Core VIII : Data Communication and Networks	**Semester:**	IV
Lecture Hrs./Week	4	**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)	K5

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.	11
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.	12
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).	12
Unit IV	**X.25 Protocol**: 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.	13
Unit V	Internetworking Concepts, Devices, Internet Basics, History and Architecture. **Ways of Accessing the Internet:** Introduction- Dial- up access- Leased lines- DSL- Cable modems.	12
	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

- 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

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: V.Prabavathi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT412			**Title**	**Batch:**	2022 - 2025
					Semester:	IV
Lecture Hrs./Week	4	**Tutorial Hrs./Sem.**	**5**	Core IX : Advanced Java Programming	**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.	12+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.	12+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.	12+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 counter example.**JSP:** Introduction – Scripting elements - life cycle.	11+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).	13+1
	Total Contact Hrs.	**60**

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

- Rashim Mogha, 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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head, Dept. of Information Technology
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT4A4			**Title**	**Batch:**	2022 - 2025
				Allied IV : Software Engineering	**Semester:**	IV
Lecture Hrs./Week	4	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

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

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.	12
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.	12
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.	11
Unit IV	**Quality Concepts:** Software Quality-Dilemma-Achieving Software Quality. **Software Quality Assurance:** Elements – Tasks, Goals and metrics – Statistical SQA – Software reliability – SQA plan**.**	11
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.	14
	Total Contact Hrs.	**60**

Pedagogy:

Digital Presentation, Chalk and talk, Flipped class

Assessment Methods:

Seminar, Quiz, Assignment, Group task.

Text Book

- 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.
- Pankaj Jalote , (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
Name: R. Sekar 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
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT413			**Title**	**Batch:**	2022 - 2025
				Lab. - V Programming in Advanced Java	**Semester:**	IV
Practical Hrs./Week	6	**Tutorial Hrs./Sem.**	-		**Credits:**	3

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	PO 9	PO10	PSO 1	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. Devwlop JTabbedPane 5. Create Function of JTree 6. Create JScrollPane using swing **Test II** 7. Develop a Generic Servlet. 8. Implement JDBC using Servlet. 9. Develope a Javabean to create Juggler Bean. 10. Generate simple property Javabean	**90**

Pedagogy :

Direct Insteuxtion, Digital Presentation

Assessment Methods:

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

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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head, Dept. of Information Technology
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT4S1			**Title**	**Batch:**	2022 - 2025
				Skill Based Lab. Naan Mudhalvan - Advanced Excel	**Semester:**	IV
Practical Hrs./Week	4	**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 apply statistical 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 Statistics Functions 2. Using date functions 3. Logical Function- IF function 4. Look up Functions 5. Financial Functions **Test II** 1. Large Datasets Freezing and Printing 2. Conditional Formatting 3. Pivot Table creation with chart 4. Advanced Filtering 5. Database functions	**60**

Pedagogy:

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
Name: C.R. Durga devi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT4N1			**Title**	**Batch:**	2022 - 2025
				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
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:

K. VIJAYAKUMAR, MCA., M.Phil.,
Head, Dept. of Information Technology,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT4N2			Title	Batch:	2022 - 2025
				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	M	M	M	-	-	H
CO3	-	M	H	H	-	-	M	H	M	M	-	H
CO4	-	M	H	-	-	H	H	H	H	M	-	H
CO5	M	-	-	H	-	-	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

- Atul Kahate. (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/

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: V.Prabavathi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT514			**Title**	**Batch:**	2022 - 2025
				Core – XI : Information Security	**Semester:**	V
Lecture Hrs./Week	6	**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.	18
Unit II	**Symmetric Key Algorithms**: Introduction - **Algorithm Types and modes* – Overview – DES– IDEA– RC4 & 5 – Blowfish – AES.	19
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.	18
Unit IV	**Digital Certificates:** Introduction – Concepts – **Certification Authority* – Technical details – Creation – Cross certification – Revocations. **Private key management - PKIX model** – **PKCS**.	18
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.	17
	Total Contact Hrs.	**90**

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

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:

K. VIJAYAKUMAR, MCA., M.Phil.,
Head, Dept. of Information Technology,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT515			Title	Batch:	2022 - 2025
				Core – XII : Python Programming	Semester:	VI
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	5		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	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.	15+1
Unit II	**Operators in python**- **Functions:** Introduction-Need-Basics-Defining functions- Passing Variables- Function Arguments-Additional note on Modules-Special functions.	13+1
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.	12+1
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.	17+1
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.	18+1
	Total Contact Hrs.	**75**

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, Mc Graw Hill Publications.

Reference Books:

- Sheetal Taneja 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

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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head,Dept. of Information Technology,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT5E1			Title	Batch:	2022 - 2025
				Core Elective-I: Data Mining and Analytics	Semester:	V
Lecture Hrs./Week	6	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

To give a better understanding of various concepts of Data mining includes KDD, Association rules, Classification, Clustering, and also about big 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 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 big data.	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 mining -Kinds of data-functionalities- classification-Task primitives-Integration with database or warehouse-Major issues. **Mining frequent patterns, association and correlations**: Basic concepts. **Efficient and scalable frequent itemset mining methods:** Apriori Algorithm-Generating association rules.	20
Unit II	**Classification and prediction:** Definition – Issues - classification by Decision tree Induction – Bayesian classification-rule based classification - classification by back propagation - support vector machine.	18
Unit III	**Cluster analysis:** Definition - types of data in cluster analysis - categorization of major clustering methods - partitioning methods - hierarchical methods	17
Unit IV	Spatial data mining - multimedia data mining - text mining - mining the www - data mining Applications.	18
Unit V	**Big data Analytics** : Introduction - Drivers for big data-Applications-Architecture-Advanced Analytics platform-Implementation	17
	Total Contact Hrs.	**90**

Pedagogy:

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

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

Text Book

- Jiawei Han and Micheline Kamber (2005) Data Mining concepts and techniques, Elsevier publication (Units – I, II, III & IV).
- Dr. Aravind Sathi (2012) Big Data Analytics:Disruptive Technologies for Changing the Game, 1st Edition, MC Press publication (Unit – V).

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

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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head,Dept. of Information Technology,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT5E2			**Title**	**Batch:**	2022 - 2025
				Core Elective – I : Artificial Intelligence	**Semester:**	V
Lecture Hrs./Week:	6	**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 and expert 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.	19
Unit II	**Heuristic Search techniques:** Generate and Test – Hill Climbing – Best-Fist, Problem Reduction, Constraint Satisfaction, Means-end analysis.	16
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.	19
Unit IV	**Representing knowledge using rules:** Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge.	18
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.	18
	Total Contact Hrs.	90

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

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:

K. VIJAYAKUMAR, MCA., M.Phil.,
Head, Dept. of Information Technology,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT5E3			**Title**	**Batch:**	2022 - 2025
				Core Elective – I : E-Commerce	**Semester:**	V
Lecture Hrs./Week	6	**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 corporates. **Business Models**: Introduction – E-Business models based on the relationship of transaction parties and transaction types.	18
Unit II	**E-Marketing:** Traditional Marketing – Identifying web presence goals – Online marketing – E-Advertising – Internet marketing trends – Target Markets – Marketing strategies.	18
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.	18
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.	18
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.	18
	Total Contact Hrs.	90

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

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

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.

Web References:

- 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
Name and Signature	Name and Signature	CDC	COE
Name: V.Prabavathi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT516			Title	Batch:	2022 - 2025
				Core Lab. – VII : Python Programming	Semester:	V
Practical Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	3

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	CO Statement	Knowledge
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	PO 9	PO10	PSO 1	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**

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
Name: C.R. Durga devi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT517			**Title**	**Batch:**	2022 - 2025
				Core Lab - VIII : VisualProgramming	**Semester:**	V
Practical Hrs./Week	4	**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 Statements	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	PO 9	PO10	PSO 1	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 **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 (track bar, panel, tree view) 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, Splitters, Track bars, Pickers,Timers). 10. Create application using Image lists, Tree and list views, tool Bars, Status andProgress Bars and tab).	60

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group task (Group Discussion)

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: V.Prabavathi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT5AL			**Title**	**Batch:**	2022 - 2025
				Advanced Learner Course – I : R Programming (Optional)	**Semester:**	V
Lecture Hrs./Week	SS	**Tutorial Hrs./Sem.**	-		**Credits:**	5*

Course Objective

To provide understanding of various concepts of R Programming like functions, variables,data types and standardizing 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 a broad understanding of techniques of R Programming	K1
CO2	To understand the structural design of R Programming	K2
CO3	To apply R Programs in real time	K3
CO4	To analyze the issues associated with R Programming	K4
CO5	To Determine the various concepts of R Programming	K5

Mapping

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

Units	Content
Unit I	Introduction: Goals – Installing - Choosing an IDE: Emacs/ESS – Eclipse/Architect – Rstudio – Revolution-R – Live-R – Others. A Scientific Calculator: Goals – Operations and Vectors – Assigning Variables – Special Numbers – Logical vectors. Inspecting variables and your workspace: Classes – types and Numbers – otherclasses – Checking and Changing – Examining – workspace. Vectors, Matrices and Arrays.
Unit II	Lists and Data formats: Lists – Creation – Atomic and Recursive – Dimension and arithmetic – Indexing – Conversion – Combination – Data frames – Creation – indexing – Manipulation. Environments and functions: Environments – Functions – Creation – passing functions to and from other functions – variable scope. Strings and factors.
Unit III	Flow control and Loops: Flow control – Loops. Advanced Looping: Replication – Looping over lists – arrays – Multiple input apply – Split-apply-combine – the plyr package. Packages: Loading Packages – Installing – Maintaining.
Unit IV	Dates and Times: Date and time classes – Conversion to and from Classes- Time zones – Arithmetic and Dates and Times – Lubridate**. The Data Analysis workflow:** Getting data: Built in Datasets – Reading Text Files – Binary Files – Web data – Accessing Databases.
Unit V	Cleaning and Transforming: Cleaning Strings – Manipulating Data Frames – Sorting – Functional Programming. Exploring and Visualizing: Statistics Summary – Three Plotting Systems – Scatter Plots – Line Plots – Histograms – Box Plots – Bar charts – Other packages and Systems.

Pedagogy

Seminar, Digital Presentation, Chalk and

Assessment Methods

Test, Quiz, Assignment, Group task.

Text Book

- Richard Cotton,(2019) *A step by step Function Guide to Data Analysis – Learing R.* Shroff Publishers & Distributors Pvt. Ltd. ISBN: 978-93-5110-286-1

Reference Books

- Nina Zumel, (2014) *Practical Data Science with R***,** Dreamtech Press Publisher, ISBN: 9789351194378.
- Hadley Wickham, (2019) *Advanced R*, Second Edition, CRC Publisher, ISBN: 978-0815384571, 2019

Web References

- https://www.w3schools.com/r/r_intro.asp
- https://www.tutorialspoint.com/r/index.htm

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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head, Dept. of Information Technology
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT5S1			**Title**	**Batch:**	2022 - 2025
				Skill Based Lab. - II : Web Development (PHP)	**Semester:**	V
Practical Hrs./Week	3	**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 websiteusing database.	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.	45

Pedagogy:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Discussion

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: V.Prabavathi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT5S2			**Title**	**Batch:**	2022 - 2025
				Skill Based Lab. - II : Web Development (ASP.net)	**Semester:**	V
Practical Hrs./Week	3	**Tutorial Hrs./Sem.**	--		**Credits:**	2

Course Objective

To know various scripting concepts, tags in ASP.net Programming and creating web page.

Course Outcomes

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

CO Number	CO Statement	KnowledgeLevel
CO1	To make use of the different controls in asp.net.	K3
CO2	To analyze various applications in the web.	K4
CO3	To create websites withdatabase.	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	M	H	H	H	H	M	H	M	H	H		H
CO2	M	H	M	H	M		H			H		
CO3		H	H	H	H	M	H	M	H	H		H
CO4	H	H	M		M		M	M				H
CO5	H	H	M	M		M	M	M		**H**		

Content	Hrs.
SAMPLE PROGRAM LIST **Test - 1** 1. Execute a simple program using web controls. 2. To work with states of ASP.Net pages and Ad rotator control. 3. To work with calendar control, tree view control & validation control. 4. Develop Interactiont with a user in a form with radiobuttons 5. Execute Return session id number for auser 6. Execute Get a session'stimeout **Test - 2** 7. Execute query textbox and display records in by using database. 8. To make use of database for inserting and deleting records using database. 9. To execute data grid and its control template. 10. Develop Interaction with a user in a form that uses the "post"method. 11. Create a simple application usingdatabase.	45
Total Contact Hrs.	45

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Discussion

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: V.Prabavathi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22VIT501			**Title**	**Batch:**	2022 - 2025
				Value Added Course - I : Social Networks	**Semester:**	V
Lecture Hrs./Week	30 Hrs.	**Tutorial Hrs./Sem.**	-		**Credits:**	-

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

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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head,Dept. of Information Technology,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT618			**Title**	**Batch:**	2022 - 2025
				Core XIV : Open Source Methodologies	**Semester:**	VI
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	_		**Credits:**	4

Course Objective

On successful completion of this subject the students should have the knowledge about Unix & Linux Operating System concepts, normal & administrative commands and Android application development.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To remember the various Unix commands for directory, editor, shell programming. Android layers, components, and user interfaces.	K1
CO2	To get the idea of the Unix, Linux, and Android program commands.	K2
CO3	To execute the programs by using the various Unix, Linux commands.	K3
CO4	To review by using the commands and operations get proper output.	K4
CO5	To Assess the commands of Unix and Linux.	K5

Mapping

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

Units	Content	Hrs. L+T
Unit I	**Getting Started:** Introduction – UNIX, Linux and GNU – Programming Linux-Getting help. **The VIM Editor:** History – Creating and editing a file – features. Command Mode: moving the cursor – Deleting and changing text. Input Mode - Searching and substituting – *Miscellaneous commands* – yank, put and delete commands – Reading and writing files – Setting parameters – Advanced editing techniques – Units of measure.	16
Unit II	**Shell Programming:** Usage – Philosophy – Definition – Pipes and redirection – As a programming language – Syntax – Graphical (Dialog Utility).	15
Unit III	**Working with Files:** Linux file structure – System calls and device drivers – Low level file access – *Standard I/O file library – File and directory maintenance – Scanning directories. **Linux Environment.**	15
Unit IV	**Android:** Introduction – Features – AOS versions – Google play - Packages – ASDK – OOP – Test driving Tip calculator App in AVD – Build Apps – Development resources.	14
Unit V	**Welcome App:** Introduction – Overview – Creation – Android studio Window – Building App's GUI with layout editor – Run Welcome App – Making your App accessible – Internationalizing App.	15
	Total Contact Hrs.	75

Pedagogy

Digital Presentation, Chalk and talk, Flipped Class

Assessment Methods

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

Text Books

- Neil Matthew and Richard Stones, (2006), *Beginning LINUX Programming*, 3rd Edition, WileyDream Tech Publications (Units I – III).
- .Paul and Harvey Deitel, (2018), *Android 6 for Programmers*, 3rd Edition, Pearson Education Pubications. (Units IV & V),

Reference Books

- Sumithaba Das,(2006), *Unix Concepts and Applications*, Version 4.
- Mark G. Sobell, (2004), *A Practical Guide to Red Hat Linux 8*, Pearson Education, Edition.
- Jang, (2003), *Mastering Red Hat Linux Fedora Core 5*, Wiley Pub.

Web References

- https://maker.pro/linux/tutorial/basic-linux-commands-for-beginners
- https://www.tutorialspoint.com/android/index.htm

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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head, Dept. of Information Technology
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT6E1			**Title**	**Batch:**	2022 - 2025
				Core Elective – II : Big Data Analytics	**Semester:**	VI
Lecture Hrs./Week	6	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

To cultivate knowledge of big data analytics technologies and to transform the business.

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. L+T
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	18
Unit II	**The Big Data Technology Landscape**: NoSQL – Hadoop. **Introduction to Hadoop**: Introduction – Need- RDBMS Versus Hadoop – Distributed Computing Challenges – History – Overview – Use case – Distributors – HDFS – Processing Data with Hadoop – Managing Resources And Applications With Hadoop YARN – Interacting With Hadoop Ecosystem- **Few Interesting Differences.**	18
Unit III	**Apply Analytics :** Evolution of analytics-Text analytics-Speech analytics-Video/image analytics-Behavior analytics-Combined analytics-Transparency-Prediction vs. privacy	18
Unit IV	**Report Results :** Data visualization-New data visualization-Displaying behavior & emotions-Displaying connections-How to improve data visualization-Info graphics - Beware the self-service business intelligence tools-The ingredients of successful data visualization and info graphics - Management dashboards	18
Unit V	**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	18
	Total Contact Hrs.	90

Pedagogy:

Digital Presentation, Chalk and talk, Flipped Class

Assessment Methods:

Test, Quiz, Assignments

Text Books:

- Seema Acharya, Subashini Chellapan, (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. Vijayalakshmi Radha Shankarmani (2016) "Big Data Analytics",Kindle Edition,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/

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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head,Dept. of Information Technology,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT6E2			**Title**	**Batch:**	2022 - 2025
				Core Elective – II : Machine Learning	**Semester:**	VI
Lecture Hrs./Week	6	**Tutorial Hrs./Sem.**	-		**Credits:**	4

Course Objective

To cultivate knowledge about concepts and techniques of Machine Learning.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To Understand the basic concepts and techniques of Machine Learning.	K1
CO2	To understand the concepts of regression methods, classification methods, clustering methods	K2
CO3	To apply the inference and learning algorithms for the hidden Markov model.	K3
CO4	To evaluate the results for Dimensionality reduction Techniques	K4
CO5	To determine the mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and un-supervised learning.	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. L+T**
Unit I	Introduction – Types of Machine Learning – Supervised Learning – The Brain and the Neuron – Design a Learning System – Perspectives and Issues in Machine Learning – Concept Learning Task – Concept Learning as Search – Finding a Maximally Specific Hypothesis –Version Spaces and the Candidate Elimination Algorithm–Linear Discriminants–Perceptron–Linear Separability – Linear Regression.	18
Unit II	Linear Models–Multi-Layer Perceptron–Going Forwards–Going Backwards: Back Propagation Error – Multi-Layer Perceptron in Practice – Examples of using the MLP–Overview–Deriving Back-Propagation–Radial Basis Functions and Splines–Concepts–RBF Network–Curse of Dimensionality– Interpolations and Basis Functions–Support Vector Machines.	18
Unit III	Tree and Probabilistic Models–Learning with Trees–Decision Trees–Constructing Decision Trees – Classification and Regression Trees – Ensemble Learning – Boosting – Bagging – Different ways to Combine Classifiers – Probability and Learning – Data into Probabilities–Basic Statistics– GaussianMixtureModels–NearestNeighborMethods–UnsupervisedLearning–Kmeans Algorithms– Vector Quantization–Self Organizing Feature Map.	18
Unit IV	Dimensionality Reduction and Evolutionary Models-Dimensionality Reduction–Linear Discriminant Analysis–Locally Linear Embedding–Iso map–Least Squares Optimization–Evolutionary Learning– Genetic Algorithms–Genetic Offspring–Genetic Operators– Using Genetic Algorithms–Reinforcements Learning–Overview–Getting Lost Example–Markov Decision Process.	18
Unit V	Graphical Models – Markov Chain Monte Carlo Methods– Sampling – Proposal Distribution –Markov Chain Monte Carlo – Graphical Models – Bayesian Networks – Markov Random Fields–Hidden Markov Models–Tracking Methods.	18
	Total Contact Hrs.	90

Pedagogy:

Digital Presentation, Chalk and talk, Flipped Class

Assessment Methods:

Test, Quiz, Assignments

Text Books:

- Ethem Alpaydin, (2014) "Introduction to Machine Learning3e(Adaptive Computation and Machine Learning Series)",Third Edition, MIT Press.

Reference Books:

- Jason Bell(2014), "Machine Learning– Hands on for Developers and Technical professionals", First Edition, Wiley Publications.
- Peter Flach, (2012) "Machine Learning: The Art and Science of Algorithms that Make Sense of Data", First Edition, Cambridge University Press.

Web References:

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

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: V.Prabavathi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT6E3			**Title**	**Batch:**	2022 - 2025
				Core Elective - II Block Chain Technology	**Semester:**	VI
Lecture Hrs/Week:	6	Tutorial Hrs./ Sem.	-		**Credits:**	4

Course Objective

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

Course Outcomes

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

CO1	To keep in mind the fundamentals of Blockchain technology and crypto currency	K1
CO2	To understand the mining mechanism in Blockchain.	K2
CO3	To apply and identify security measures, and various types of services that allow people to trade and transact with bitcoin.	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 Crypto currencies 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.	**18**
Unit IV	**Cryptocurrency Regulation:** Cryptocurrency Regulation - Stakeholders, Roots of Bit coin, Legal views - exchange of crypto currency - Black Market - Global Economy. Crypto-economics – assets, supply and demand, inflation and deflation – Regulation.	**18**
Unit V	**Challenges in Block Chain:** Opportunities and challenges in Block Chain – Application of block chain: Industry 4.0 – machine to machine communication – Data management in industry 4.0 – future prospects. Block chain in Health 4.0 - Blockchain properties - Healthcare Costs - Healthcare Quality - Healthcare Value - Challenges for using block chain 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*"

Reference Books:

- 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**

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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head, Dept. of Information Technology
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT6E4			**Title**	**Batch:**	2022 - 2025
				Core Elective – III : Cloud Computing	**Semester:**	VI
Lecture Hrs./Week	6	**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.	18
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.	17
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.	17
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.	19
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.	19
	Total Contact Hrs.	**90**

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

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

Text Book

- Arshdeep Bahga, 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. Mc Graw 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

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:

K.VIJAYAKUMAR, MCA.,M.Phil., Head,Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.

K. SRINIVASAN, M.C.A., Co-ordinator Curriculum Development Cell (CDC) NGM College (Autonomous) Pollachi - 642 001.

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:	22UIT6E5			**Title**	**Batch:**	2022 - 2025
				Core Elective III: Internet of Things (IoT)	**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 Outcomes

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.	16
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.	16
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.	20
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)

Programme Code:	B.Sc. - IT	Programme Title :	Information Technology

22UIT6E5

Text Book

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

Reference Books

- Vijay Madisetti and Arshdeep Bahga, (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 References

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

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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head,Dept. of Information Technology,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

Dr. R.MANICKA CHEZIAN, M.Sc.,M.S.,Ph.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Course Code:	22UIT6E6			Title:	Batch :	2022 - 2025
				Core Elective – III Mobile Computing	Semester :	VI
Lecture Hrs./Week:	6	Tutorial Hrs./Sem.	-		Credits :	4

Course Objective

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

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To keep in mind the various networks, standards, communication medium, Spread spectrum techniques.	K1
CO2	To Understand the basic concepts of wireless networks.	K2
CO3	To deploy the mobile applications to the devices.	K3
CO4	To analyze the various wireless networks technologies.	K4
CO5	To evaluate the importance of mobile communications.	K5

Mapping

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

Units	Content	Hrs.
Unit I	**Introduction**: Mobility of Bits and Bytes –Wireless The Beginning – Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Application and services - Security in mobile computing – Standards _ Why is it necessary – Standard bodies. **MOBILE COMPUTING ARCHITECTURE**: Architecture for mobile computing – Three-tier architecture – Mobile computing through Internet – Making existing applications mobile enabled	17
Unit II	**MOBILE COMPUTING THROUGH TELEPHONY**: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – IVR Application – Voice XML – TAPI. **EMERGING TECHNOLOGIES:** Blue Tooth – RFID – WiMAX – Mobile IP – IPv6 – Java Card.	17
Unit III	**GSM:** Global System for mobile communications – GSM Architecture – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – GSM Frequency allocations – Authentications and Security. **SMS:** Strengths – Architecture – SM MT – SM MO – VAS through SMS.	18
Unit IV	**GPRS:** GPRS and packet data network – Architecture – Network Operations – Data services – Applications - Limitations – Billing and Charging. **WAP**: WAE – User agent & UAProf – WML – WSP – WTP – WDP – Gateway. **MMS**: Architecture – Transaction Flows.	18
Unit V	**CDMA and 3G**: Spread spectrum technology. **IS 95**: Speech and Channel Coding – Architecture – Channel Structure. CDMA vs. GSM – Wireless Data. **3G:** IMT & CDMA 2000 – Applications on 3G. **WIRELESS LAN:** Advantages – IEEE 802.11 standards - Types – 802.11 Architecture – Mobility – Deploying – Mobile Ad Hoc networks and sensor networks – Security – WiFi vs. 3G. **4G & 5G:** Introduction - Architecture.	20
	Total Contact Hrs.	90

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

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

Text Book

- Asoke K Talukder, Roopa R Yavagal. (2005), *Mobile Computing*, TMH.

Reference Books

- Jochen Schiller, (2008), *Mobile Communication*, Second Edition, Pearson Education Asia.
- Christoffer Andersson (2001), *GPRS and 3G Wireless Applications*, John Wiley and son's pub.

Web References

- https://www.tutorialspoint.com/mobile_computing/index.htm
- https://www.javatpoint.com/mobile-computing

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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT619			**Title**	**Batch:**	2022 - 2025
				Core Lab. – IX : Open Source Methodologies (Linux)	**Semester:**	VI
Practical Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	3

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** **U**sing 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. 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** **U**sing 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

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
Name: R. Sekar 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
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT620			**Title**	**Batch:**	2022 - 2025
				Core Lab - X : Software Testing Tools	**Semester:**	VI
Practical Hrs./Week	4	**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 wesites 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. 4. Create Library management system and test using the tool. 5. Create Banking system and test using the tool. **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.	60

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
Name and Signature	Name and Signature	CDC	COE
Name: V.Prabavathi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT621			Title	Batch:	2022 - 2025
				Project	Semester:	VI
Practical Hrs./Week:	-	Tutorial Hrs./Sem.	-		Credits:	2

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

INFORMATION TECHNOLOGY PROJECT

Guidelines

Introduction

The title of the project work and the organization will be finalized at the end of fourth Semester and System study report submit on 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 computer science lab. as well as in the organization. Periodical review will be conducted to monitor the progress of the project work. Project report will be prepared and submitted at the end of the sixth semester. External examiner appointed by the Controller of Examination will conduct the viva voce examination along with 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, etc.
- System Software
- Web Security Projects

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 from Organization (Mandatory)
3. Declaration
4. Acknowledgement
3. Synopsis
4. Table of Contents .
5. Chapters
6. Appendix
7. Reference

Format of Table of Contents

TABLE OF CONTENTS

Chapter No. **Title** **Page No.**

3.4 Table Design

3.5 Supporting Diagrams (ER/DFD/UseCase)

4. Implementation and Testing

4.1 Coding Methods

4.2 Testing Approach

4.3 Implementation and Maintenance

5. Project Evaluation

5.1 Project Outcome

5.2 Limitation of the Project

5.3 .Further Scope of the Project

6. Conclusion

7. Appendix

7.1 Screenshots and Reports

8. References

Size of the Project

The Project Report contents should be maximum of not exceeding 60 pages

Assessment Method

Internal Assessment: 20 Marks

Criterion	Mode of Evaluation	Marks	Total
I	Synopsis, Company profile, System Specification, Existing system, Proposed system Upto System Study	10	20
II	Supporting Diagrams like system flowchart, ER, DFD, Usecase and Table Design	5	
III	Coding, Input forms, Output format, testing	5	

External Assessment: 80 Marks

Mode of Evaluation	**Marks**	**Total**
Project Report		
Title Relevance of the Industry/Insitute	10	60
Technology	10	
Design and development Publishing	20	
Testing, Report	20	
Viva Voce		
Project Presentation	10	20
Q&A Performance	10	

Content	Hrs. P+T
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 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	30+30
Total Contact Hrs.	60

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:

K.VIJAYAKUMAR, MCA.,M.Phil.,
Head, Dept. of Information Technology,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT6AL			**Title**	**Batch:**	2022 - 2025
				Advanced Learner Course II : R Programming Lab.(Optional)	**Semester:**	VI
Practical Hrs./Week	Self-Study	**Tutorial Hrs./Sem.**	-		**Credits:**	5*

Course Objective

To apply various concepts of R language.

Course Outcomes

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

CO	CO Statement	Knowledge
CO1	To deploy programs using control structures	K3
CO2	To analyze the vector, files and data frame usage in program generation	K4
CO3	To select appropriate tools for data analysis in R	K5
CO4	To verify the usage of data frame usage in program generation	K5
CO5	To create applications using R in built packages and functions	K6

Mapping

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

Content

SAMPLE PROGRAM LIST

1. Develop a Program to print the numbers from 1 to 30 and print "Fizz" for multiples of 3, print "Buzz" for multiples of 5, and print "FizzBuzz" for multiples of both.
2. Develop a Program to get all prime numbers up to a given number
3. Develop a Program to find the maximum and the minimum value of a given vector
4. Develop a Program to read the .csv file and display the content
5. Develop a Program to create a simple bar plot of five subjects marks.
6. Develop a Program to create a Dataframes which contain details of 5 employees and display the details.
7. Develop a Program to list containing a vector, a matrix and a list and give names to the elements in the list
8. Develop a Program to create a matrix taking a given vector of numbers as input. Display the matrix
9. Develop a Program to get the unique elements of a given string and unique numbers of vector.
10. Develop a Program to add new row(s) to an existing data frame
11. Develop a Program to replace NA values with 3 in a given data frame
12. Develop a Program to extract specific column from a data frame using column name

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
Name: C.R. Durga devi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT6S1			**Title**	**Batch:**	2022 - 2025
				Skill Based Lab. III - Naan Mudhalvan (Photoshop)	**Semester:**	VI
Practical Hrs./Week	3	**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.	**45**
Total Contact Hrs.	45

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
Name: B. Kalaiselvi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22UIT6S2			**Title**	**Batch:**	2022 - 2025	
				Skill Based Lab. III - Naan Mudhalvan (CorelDraw)	**Semester:**	VI	
Practical Hrs./Week	3	**Tutorial Hrs./Sem.**	-		**Credits:**	2	

Course Objective

To learn, apply and create various designing concepts of CorelDraw.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To deploy basic geometric shapes	K3
CO2	To examine various line tools.	K4
CO3	To choose manipulation of images	K5
CO4	To verify filters options	K5
CO5	To create layers	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. Draw the Basic geometric shapes using tools. 2. Draw different type of lines using line tools. 3. Create an image and manipulate it. 4. Perform Image extraction and merging of images 5. Animate text using Text tool. 6. Create a table then insert Data and highlight it. 7. Create image and insert Text on image. 8. Draw sunflower and apply editing tools. 9. Perform image Filter operations. 10. Creating layer and modify layer properties.	**45**
Total Contact Hrs.	**45**

Web Reference

- https://www.tutorialspoint.com/listtutorial/Corel-Draw-Tutorial---New-Product-Flyer/4249
- https://www.youtube.com/watch?v=TpbFHCEvnpY
- https://www.youtube.com/watch?v=w9c8OuJOADo
- https://www.youtube.com/watch?v=TKDuNJxaeRE

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: V.Prabavathi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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:	22VIT602			**Title**	**Batch:**	**2022-2025**
				Value Added Course - 2	**Semester:**	VI
Lecture Hrs./Week	30 Hrs.	**Tutorial Hrs./Sem.**	-	**Crux of Cyber Security and Crime**	**Credits:**	-

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. Jeetendra Pande, "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.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: V.Prabavathi 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,
NGM College (Autonomous),
POLLACHI - 642 001.

K. SRINIVASAN, M.C.A.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

Dr. R.MANICKA CHEZIAN, M.Sc.,M.S.,Ph.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.