

Nallamuthu Gounder Mahalingam College

Department of Information Technology

Vision

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

Mission

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

Program Educational Objectives:

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

Program Outcomes:

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

Program Specific Outcomes:

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

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

EM – Blue SD – Green EN – Yellow

NGM College - Department of Information Technology Scheme of Examination For 2023 - 2026 Choice Based Credit System & OBES										
SEMESTER - I										
Part	Subject Code	Title of the Paper	Hrs / Week		Hrs / Sem.	Exam Hrs.	Maximum Marks		Total Marks	Credits
			L	P	T		Internal	External		
I	23UTL1C1	Tamil Paper - I	5	-	-	3	25	75	100	3
	23UHN1C1	Hindi Paper - I		-	-					
	23UFR1C1	French Paper – I		-	-					
II	23UEN101	Communication Skills – I (Level I) /	5	-	-	3	25	75	100	3
	23UEN102	Communication Skills – I (Level II)		-	-					
III	23UIT101	CC - I : Programming in 'C'	4	-	4	3	25	75	100	4
	23UIT102	CC - II : Computer System Architecture	4	-		3	25	75	100	4
	23UIT1A1/ 23UIT1A2	GE I - Allied I : Mathematics - I (Statistics)/Numerical Methods	4	-	5	3	25	75	100	4
	23UIT103	CC Lab - I : Programming in 'C'	-	4	-	3	20	30	50	2
	23UIT104	CC Lab. – II : Web Designing (HTML& DHTML)	-	2	-	3	20	30	50	2
IV		AECC I: Environmental Studies	1	-	-	-	-	-	-	-
	23HEC101	Human Excellence - Personal Values & SKY Yoga Practice - I	1	-	-	2	20	30	50	1
V		Extension Activities – Annexure I	-	-	-	-	-	-	-	-
EC		Online Course (Optional) (MOOC / NPTEL / SWAYAM)								Grade
Total			24	6	9				650	23

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

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

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

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

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

SEC – Skill Enhancement Course

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT101			Title	Batch:	2023 - 2026
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	4	CC I: Programming in 'C'	Semester:	I
					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 – scanf (), printf (). Strings: Declaration and initialization, displaying, standard functions and applications. Pointers: Futures, Declarations, arithmetic operations, pointers and arrays, two dimensional arrays, array of pointers, pointers to pointers, pointers and strings, void pointers.	10+1
Unit IV	Functions: Definition, declaration, return statements, types, call by value and reference, returning more multiple values, function as an argument, function with arrays and pointers. Structure and Union: Features of structure, Declaration and initialization of structure, Structure within structure, Array of structure, Pointer to structure, structure and functions, typedef, Bit fields, Enumerated data types, Union, union of structures.	11+1
Unit V	Files: Streams and file types, Steps for file operation, File I/O, Structures read and write, Other file functions, searching errors in reading or writing files, low level disk I/O, Command line arguments, I/O redirection. Preprocessor directives: #define, #include, #ifndef, #error, #line, #pragma, and Predefined macros.	10+1
	Total Contact Hrs.	60

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

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

Text Book

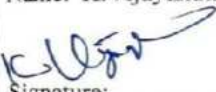
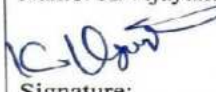
- ❖ Ashok .N. Kamthane. (2009). *PROGRAMMING AND DATA STRUCTURES*. First Indian Print. Pearson Education: ISBN 978-81-317-2423-4.

Reference Books

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

Web Reference

- ❖ <https://www.tutorialspoint.com/cprogramming/index.htm>

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

K.VIJAYAKUMAR, MCA., M.PHIL.,
head, Dep. 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:	23UIT102			Title	Batch:	2023 - 2026
				CC- II : Computer System Architecture	Semester:	I
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

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

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To remember basic building block of digital computer system	K1
CO2	To understand the execution sequence of instruction through the processor	K2
CO3	To apply interfacing of various peripheral devices used with the system	K3
CO4	To analyze functioning of various parts of the computer from hardware point of view	K4
CO5	To judge the pros and cons of various types of memory organizations	K5

Mapping

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

Units	Content	Hrs.
Unit I	Binary Systems: Numbers – Conversions – Complements – Codes – Logic. Canonical & Standard Forms. Digital Logic Gates. Simplification of Boolean Functions: Map method – Two & Three Variable Map – Four Variable Map.	13
Unit II	Basic Computer Organization and Design: Instruction Codes - Computer Registers – Computer Instructions – Instruction Cycle – Memory Reference Instructions – InputOutput and Interrupt.	12
Unit III	Central Processing Unit (CPU): General Register Organization – Stack Organization - Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control.	12
Unit IV	Input – Output Organization: Peripheral Devices- Input – Output Interface – Asynchronous Data Transfer - Direct Memory Access (DMA) - CPU-IOP Communication.	11
Unit V	Memory Organization: Memory Hierarchy – Main Memory - Auxiliary Memory - Cache Memory – Associative Memory - Virtual Memory.	12
	Total Contact Hrs.	60

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

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

Text Book

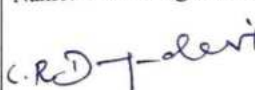
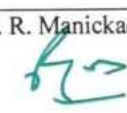
- ❖ M. Morris Mano. (2023), Computer System Architecture, Revised 3rd Edition .Pearson.

Reference Books

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

Web Reference

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

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: C.R. Durga devi 	Name: K.Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	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. MANICKACHEZIAN, 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:	23UIT1A1			Title:	Batch :	2023 - 2026
Lecture Hrs/Week:	4	Tutorial Hrs./Sem.	5	GE I – Allied I: Mathematics – I (Statistics)	Semester :	I
					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 between mean, 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 between correlation & 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 of significance for large samples and small samples. Chi Square Test: Introduction – χ^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 Chand and 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: V.Prabavathi V. Prabavathi Signature:	Name: K.Vijayakumar K. Vijayakumar Signature:	Name: Mr. K.Srinivasan K. Srinivasan Signature:	Name: Dr. R. Manickachezian 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. MANICKACHEZIAN, 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:	23UIT1A2			Title:	Batch :	2023 - 2026
Lecture Hrs/Week:	4	Tutorial Hrs./Sem.	5	GE I – Allied I: Numerical Methods	Semester :	I
					Credits :	4

Course Objective

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

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To remember numerical analysis techniques	K1
CO2	To understand the solution to problems of algebraic and transcendental equations, simultaneous linear equations.	K2
CO3	To solve the problems using Newton forward and backward interpolation	K3
CO4	To analyze the differential equations	K4
CO5	To evaluate the ordinary differential equations	K5

Mapping

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

Units	Content	Hrs. L+T
Unit I	The solution of Numerical Algebraic and Transcendental Equations: Introduction - The Bisection method - The iteration method - The method of false position (Regula - Falsi Method) - Newton Raphson method. Simultaneous Linear Algebraic Equations: Introduction – Gauss Elimination Method – Gauss Jordan Method – Computation of the inverse of a Matrix using Gauss's Elimination Method.	15
Unit II	Simultaneous Linear Algebraic Equations: Iterative Methods - Gauss-Jacobi Method – Gauss-Seidal Method – Comparison of Gauss elimination and Gauss-Seidal Iteration methods.	9+1
Unit III	Interpolation: Introduction - Linear interpolation - Gregory Newton Forward and Backward interpolation Formula - Equidistant terms with one or more missing values.	9+1
Unit IV	Numerical Differentiation: Introduction - Newton's forward difference formula to compute the derivatives - Newton's backward difference formula to compute the derivatives. Numerical Integration: The Trapezoidal rule - Simpson's one third rule – three fourth rule.	13+1
Unit V	Numerical Solution of Ordinary Differential Equations: Solution by Taylor Series - Taylor Series method for higher order differential equations- Euler's method - Improved Euler's method - Modified Euler method - RungeKutta method - Second order RungeKutta Method	13+1
	Total Contact Hrs.	60

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

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

Text Book:

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

Reference Books

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

Web Reference

- ❖ <https://nptel.ac.in/courses/111107105>

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: V.Prabavathi V. Prabavathi Signature:	Name: K.Vijayakumar K. Vijayakumar Signature:	Name: Mr. K.Srinivasan Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian 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. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Employability100% & Skill Development100%

Programme Code:	B. Sc. - IT			Programme Title:	Information Technology	
Course Code:	23UIT103			Title	Batch:	2023 - 2026
Practical Hrs./Week:	4	Tutorial Hrs./Sem.	-	CC Lab. - I Programming in „C“	Semester:	I
					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	-	-	-

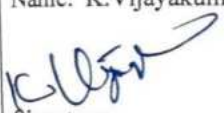
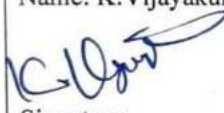
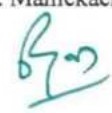
Content	Hrs.
SAMPLE PROGRAM LIST Test I 1. Execute a C program to implement basic operators. 2. Execute a C program to implement if, if-else, nested if. 3. Develop a C program to implement switch case. 4. Develop a C program to implement while loop. 5. Create a C program to implement do-while loop. 6. 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 	Name: K.Vijayakumar 	Name: Mr. K.Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	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. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Employability100% & Skill Development100%

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

Course Objective

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

Course Outcomes

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

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

Mapping

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

Content	Hrs.
SAMPLE PROGRAM LIST Test I(HTML) 1. Experiment with Webpage creation using CSS. 2. Apply Ordered List and Un-Ordered List in web pages 3. Apply Table Tags in web pages 4. Experiment with Frame creation. 5. Apply Font Attributes in web pages 6. Apply Style sheets in web pages Test II (DHTML) 1. Write a DHTML program for changing Background colour 2. Write a DHTML program for events of KEYUP AND KEYDOWN 3. Write a DHTML program for events ONSUBMIT AND ONFOCUS 4. Write a DHTML program for generating blinking header 5. Write a DHTML program for moving and shaking an Image	30

Pedagogy:

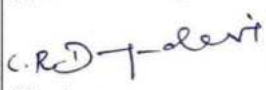
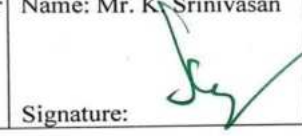
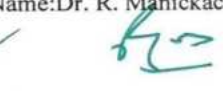
Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Task(GD)

WEB REFERENCES:

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

Course Designed by Name and Signature	Verified by HOD Name and Signature	Checked by CDC	Approved by 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. MANICKACHEZIAN, 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:	23UIT205			Title	Batch:	2023 - 2026
				CC - III: Object Oriented Programming with Java	Semester:	II
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

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

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To keep in mind the basic concepts of OOPs	K1
CO2	To apprehend a knowledge about how to use java for internet applications	K2
CO3	To implement file, applet, thread concepts for web applications	K3
CO4	To review the usage of packages, exceptions and string concept for developing stand - alone java programs	K4
CO5	To assess the various types of stream classes and file handling	K5

Mapping

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

Units	Content	Hrs.
Unit I	Fundamentals of Object Oriented Programming: Introduction – Paradigm - Basics – Benefits – Applications. Java Evolution: History – Features – Difference from C/C++ – Web browsers – Hardware and software requirements – Support systems –Environment. Overview of Java language. Constants, Variables and Data types.	12
Unit II	Classes, Objects and Methods: Introduction – Defining – Field, Method Declaration – Creating Objects – Accessing class members – Constructors – Method Overloading - Static Members – Nesting of Methods – Inheritance – Overriding – Final Variables, Methods and Classes. Finalizer Methods – Abstract methods and classes – Methods with Varargs – Visibility control. Arrays, Strings and Vectors: Introduction – One dimensional – Creation – Two-dimensional – Strings - Vectors – Wrapper classes – Enumerated types – Annotations. Interfaces: Multiple Inheritance.	13
Unit III	Packages: Putting classes together: Introduction – API packages – System packages – Naming Conventions – Creation – Accessing – Using – Adding a Class to a package – Hiding classes – Static import. Multithreaded Programming : Introduction – Creation – Extending – Stopping and blocking – Life cycle – Using thread methods – Exceptions – Priorities – Synchronization – Implementing the Runnable interface – Inter-thread communication. Managing Errors and Exceptions.	12
Unit IV	Abstract Windowing Toolkit (AWT) - Applet Programming: Introduction – Difference between Applet and other Applications - Writing and Building Applet - Life Cycle – Creating Executable applets – Designing a Web page – Applet Tag – Applet to HTML – Running Applets – Passing Parameters – Aligning the display – HTML tags – Numerical Values – User input – Event Handling.	12
Unit V	Managing Input / Output Files: Introduction – Streams – Stream Classes – Byte Stream – Character Stream – Using Stream – Useful I/O Classes – File Classes – I/O Exceptions – File Creation – Reading Writing Characters and Bytes – Primitive Data Types – Concatenating and Buffering - Random Access File – Interactive I/O – Other Stream Classes.	11
	Total Contact Hrs.	60

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

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

Text Book

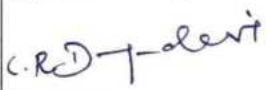
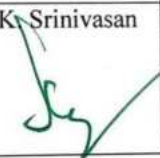
- ❖ E. Balagurusamy. (2019). “Programming with JAVA – A Primer”, Tata McGraw-Hill Publishing Company Limited, 6th Edition. (Unit I, II, III, V)
- ❖ Instructional Software Research and Development (ISRD) Group. 2001. “Introduction to Object Oriented Programming through Java”, Tata McGraw-Hill Publishing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

Reference Books

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

Web Reference

- ❖ https://youtu.be/uWYPVz_i7W4
- ❖ <https://youtu.be/7s3xDfdqfDw>

Course Designed by Name and Signature	Verified by HOD Name and Signature	Checked by CDC	Approved by COE
Name: C.R. Durga devi 	Name: K.Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	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. MANICKACHEZIAN, 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:	23UIT206			Title	Batch:	2023 - 2026
Lecture Hrs/Week:	4	Tutorial Hrs./Sem.	-	CC- IV: Data Structures	Semester:	II
					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 an Abstract 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

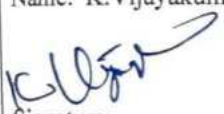
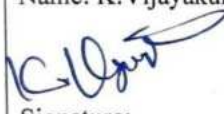
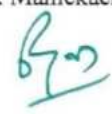
- ❖ ISRD group. (2010). Data structure using C. Seventh Reprint. Tata McGraw-Hill.

Reference Books

- ❖ Aaron .M. Tanenbaum, YedidyeLangsam, 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. MANICKACHEZIAN, 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:	23UIT2A1			Title	Batch:	2023 – 2026
				GE II – Allied II : Mathematics II (Discrete Mathematics)	Semester:	II
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	10		Credits:	4

Course Objective

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

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To remember the basic concepts of set theory, mathematical logic, relations and graph theory.	K1
CO2	To infer the basic terminology of discrete mathematics	K2
CO3	To construct discrete notations in the programs	K3
CO4	To analyze discrete concepts through programs	K4
CO5	To determine languages and grammars for programming	K5

Mapping

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

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

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Assignments

Text Book

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

Reference Books

- ❖ Kenneth H. Rosen. (2003). *Discrete Mathematics and Its Applications*, 5th Edition, McGraw Hill Pub.
- ❖ Dr. Venkataraman. M. K. Dr. Sridharan. N, Chandarasekaran. N. (2000). *Discrete Mathematics*. The National publishing Company Chennai.

Web Reference

- ❖ <https://www.youtube.com/watch?v=itrXYg41-V0>
- ❖ <https://www.youtube.com/watch?v=tyDKR4FG3Yw>
- ❖ <https://www.youtube.com/watch?v=HmQR8Xy9DeM>
- ❖ https://www.youtube.com/watch?v=19SW3P_PRHQ

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: B. Kalaiselvi 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	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. MANICKACHEZIAN, 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:	23UIT2A2			Title	Batch:	2023 – 2026
				GE II – Allied II : Operations Research	Semester:	II
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	10		Credits:	4

Course Objective

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

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To remember the concepts of linear programming methods	K1
CO2	To understand the concepts of transportation, networking, replacement, etc.,	K2
CO3	To solve the problems optimization techniques to solve the computer based business problems	K3
CO4	To analyze the ability of critical thinking, to find shortest time duration	K4
CO5	To evaluate the Economic order quantity	K5

Mapping

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

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

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods:

Test, Seminar, Assignments

Text Book

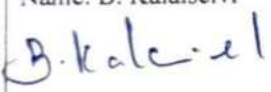
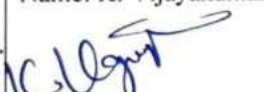
- ❖ KantiSwarup, PK Gupta, Man Mohan. (2020). *Operations Research*. Sultan Chand and Sons & Company Ltd. New Delhi.

Reference Books

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

Web Reference

- ❖ <https://rb.gy/6m3df>
- ❖ <https://rb.gy/mq3k4>

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: B. Kalaiselvi 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	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. MANICKACHEZIAN, 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:	23UIT207			Title	Batch:	2023 - 2026
Practical Hrs./Week	4	Tutorial Hrs./Sem.	-	CC Lab.-II: Programming in Java	Semester:	II
					Credits:	2

Course Objective

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

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To apply basic object oriented programming concepts in Java	K3
CO2	To analyze the usage of packages, exceptions in program development	K4
CO3	To prove the need of Applets in internet applications development	K5
CO4	To verify the database connectivity using Java	K5
CO5	To create forms using AWT components	K6

Mapping

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

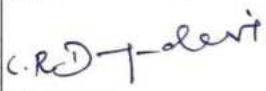
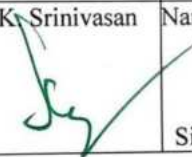
Content	Hrs.
SAMPLE PROGRAM LIST Test I 1. Develop a class using constructor. 2. Develop a Program using method overloading. 3. Develop a Program using method overriding. 4. Apply single and multi-dimensional array in assessing students performance 5. Apply multiple inheritance using interfaces. 6. Develop a Program using packages and sub packages. Test II 7. Develop a Program using threads. 8. Test for inter-thread communication in program 9. Test for Exception Handling in program 10. Develop a Program for designing shapes using applets. 11. Develop a Program to handle events. 12. Compose a form using AWT Components. 13. Develop a Program to generate files.	60

Pedagogy:

Direct Instruction, Digital Presentation
--

Assessment Methods:

Test, Assignments, Group task (Group Discussion)
--

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: C.R. Durga devi 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	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. MANICKACHEZIAN, M.Sc., M.S., Ph.D.
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Employability100% & Skill Development100%

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

Course Objective

To know 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 website using 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		

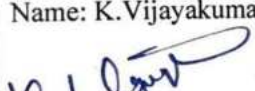
Content	Hrs.
SAMPLE PROGRAM LIST 1. Execute a PHP Program to print an array. 2. Execute a PHP Program to sort elements in an array in ascending and descending order. 3. Develop a PHP program to split a string as array elements based on delimiter. 4. Execute a PHP Program to combine the array elements 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.	30
Total Contact Hrs.	30

Pedagogy:

Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Discussion

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

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

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

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

EM – Blue SD – Green EN – Yellow

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

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

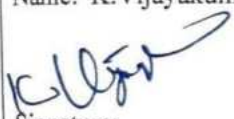
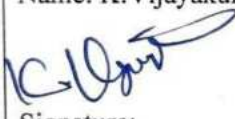
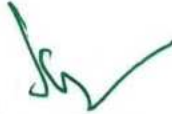
- ❖ H. M Deitel. (2003). *Operating Systems*, 2nd Edition, Pearson Education Publication.
- ❖ Abraham Silberschatz, Peter B. Galvin, Greg Gagne (2018), *Operating System Concepts*, 10th edition, Abridged Print Companion.

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, Dep. 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.

Employability100% & Skill Development100%

Programme Code:	B.Sc. - IT			Programme Title:	Information Technology	
Course Code:	22UIT308			Title	Batch:	2022 - 2025
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	-	Core VI: Relational Database Management System	Semester:	III
					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 - iSQL *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

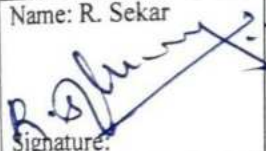
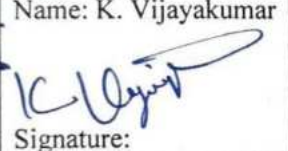
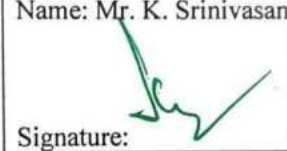
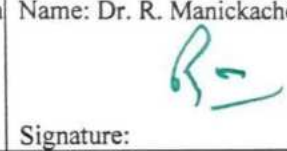
- ❖ Nilesh Shah. (2009), *Database Systems Using Oracle*, 2nd edition, PHI.

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=J5wjlf4gdq4>
- ❖ <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. MANICKACHEZIAN, 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	
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	-	Allied III : Microprocessor and Assembly Language Programming	Semester:	III	
					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	Introduction to Microprocessors: Evolution of microprocessors – Single- chip Microcomputer – Embedded Microprocessors – Bit - Slice processors – Microprogramming – RISC and CISC Processors – Scalar and Superscalar Processors – Vector Processors – Array Processors – Symbolic Processors – Digital Signal Processors Intel 8086 – Pin Description of Intel 8086 – Operating modes of 8086 – Register organization of 8086 – BIU and EU – Interrupts – 8086 based computer system – Addressing Modes of 8086.	16
Unit II	8086 Instruction Set – Instruction Groups – Addressing Mode Byte – Segment Register Selection – Segment Override – 8086 Instructions. Assembly Language Programs for 8086: 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 – Pentium II, III, IV - Alpha – Cyrix – MIPS – AMD Processors. Advanced Core Processors: Dual Core - Core2 Duo - i3 - i5 - i7 – i9 - Quad – Octa - Penta – Comparison. 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

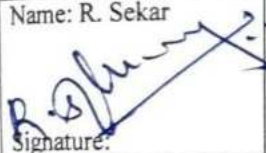
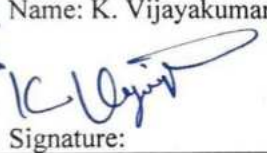
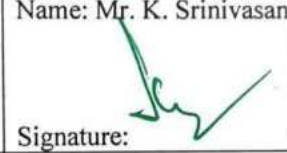
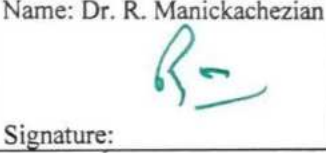
- ❖ A.K. Ray, K.M. Bhurchandi, (2007), *Advanced Microprocessors and Peripherals*. Tata McGraw-Hill Publishing Company Limited, 2nd Edition.p
- ❖ Ramesh S. Gaonkar, (1997), *Microprocessor Architecture, Programming, and Applications with the 8085*. 3rd Edition. PRI India.

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%20microproces sor.

(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 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 

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. MANICKACHEZIAN, M.Sc. M.S. Ph.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Employability100%&Skill Development100%

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	-	-

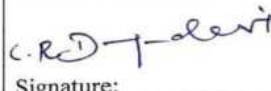
<u>Content</u>	<u>Hrs.</u>
<u>SAMPLE PROGRAM LIST</u> Test I 1. Experiment with DDL commands. 2. Make use of Constraints 3. Experiment with DML commands. 4. Make use of Arithmetic operations on tables. 5. Determine where clause usage 6. Experiment with Case structures 7. Make use of Built-in functions 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 Name and Signature	Verified by HOD Name and Signature	Checked by CDC	Approved by 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	PO9	PO10	PSO1	PSO2
CO1	L	M	M	L	L	M	M	L	L	H	L	M
CO2	L	M	L	L	L	L	H	L	H	H	L	M
CO3	L	M	M	L	L	M	M	M	H	H	L	M
CO4	L	M	L	L	L	L	H	L	H	H	L	M
CO5	L	M	M	L	L	M	M	L	L	H	L	M

Content	Hrs.
SAMPLE PROGRAM LIST Test I (HTML) 1. Experiment with Webpage creation using 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:

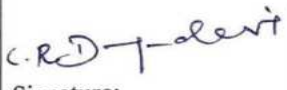
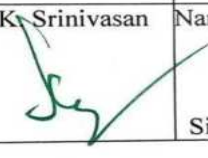
Direct Instruction, Digital Presentation

Assessment Methods:

Test, Assignments, Group Task(GD)

WEB REFERENCES:

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

Course Designed by Name and Signature	Verified by HOD Name and Signature	Checked by CDC	Approved by 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. MANICKACHEZIAN, 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
Lecture Hrs./Week	1	Tutorial Hrs./Sem.	-	Non-Major Elective - I Social Networks	Semester:	III
					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 Sharing 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

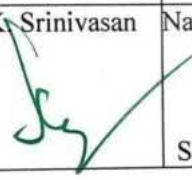
Direct Instruction, Digital Presentation, Flipped Class

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. MANICKACHEZIAN, 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: Types - Types of LAN"s – Components – Topology - Impact of LAN. N/W	3
	Total Contact Hrs.	15

Pedagogy :

Digital Presentation, Chalk and talk, Flipped class

Assessment Methods:

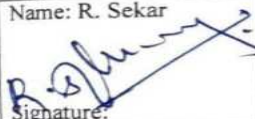
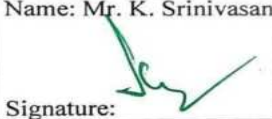
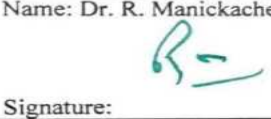
Seminar Quiz, Assignments

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
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	-	Core VIII : Data Communication and Networks	Semester:	IV
					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	Transmission Errors: Detection and Correction - Transmission Media: Guided Media, Unguided Media. Network Topologies: Mesh, Star, Tree, Ring, Bus topology. Switching- Circuit, Message, Packet switching. Routers and Routing – Factors affecting Routing Algorithms – Routing Algorithms – Approaches to Routing.	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

Reference Books

- ❖ 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 V. Prabavathi Signature:	Name: K. Vijayakumar K. Vijayakumar Signature:	Name: Mr. K. Srinivasan K. Srinivasan Signature:	Name: Dr. R. Manickachezian Dr. R. Manickachezian Signature:

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

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

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

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	JDBC: 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	JSTL 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

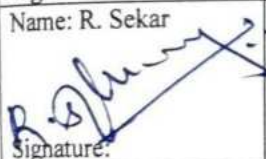
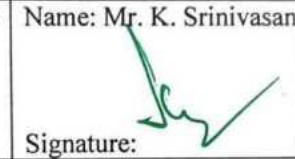
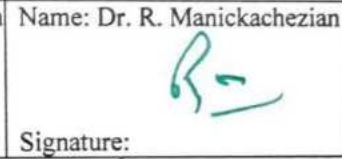
- ❖ ISRD Group, (2007), *Introduction to Object Oriented Programming through Java*, Tata McGraw-Hill Publishing Company Limited, New Delhi. (Units I, III).
- ❖ Herbert Schild, (2002), *Java Complete Reference*, 5th Edition, Tata McGraw Hill Pub (Unit II).
- ❖ S. Padma Priya, (2011), *Web Technology*, 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 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 

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
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	-	Allied IV : Software Engineering	Semester:	IV
					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

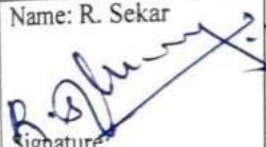
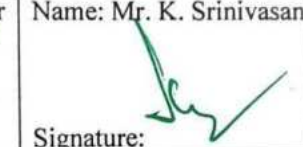
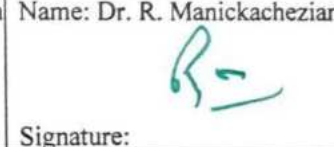
- ❖ Roger S. Pressman ,(2019), *Software Engineering-A Practitioner's Approach*, 8th Edition, McGraw-Hill International Pub.
- ❖ Jeffrey A. Hoffer, Joey F. Georgr, Joseph S. Valacich , (2000), “*Modern Systems Analysis and Design*”, 2nd Edition, Pearson Education publications. (Unit II – DFD, ER).

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. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Employability100% & Skill Development100%

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

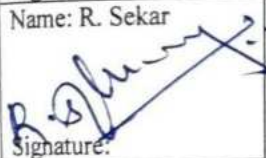
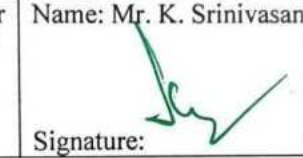
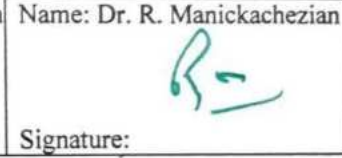
Contents	Hrs.
Test I 1. Develop JCheckBox 2. Develop a menu 3. Develop Program for swing 4. Devwlop JTabbedPane 5. Create Function of JTree 6. Create JScrollPane using swing Test II 7. Develop a Generic Servlet. 8. Implement JDBC using Servlet. 9. Develop a Javabeen to create Juggler Bean. 10. Generate simple property Javabeen	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. MANICKACHEZIAN, M.Sc. M.S. Ph.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Employability100% & Skill Development100%

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	PO9	PO10	PSO1	PSO2
CO1	L	M	M	L	L	M	M	L	L	H	L	M
CO2	L	M	L	L	L	L	H	L	H	H	L	M
CO3	L	M	M	L	L	M	M	M	H	H	L	M
CO4	L	M	L	L	L	L	H	L	H	H	L	M
CO5	L	M	M	L	L	M	M	L	L	H	L	M

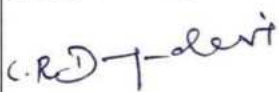
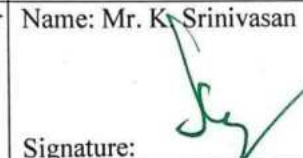
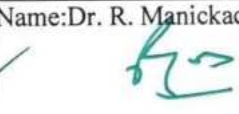
Content	Hrs.
SAMPLE PROGRAM LIST Test I 1. Inserting Basic Math And Statistics Functions 2. Using date functions 3. Logical Function- IF function 4. Look up Functions 5. Financial Functions Test II 1. Large Datasets Freezing and Printing 2. Conditional Formatting 3. Pivot Table creation with chart 4. 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	Name: K.Vijayakumar	Name: Mr. K. Srinivasan	Name: Dr. R. Manickachezian
Signature: 	Signature: 	Signature: 	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. MANICKACHEZIAN, 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

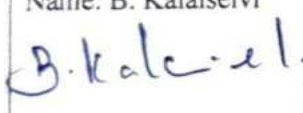
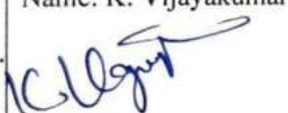
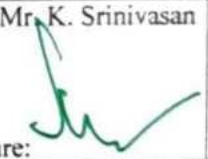
Direct Instruction, Digital Presentation

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 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	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. MANICKACHEZIAN, M.Sc., M.S. Ph.D.,
 Controller of Examinations
 NGM College (Autonomous)
 POLLACHI - 642 001.

Employability100% & Skill Development100%

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

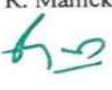
- ❖ Atul Kahate. (2009). *Cryptography and Network Security*, 2nd Edition.

Reference Books

- ❖ William Stallings. (2006). *Cryptography and Network Security Principles and Practices*. 4th Edition. PHI Education Asia.
- ❖ Behrouz A. Forouzan. (2007). *CRYPTOGRAPHY 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. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

EM – Blue SD – Green EN – Yellow

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	21UIT517	Core-XI: Information Security	6	-	-	3	50	50	100	4
	21UIT518	Core-XII: Skill Enhanced Course Open Source Methodologies	5	-	5	3	50	50	100	4
	21UIT5E1/ 21UIT5E2/ 21UIT5E3	Core Elective-I: Data Mining and Analytics/ Core Elective - I : Artificial Intelligence and Expert Systems / Core Elective-I: E-Commerce	6	-	-	3	50	50	100	4
	21UIT519	Core Lab -VII: Open Source Methodologies	-	5	-	3	50	50	100	3
	21UIT520	Core Lab -VIII: Software Testing Tools	-	4	-	3	25	25	50	3
	21UIT5AL	Advanced Learner Course- I Big Data Analytics (Optional)	SS		-	3	50	50	100	3*
	21UIT5VA	Designing and Animation	30 Hrs.			-	-	50	50	2*
IV	21UIT5S1/ 21UIT5S2	Skill Based Elective-I: Lab. Web Programming (PHP)/ Skill Based Elective-I: Lab. Web Programming (ASP.Net)	-	3	-	2	25	25	50	3
	21HEC505	Human Excellence-National Values & SKY Yoga Practice - V	1	-	-	2	25	25	50	1
CC	21CFE505	Fluency in English– V	-	-	-	-	-	-	-	-
	21CSD501	Soft Skills Development–I	-	-	-	-	-	-	-	Grade
	21GKL501	General Awareness-Self Study	SS		-	2	-	50	50	Grade

Total: 550

This Syllabus is passed under BOS April 2021 and approved by CDC

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	21UIT621	Core-XIV :Skill Enhanced Course Python Programming	5	-	-	3	50	50	100	4
	21UIT6E1/ 21UIT6E2/ 21UIT6E3	Core Elective - II : R Programming / Core Elective-II: Internet of Things/ Core Elective-II: Blockchain Technology	6	-	-	3	50	50	100	4
	21UIT6E4/ 21UIT6E5/ 21UIT6E6	Core Elective - III: Mobile Computing / Core Elective-III: Computer Graphics/ Core Elective - III : Cloud Computing	6	-	-	3	50	50	100	4
	21UIT622	Core Lab- IX: Python Programming	-	5	-	3	50	50	100	3
	21UIT623	Project	-	4	30	-	50	50	100	4
	21UIT6AL	Advanced Learner Course- IIR- Programming Lab.(Optional)	SS				50	50	100	3*
	21UIT6VA	Basics of Blockchain Technology	30 Hrs.			-	-	50	50	2*
IV	21UIT6S1/ 21UIT6S2	Skill Based Elective-II:-Lab.DTP Software (Photoshop)/ Skill Based Elective-II:-Lab.IIDTP Software (Coral Draw)	-	3	-	2	25	25	50	3
	21HEC606	Human Excellence- Global Values & SKY Yoga Practice– VI	1	-	-	2	25	25	50	1
CC	21CFE606	Fluency in English–VI	-	-	-	-	-	-	-	-
	21CSD602	Soft Skills Development–II	-	-	-	-	-	-	-	Grade
Total:									600	
Total									3900	140+10*

*Extra Credit Courses: **AL**-Advanced Learner Course(Optional) **VA**–Value Added Course. #**CC** - Certificate Courses/Co –Scholastic Courses

Grand Total=3900; Total Credits =140+10 Extra Credits

This Syllabus is passed under BOS April 2021 and approved by CDC

ProgrammeCode:	B.Sc.- IT			ProgrammeTitle:	InformationTechnology	
Course Code:	21UIT517			Title	Batch:	2021 -2024
				Information Security	Semester:	V
LectureHrs./Week	6	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

ToendowwithbetterknowledgeonvariousconceptsofSecurity,SymmetricandAsymmetric algorithms, Digital certificates, E-mail, WWW, 2G, 3G etc.

Course Outcomes

Onthesuccessful completionofthecourse, studentswill beable to

CO Number	CO Statement	Knowledge Level
CO1	ToRecollectbasicconceptsofnetworksecurity	K1
CO2	ToUnderstand basicknowledgeof cryptography	K2
CO3	To Applydiversesecurity mechanisms	K3
CO4	ToEvaluatevarious securityalgorithms	K4
CO5	ToInterpretdifferenttypesof 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 – <i>*Types of attacks.</i> 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 – <i>*Algorithm Types and modes</i> – Overview – DES – IDEA – RC4 & 5 – Blowfish – AES.	19
Unit III	Asymmetric Key Algorithms: Introduction – History – Overview – RSA algorithm – <i>*Symmetric and asymmetric cryptography.</i> Digital Signatures: Introduction – Message Digests – MD5 – Secure Hash Algorithm. Knapsack algorithm – Other algorithms.	18
Unit IV	Digital Certificates: Introduction – Concepts – <i>*Certification Authority</i> – 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)

TextBook

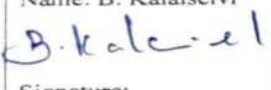
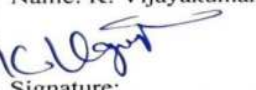
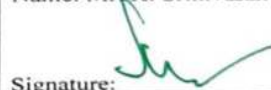
- ❖ ATULKAHATE.(2013).*CRYPTOGRAPHYandNETWORKSECURITY*.3rd Edition, McGrawHillEducationPvtLtd.

ReferenceBooks

- ❖ WilliamStallings.(2006).*CryptographyandNetworkSecurityPrinciplesandPractices*.4th Edition. PHI Education Asia.
- ❖ BehrouzA.Forouzan.(2007).*CRYPTOGRAPYandNETWORKSECURITY*.TataMcGraw Hill Pub.

WebReferences

- ❖ <https://www.youtube.com/watch?v=edQIJvaUhHg>
- ❖ <https://www.youtube.com/watch?v=9OjK9NNIXYY>
- ❖ <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 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	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. MANICKACHEZIAN, M.Sc., M.S. Ph.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

ProgrammeCode:	B.Sc.-IT		ProgrammeTitle:	InformationTechnology	
Course Code:	21UIT518		Title	Batch:	2021 -2024
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	5	SkillEnhancedCourse:	Semester:
				Open Source Methodologies	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.	15+1
Unit II	Shell Programming: Usage – Philosophy – Definition – Pipes and redirection – As a programming language – Syntax – Graphical (Dialog Utility).	14+1
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.	14+1
Unit IV	Android: Introduction – Features – AOS versions – Google play - Packages – ASDK – OOP – Test driving Tip calculator App in AVD – Build Apps – Development resources.	13+1
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.	14+1
	Total Contact Hrs.	75

Pedagogy

Digital Presentation, Chalk and talk, Flipped Class

Assessment Methods

Test, Seminar, Assignment, Group task (GD/Roleplay/abs).

TextBooks

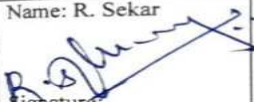
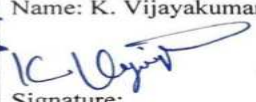
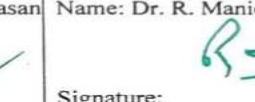
- ❖ Neil Matthew and Richard Stones, (2006), *Beginning LINUX Programming*, 3rd Edition, WileyDream Tech Publications (Units I – III).
- ❖ .PaulandHarveyDeitel,(2018),*Android6forProgrammers*,3rdEdition,PearsonEducation Publications. (Units IV & V),

ReferenceBooks

- ❖ SumithabaDas,(2006),*UnixConceptsandApplications*,Version4.
- ❖ Mark G.Sobell,(2004),*APracticalGuidetoRedHatLinux8*,PearsonEducation,Edition.
- ❖ Jang,(2003),*MasteringRedHatLinuxFedoraCore5*,WileyPub.

WebReferences

- ❖ <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 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	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.

ProgrammeCode:	B.Sc.- IT			ProgrammeTitle:	InformationTechnology	
Course Code:	21UIT5E1			Title	Batch:	2021 -2024
				MajorElective-I DataMining 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 item set 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 backpropagation -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 web-datamining 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)

TextBooks

- ❖ 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.

WebReferences

- ❖ <https://youtu.be/m5c27rQtD2E>
- ❖ <https://youtu.be/6FWIez4lP68>

Course Designed by Name and Signature	Verified by HOD Name and Signature	Checked by CDC	Approved by 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. MANICKACHEZIAN, M.Sc., M.S., Ph.D.
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

ProgrammeCode:	B.Sc.- IT			ProgrammeTitle:	InformationTechnology	
Course Code:	21UIT5E2			Title	Batch:	2021 -2024
				Major Elective – I	Semester:	V
Lecture Hrs./Week:	6	Tutorial Hrs./Sem.:	-	Artificial Intelligence &Expert Systems	Credits:	4

Course Objective

Toembedadeepknowledgeaboutsearchtechniques,reasoning,gameplaying,expert systems and prolog.

Course Outcomes

Onthesuccessful completionofthecourse, studentswill beable to

CO Number	CO Statement	Knowledge Level
CO1	ToUnderstand thenature of AIproblems and taskdomains of AI	K1
CO2	ToApplytheappropriatesearchprocedurestosolvetheproblemsby usingbest algorithms.	K3
CO3	ToAnalyze andselectthesuitableknowledge representationmethod.	K4
CO4	ToManipulatetheacquiredknowledge andinfernew knowledge.	K4
CO5	ToDemonstratethedevelopmentofAISystemsbyencodingthe 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: AI Problems – AI techniques – Criteria for success. Problems, Problem Spaces, Search: State space search – Production Systems – Problem Characteristics – Issues in design of Search.	18
Unit II	Heuristic Search techniques: Generate and Test – Hill Climbing – Best-First, Problem Reduction, Constraint Satisfaction, Means-end analysis.	18
Unit III	Knowledge representation issues: Representations and mappings – Approaches to Knowledge representations – Issues in Knowledge representations – Frame Problem.	18
Unit IV	Predicate Logic: Representing simple facts in logic – Representing Instance and Is-a relationships – Computable functions and predicates – Resolution – Natural deduction.	18
Unit V	Representing knowledge using rules: Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge Brief explanation of Expert Systems-Definition- Characteristics- architecture- Knowledge Engineering-Expert System Life Cycle-Knowledge Acquisition Strategies-Expert System Tools	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

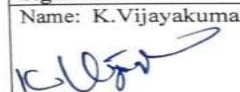
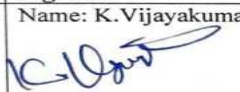
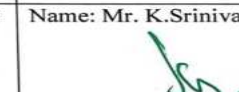
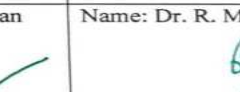
- ❖ Elaine Rich, Kevin Knight, (2009), *Artificial Intelligence*, 3rd edition, Tata McGraw Hill Publications.

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: K. Vijayakumar	Name: K. Vijayakumar	Name: Mr. K. Srinivasan	Name: Dr. R. Manickachezian
 Signature:	 Signature:	 Signature:	 Signature:
K. VIJAYAKUMAR , MCA., M. Phil., Head, Dept. of Information Technology, NGM College (Autonomous), POLLACHI - 642 001.	K. SRINIVASAN , MCA., Co-ordinator Curriculum Development Cell (CDC) NGM College (Autonomous) Pollachi - 642 001.	Dr. R. MANICKACHEZIAN , M.Sc., M.S., Ph.D., Controller of Examinations NGM College (Autonomous) POLLACHI - 642 001.	

ProgrammeCode:	B.Sc.- IT			ProgrammeTitle:	InformationTechnology		
Course Code:	21UIT5E3			Title	Batch:	2021 -2024	
LectureHrs./Week	6	Tutorial Hrs./Sem.	--	MajorElective-I: E-Commerce	Semester:	V	
					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-payments systems in current scenario	K2
CO3	To apply mobile payments.	K3
CO4	To analyze various portals associated 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 – * <i>Advantages – Disadvantages</i> – 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 – * <i>Security on the internet.</i> 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: * <i>Portals</i> – 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)

TextBook

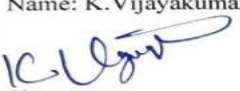
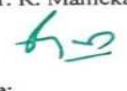
- ❖ P.T.Joseph S.J., (2017), *E-Commerce: An Indian Perspective*, 5th Edition, PHI.

ReferenceBooks

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

WebReferences

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

Course Designed by	Verified by HOD	Checked by	Approved by
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, MCA.,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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

ProgrammeCode:	B.Sc.- IT			ProgrammeTitle:	InformationTechnology	
Course Code:	21UIT519			Title	Batch:	2021 -2024
Practical Hrs./Week	5	Tutorial Hrs./Sem.	-	Lab.-VII Open Source Methodologies	Semester:	V
					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	-	-

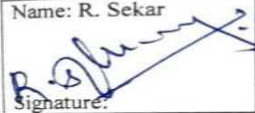
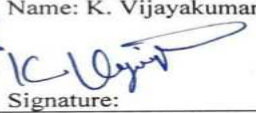
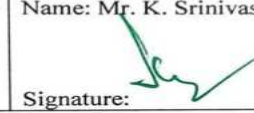
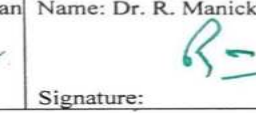
Content	Hrs.
Sample Program List Test I Using GNOME, perform the following 1. Develop the Change of the Desktop Background and mouse pointer theme. 2. Develop the Change the Root Password. 3. Create the Add/Remove software. 4. Create List and view all the files using Icon. 5. Create an Archive file and Extract all Individual files from it. 6. Develop and Perform character Mapping. Using Shell perform the following 1. Execute the File manipulation commands 2. Execute the Directory manipulation commands 3. Execute the Utility commands 4. Execute the Pipes & Filter commands Test II Using Android SDK perform the following 1. Develop the phone dialer with the given number filled in. 2. Develop a Google search using Intent. 3. Create a Sending text message and showing a picture (using extra attributes). 4. Develop the Music player and play a song stored in SD card. 5. Create a simple Android Application.	75
Total Contact Hrs.	75

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods

Test, Assignments, Group Task. (GD)

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

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

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

Dr. R. MANICKACHEZIAN, 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:	21UIT520			Title	Batch:	2021 -2024	
				Lab -VIII: Software Testing Tools	Semester:	V	
Practical Hrs./Week	4	Tutorial Hrs./Sem.	--		Credits:	3	

Course Objective

To gain the knowledge to apply the various programming concepts of Software testing like integration, unit, functional, non-functional testing and 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 application to test	K6
CO4	To develop test cases for the testing programs	K6
CO5	To test web sites 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.
SAMPLEPROGRAMLIST TestI UsingWinrunner 1. Createapayrollsystem andtest usingthe tool. 2. Createarationshopmanagementsystem andtestusingthe tool. 3. Createairlinerreservationsystem andtest usingthe tool. 4. Create Librarymanagementsystem and testusingthe tool. 5. Create Bankingsystemand testusingthe tool. TestII UsingSelenium 1. Write a simple test program that will launch Firefox browser and open “WWW.google.com”. 2. Writeasimpletestprogramthatwilllaunchgooglechromebrowserandopen “WWW.ngmc.org ” and then search Department of Information Technology . 3. WriteasimpletestprogramthatwilllaunchFirefoxbrowserandopen“WWW.gmail.com”. 4. WriteasimpletestprogramthatwilllaunchGooglechromebrowserandopen“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”andthensearchyahoomail.	60
TotalContactHrs.	60

Pedagogy

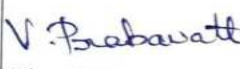
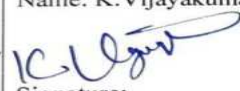
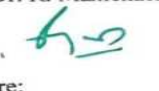
DirectInstruction,DigitalPresentation

AssessmentMethods

Test,Assignments,GroupDiscussion

Webreferences

- ❖ <https://www.educba.com/winrunner/>
- ❖ <https://www.slideshare.net/mansiraipara/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 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	Signature:

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

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

Dr. R. MANICKACHEZIAN, 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:	21UIT5AL			Title	Batch:	2021 -2024
				BigDataAnalytics	Semester:	V
Lecture Hrs./Week	SS	Tutorial Hrs./Sem.	-	(Self-Study)	Credits:	3*

Course Objective

To cultivate knowledge about Big data Analytics and Technologies and to transform the business using Analytics.

Course Outcomes

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

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

Mapping

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

Units	Content
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
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.
Unit III	Apply Analytics: Evolution of analytics – Text analytics – Speech analytics – Video/image analytics – Behavior analytics – Combined analytics – Transparency – Prediction vs. privacy
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
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

Assessment Methods:

Test, Quiz, Assignments

TextBooks

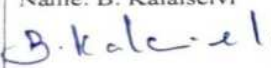
- ❖ Seema Acharya, Subashini Chellapan, (2019) “Big Data and Analytics”, 2nd Edition, Wiley Publications (Unit – I, II)
- ❖ Bernard Marr, (2015) “Big data: using smart big data, analytics and metrics to make better decisions and improve performance”, Wiley Publications (Unit – III, IV, V)

Reference Book

- ❖ M. Vijayalakshmi Radha Shankarmani (2016) “Big Data Analytics”, Kindle Edition, Wiley Publications

WebReferences

- ❖ <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 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	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. MANICKACHEZIAN, 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:	21UIT5VA			Title	Batch:	2021 -2024	
Practical Hrs./Week	2	Tutorial Hrs./Sem.	--	Designing and Animation	Semester:	V	
					Credits:	2*	

Course Objective

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

Course Outcomes

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

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

Mapping

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

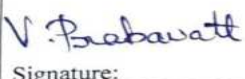
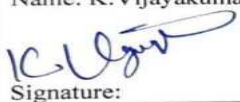
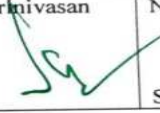
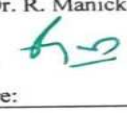
Units	Content	Hrs.
Unit I	❖ Develop a flash program to animate the Butterfly ❖ Develop a flash program to animate the Solar system ❖ Develop a flash program to animate the flag hoisting ❖ Develop a flash program to animate any game play ❖ Develop a flash program to animate traffic control	10
Unit II	❖ Create a fish aquarium ❖ Create walking with naturals ❖ Create animation using any vehicle ❖ Create a raining program effect using flash ❖ Develop an animated musical instrument play	10
Unit III	❖ Create the flight land and take off animation ❖ Create any animated cartoon character ❖ Develop animation for reading a book (flip) ❖ Create animation for the wall clock/digital clock ❖ Create banner using 2D animation	10
	Total Contact Hrs.	30

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods

Test, Assignments, Group discussion

Course Designed by	Verified by HOD	Checked by	Approved by
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, MCA,
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

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

Employability 100% & Skill Development 100%

Programme Code:	B.Sc.- IT			Programme Title:	Information Technology	
Course Code:	21UIT5S1			Title	Batch:	2021 -2024
Practical Hrs./Week	3	Tutorial Hrs./Sem.	--	Skill Based Elective-I: Lab. Web Programming (PHP)	Semester:	V
					Credits:	3

Course Objective

To know 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 website using 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.
SAMPLEPROGRAMLIST 1. ExecuteaPHP Program toprintanarray. 2. ExecuteaPHPProgramto sortelements in anarrayinascendinganddescendingorder. 3. Developa PHPprogram tosplit astringasarrayelementsbased on delimiter. 4. ExecuteaPHP Program tocombinehearrayelements intoa stringwithgiven delimiter. 5. DevelopaPHPProgramtoProgramtcreate a SimpleCalculator. 6. DevelopaPHPProgramstocreate simpleLoginand Logoutusing sessions. 7. Developa PHPProgramto uploadafiletotheServer. 8. CreateaPHPProgramtcreateaNewDatabase. 9. CreateaPHPProgram toconnecttotheserver andselectingdatabase. 10. CreateaPHPProgramtoinsert recordstothe tablein Database. 11. CreateaPHPProgramtofetch recordsfromthetablein Database. 12. CreateaPHPProgramtoStoreanimageinDatabase. 13. CreateaPHPProgramtoReadimagefromDatabase. 14. CreateaPHPProgramtcreate asimpleRegistrationform. 15. 'CreateaPHPprogramfor Contactform.	45
TotalContactHrs.	45

Pedagogy

Test,Assignments,Group Discussion

Assessment Methods

DirectInstruction,DigitalPresentation

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. MANICKACHEZIAN, 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:	21UIT5S2			Title	Batch:	2021 -2024	
Practical Hrs./Week	3	Tutorial Hrs./Sem.	--	Skill Based Elective - I: Lab. WebProgramming(ASP.Net)	Semester:	V	
					Credits:	3	

Course Objective

To know the various scripting concepts and tags in ASP.net Programming and creating webpage.

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 the different controls in asp.net.	K3
CO2	To analyze various applications in the web.	K4
CO3	To create websites with database.	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	-	-

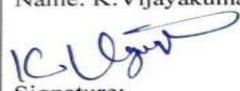
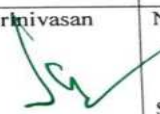
Content	Hrs.
SAMPLEPROGRAMLIST Test-1 1. Executeasimpleprogramusingwebcontrols. 2. ToworkwithstatesofASP.NetpagesandAdrotatorcontrol. 3. Toworkwithcalendarcontrol, treeview control&validation control. 4. DevelopInteractionwithauserinaformwith radiobuttons 5. ExecuteReturnsessionidnumberfor auser 6. ExecuteGetasession'stimeout Test-2 7. Executequerytextboxand displayrecords inbyusingdatabase. 8. Tomakeuseof databaseforinsertingand deleting records usingdatabase. 9. Toexecutedata gridanditscontroltemplate. 10. DevelopInteractionwithauserinaform thatusethe "post"method. 11. Createasimpleapplicationusingdatabase.	45
TotalContactHrs.	45

Pedagogy

DirectInstruction,DigitalPresentation

AssessmentMethods

Test,Assignments,GroupDiscussion

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

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

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

Dr. R. MANICKACHEZIAN, 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:	21UIT621			Title	Batch:	2021 -2024
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	-	Skill Enhanced Course: Python Programming	Semester:	VI
					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 collect 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
Unit II	Operators in python-Functions: Introduction-Need-Basics-Defining functions-Passing Variables- Function Arguments-Additional note on Modules-Special functions.	13
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
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
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
	Total Contact Hrs.	75

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods

Test, Seminar, Quiz, Assignments

TextBook

- ❖ AnuragGupta,G.P.Biswas,(2020),PythonProgramming–ProblemSolving,PackagesAnd Libraries, Mc Graw Hill Publications.

ReferenceBooks

- ❖ SheetalTanejaandNaveenKumar,(2018) “PythonprogrammingAModularApproachwith Database, Mobile, and Web Applications“ Pearson India Education Services.
- ❖ ChrisMeyersAllenDowney,JeffreyElkner.(2015).LearningwithPythonDreamTechPress, Kindle Edition.

WebReferences

- ❖ <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: V.Prabavathi V. Prabavathi Signature:	Name: K.Vijayakumar K. Vijayakumar Signature:	Name: Mr. K.Srinivasan K. Srinivasan Signature:	Name: Dr. R. Manickachezian Dr. R. Manickachezian Signature:

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

K. SRINIVASAN, MCA.,
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:	21UIT6E1			Title	Batch:	2021 -2024	
Lecture Hrs./Week	6	Tutorial Hrs./Sem.	-	Major Elective–II R Programming	Semester:	VI	
					Credits:	4	

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	Hrs.
UnitI	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.	18
UnitII	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 – passingfunctionsto and from other functions– variable scope. Strings and factors.	19
UnitIII	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.	17
UnitIV	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.	17
UnitV	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.	19
	TotalContactHrs.	90

Pedagogy

Seminar,DigitalPresentation,Chalkandtalk.

AssessmentMethods

Test,Quiz,Assignment,Grouptask.

Text Book

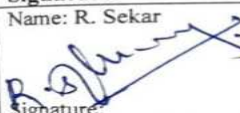
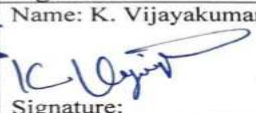
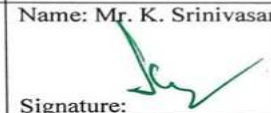
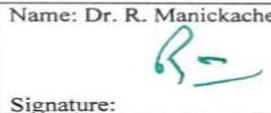
- ❖ Richard Cotton, (2019) *A step by step Function Guide to Data Analysis – Learning R*. Shroff Publishers & Distributors Pvt. Ltd. ISBN: 978-93-5110-286-1

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://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, MCA.
Co-ordinator
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

Dr. R. MANICKACHEZIAN, 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:	21UIT6E2			Title	Batch:	2021 -2024
				Major Elective II:	Semester:	VI
Lecture Hrs./Week	6	Tutorial Hrs./Sem.	-	Internet of Things (IoT)	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 – RFID 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)

TextBook

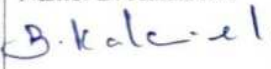
- ❖ RajKamal,(2019),*InternetofThingsArchitectureandDesignPrinciple*,4thReprint,McGrawHill Education.

ReferenceBooks

- ❖ VijayMadisetiandArshdeepBahga,(2014),*InternetofThings(AHands-on-Approach)*, 1stEdition,VPT
- ❖ Margolis,Michael(2011)ArduinoCookbook:Receipestobegin, *ExpandandEnhanceYourProjects*. O'Reilly Media Inc.
- ❖ Monk,Simon.RaspberryPi(2016)*Cookbook:SoftwareandhardwareproblemsandSolutions*. O'Reilly Media Inc.

WebReferences

- ❖ 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 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	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. MANICKACHEZIAN, 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:	21UIT6E3			Title	Batch:	2021 -2024	
Lecture Hrs/Week:	6	Tutorial Hrs./Sem.	-	Major Elective - II	Semester:	VI	
				Block Chain Technology	Credits:	4	

Course Objective

To understand the fundamentals of blockchain and cryptocurrency, influence and role of blockchain in various fields.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To keep in mind the fundamentals of blockchain technology and cryptocurrency	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 Cryptocurrencies versus Blockchain-Distributed Ledger Technology (DLT). Strategic analysis of the space – Blockchain platforms, regulators, application providers. The major application: currency, identity, chain of custody.	18
Unit II	Network and Security: Advantage over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Blockchain 1.0, 2.0 and 3.0 – transition, advancements and features. Privacy, Security issues in Blockchain.	19
Unit III	Cryptocurrency: Cryptocurrency-History, Distributed Ledger, Bitcoin protocols -Symmetric-key cryptography-Public-key cryptography-Digital Signatures-High and Low trust societies-Types of Trust model: Peer-to-Peer, Leviathan, and Intermediary. Application of Cryptography to Blockchain.	18
Unit IV	Cryptocurrency Regulation: Cryptocurrency Regulation - Stakeholders, Roots of Bit coin, Legal views - exchange of cryptocurrency - Black Market - Global Economy. Crypto-economics – assets, supply and demand, inflation and deflation – Regulation.	18
Unit V	Challenges in Block Chain: Opportunities and challenges in Block Chain – Application of block chain: Industry 4.0 – machine to machine communication – Data management in industry 4.0 – future prospects. Block chain in Health 4.0 - Blockchain properties-Healthcare Costs-Healthcare Quality-Healthcare Value -Challenges for using 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

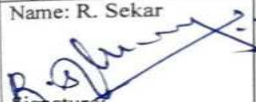
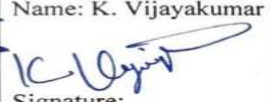
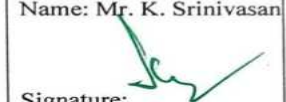
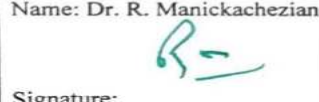
- ❖ Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, (2016), “*Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction*”, Princeton University Press.
- ❖ Antonopoulos, “*Mastering Bitcoin: Unlocking Digital Cryptocurrencies*” (2014), 1st Edition, O'Reilly Media.

Reference Books

- ❖ Satoshi Nakamoto, “*Bitcoin: A Peer-to-Peer Electronic Cash System*” (2008), SSRN Electronic Journal.
- ❖ Rodrigoda Rosa Righi, Antonio Marcos Alberti, Madhusudan Singh, (2020), “*Blockchain Technology for Industry 4.0*”, Springer.

Web References

- ❖ <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.

Employability 100% & Entrepreneurship 100%

Programme Code:	B.Sc.- IT			Programme Title:	Information Technology	
Course Code:	21UIT6E4			Title:	Batch:	2021 -2024
Lecture Hrs./Week:	6	Tutorial Hrs./Sem.	-	Major Elective–III Mobile Computing	Semester:	VI
					Credits:	4

Course Objective

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 network 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– VoiceXML–TAPI. EMERGING TECHNOLOGIES: BlueTooth–RFID–WiMAX–MobileIP– IPv6–JavaCard.	17
Unit III	GSM: Global Systemformobilecommunications –GSMArchitecture –GSMEntities – 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 – Useragent & 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
	TotalContactHrs.	90

Pedagogy

DirectInstruction,DigitalPresentation,FlippedClass

AssessmentMethods

Test,Seminar,Quiz,Assignments,GroupTask.(GD/RollPlay/APS)

TextBook

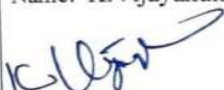
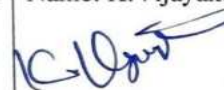
- ❖ AsokeKTalukder, RoopaR Yavagal.(2005),*Mobile Computing*, TMH.

Reference Books

- ❖ JochenSchiller,(2008),*Mobile Communication*,SecondEdition,PearsonEducationAsia.
- ❖ Christoffer Andersson (2001), *GPRS and 3G Wireless Applications*, John Wiley and son'spub.

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,Dep. 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.

ProgrammeCode:	B.Sc.- IT			ProgrammeTitle:	Bachelor of Information Technology	
Course Code:	21UIT6E5			Title	Batch:	2021 -2024
				Major Elective-III Computer Graphics	Semester:	VI
LectureHrs./Week	6	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

To offer programming ability on graphics, clear view on graphics functions, output devices, 3D and 2D transformations etc.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To remember basic graphic systems	K1
CO2	To understand various graphical algorithms	K2
CO3	To implement two, three dimensional and clipping algorithms	K3
CO4	To sort of visible surface detection methods	K4
CO5	To influence color modeling in graphics 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	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	Overview of Graphics Systems: Video Display Devices, Refresh Cathode ray tubes, Raster Scan displays, Random Scan Displays, Color CRT monitors, Direct view storage tubes, Flat panel Displays, 3-Dimensional viewing devices, Stereoscopic and Virtual Reality systems, Raster Scan Systems, Random Scan Systems-, Input Devices, Graphics software.	18
Unit II	Output Primitives: Points and Lines – Line-Drawing algorithms – Loading frame Buffer – Line function – Circle-Generating algorithms. Attributes of Output Primitives: Line Attributes – Curve attributes – Color and Grayscale Levels – Area-fill attributes – Character Attributes.	18
Unit III	2D Geometric Transformations: Basic Transformations – Matrix Representations – Composite Transformations – Other Transformations. 2D Viewing: The Viewing Pipeline – Viewing Co-ordinate Reference Frame – Window-to-Viewport Co-ordinate Transformation – 2D Viewing Functions – Clipping Operations – Point, Line: Cohen-Sutherland Line Clipping, Liang-Barsky Line Clipping, Polygon, Curve, Text and Exterior clippings.	18
Unit IV	3D Concepts: 3D Display Methods – 3D Graphics Packages. 3D Object Representations: Polygon Surfaces – Curved lines and Surfaces – Blobby Objects. 3D Geometric Modeling and Transformations: Translation – Rotation – Scaling – Other Transformations.	16
Unit V	Visible-Surface Detection Methods: Classification of Visible-Surface algorithms – Depth-Buffer Method – Scan-Line Method – Depth-Sorting Method – BSP-Tree Method – Area-Subdivision Method – Octree Methods – Ray-casting Methods – Curved surfaces – Wire frame Methods – Visibility-Detection functions. Illumination Models: Standard Primaries and the Chromaticity Diagram – Intuitive color Concepts – RGB Color Model – YIQ Color Model – CMY Color Model – HLS Color Model – Color selection and Applications.	20
	Total Contact Hrs.	90

Pedagogy

Direct Instruction, Digital Presentation, Flipped Class

Assessment Methods

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

TextBook

- ❖ Donald Hearn, Pauline Baker, Warren Carithers (2016). *COMPUTER GRAPHICS*. 4th Edition. Pearson Education, Indian reprint.

ReferenceBooks

- ❖ William M. Newman & Robert F. Sproull. (2007). *PRINCIPLES OF INTERACTIVE COMPUTER GRAPHICS*. TMH.
- ❖ Malay K. Pakhira (2008), *COMPUTER GRAPHICS, MULTIMEDIA AND ANIMATION*, New Delhi, Prentice Hall of India Pvt. Ltd.

WebReferences

- ❖ https://www.tutorialspoint.com/computer_graphics/2d_transformation.htm
- ❖ <https://www.javatpoint.com/computer-graphics-3d-transformations>
- ❖ <https://www.youtube.com/watch?v=TYqzwU8pW7s>

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: B. Kalaiselvi 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	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. MANICKACHEZIAN, M.Sc., M.S. PH.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

ProgrammeCode:	B.Sc.- IT			ProgrammeTitle:	InformationTechnology	
Course Code:	21UIT6E6			Title	Batch:	2021 -2024
LectureHrs./Week	6	Tutorial Hrs./Sem.	-	MajorElective–III Cloud Computing	Semester:	VI
					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 collect 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 – SoftwaredefinedNetworking–Network functionvirtualization–MapReduce–Identity andaccessmanagement–Servicelevelagreements–Billing.	18
Unit II	Cloud services and Platforms: Compute – Storage – Database – Application – Content Delivery – analytics – Deployment and Management – Identity and access Management– OpensourcePrivateCloudSoftware. HadoopandMapReduce: ApacheHadoop– MapReduceJobexecution–Schedulers–Clustersetup.	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 PerformanceMetrics–DesignConsiderations–BenchmarkingTools–Deployment prototyping–LoadTestingandBottleneckDeduction–Hadoop Benchmarking.	17
Unit IV	Cloud Security: Introduction – CSA Cloud Security Architecture – Authentication – Authorization – Identity and Access Management – Data Security – Key Management – Auditing. CloudForIndustry,HealthCareandEducation: HealthCare–Energy systems–Transportationsystems–ManufacturingIndustry–Education.	19
Unit V	Python Basics: Introduction – Installation – Data types and Data structures –Control flow – Functions – Modules – Packages – File handling – Date/Time – Operations – Classes. Pythonfor Cloud: Amazon web services – Google Platform – Windows Azure –MapReduce–Packages–WebApplicationFramework–DesigningaRESTfulWeb API.	19
	TotalContactHrs.	90

Pedagogy

DirectInstruction,DigitalPresentation,FlippedClass

AssessmentMethods

Test,Seminar,Quiz,Assignments,GroupTask.(RollPlay)

TextBook

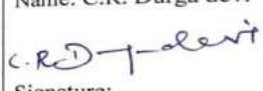
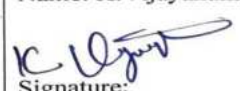
- ❖ ArshdeepBahga,VijayMadiseti.(2016).CloudComputing–AHands-onApproach. Universities Press Pvt. Ltd.

ReferenceBooks

- ❖ AnthonyT.Velte,TobyJ.Velte,Robert Elsenpeter.(2013).CloudComputing-APractical Approach. McGraw Hill Publications. Fourteenth reprint.
- ❖ Michael Miller. (2009). Cloud Computing: Web-Based Applications That Change the Way YouWork and Collaborate Online, Que Publishing.

WebReferences

- ❖ <https://www.youtube.com/watch?v=RziNWUIBPPM>
- ❖ <https://www.youtube.com/watch?v=rjY59WLMK2o>

Course Designed by Name and Signature	Verified by HOD Name and Signature	Checked by CDC	Approved by 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:	21UIT622			Title	Batch:	2021 -2024	
Practical Hrs./Week	5	Tutorial Hrs./Sem.	-	Lab.IX–Python Programming	Semester:	VI	
					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 Number	CO Statement	Knowledge Level
CO1	To deploy the list and tuple using control structures	K3
CO2	To examine need of files and its related functions	K4
CO3	To choose various packages suitable for the application	K5
CO4	To verify the usage of various in-built functions and packages	K5
CO5	To create an application using python as a developing tool	K6

Mapping

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

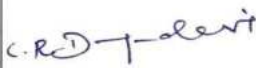
Content	Hrs.
SAMPLEPROGRAMLIST 1. Develop a program to read a number and print an inverted star pattern of the desired size. 2. Develop a program to search the number of times a particular number occurs in a list. 3. Develop a program to read a list of words and return the length of the longest one 4. 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 append it into a file.	75
Total Contact Hrs.	75

Pedagogy

Direct Instruction, Digital Presentation

Assessment Methods

Test, Assignments, Group Task (GD)

Course Designed by Name and Signature	Verified by HOD Name and Signature	Checked by CDC	Approved by 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. MANICKACHEZIAN, M.Sc., M.S., Ph.D.
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Employability100%,SkillDevelopment100%Entrepreneurship100%

Programme Code:	B.Sc.- IT			Programme Title:	Information Technology	
Course Code:	21UIT623			Title	Batch:	2021 -2024
Practical Hrs./Week:	4	Tutorial Hrs./Sem.	30	Project	Semester:	VI
					Credits:	4

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/Software through the stakeholder	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 and VIVA VOCE

Guidelines

Introduction

The title of the project work and the organization will be finalized at the end of 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 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, Tableau etc..
- System Software
- Web Security Projects
- Image Processing

Methodology

Arrangement of Contents:

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

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

Format of Table of Contents

TABLE OF CONTENTS

Chapter No.	Title	Page No.
i	Certificates	
ii	Declaration	
iii	Acknowledgement	
iv	Synopsis	
1.	Introduction	
	Introduction	
	Objective of the Project	
	Company Profile	
	System Specification	
	Hardware Specification	
	Software Specification	
2	System Study	
	Existing System	
	2.1.2 Drawbacks	

3	System Design Proposed System Planning and Scheduling Overview of the Project Modules of the Project Input Design Format Output Design Table Design Supporting Diagrams (ER/DFD/Use Case)
4	Implementation and Testing Coding Methods Testing Approach Implementation and Maintenance
5	Project Evaluation Project Outcome Limitation of the Project Further Scope of the Project
6	Conclusion
7	Appendix Source Code Screenshots and Reports
8	References

Size of the Project

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

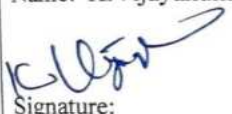
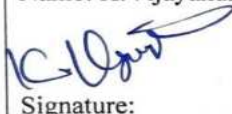
Content	Hrs. P+T
Using only the following Elective Tools Frontend, Multimedia & Web based tools: 1. Java & Advanced Java 2. Angular & Javascript 3. PHP 4. Python 5. C#.NET & VB.NET 6. HTML5.0 7. Flash 8. R-Programming Backend tools: 1. MySQL 2. Oracle 8i & above 3. MS Access 2007 4. SQL Server 2000 and 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 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	Signature:

K. VIJAYAKUMAR, MCA., M. Phil.,
Head, Dep. 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. MANICKACHEZIAN, M.Sc., M.S., Ph.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Employability100% & SkillDevelopment100%

ProgrammeCode:	B.Sc.- IT			ProgrammeTitle:	InformationTechnology		
Course Code:	21UIT6AL			Title	Batch:	2021 -2024	
PracticalHrs./Week	Self-Study	Tutorial Hrs./Sem.	-	RProgrammingLab.	Semester:	VI	
					Credits:	3*	

Course Objective

To apply various concepts of R language.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
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

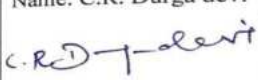
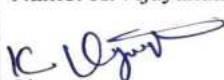
1. Develop a Program to print the numbers from 1 to 30 and print "Fizz" for multiples of 3, print "Buzz" for multiples of 5, and print "FizzBuzz" for multiples of both.
2. Develop a Program to get all prime numbers upto a given number
3. Develop a Program to find the maximum and the minimum value of 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 dataframe
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 Name and Signature	Verified by HOD Name and Signature	Checked by CDC	Approved by 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.

ProgrammeCode:	B.Sc.IT		ProgrammeTitle:	InformationTechnology	
Course Code:	21UIT6VA		Title	Batch:	2021-2024
LectureHrs./Week	Tutorial Hrs./Sem.	-	Basics of BlockChain Technology	Semester:	VI
				Credits:	2*

Course Objective

On successful completion of this subject the students can understand various concepts of Block chain, Crypto currency, Digital Signature, Bitcoins 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 block chain technology and crypto currency.	K1
CO2	To understand the mining mechanism in block chain.	K2
CO3	To apply and identify security measures, and various types of services that allow people to trade and transact with bitcoin.	K3
CO4	To analyze security, privacy, and efficiency of a given Blockchain system.	K4
CO5	To assess the concepts of Blockchain, Cryptocurrency, Bitcoin and Digital Signature.	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	M	H	M	H	H	M	M	M	H	M	M	M

Units	Content	Hrs.
Unit I	Block Chain – Introduction – Problems with centralized System – Overview – Fundamentals. Bitcoin- Introduction – Transaction life cycle - Block chain 2.0 – Smart Contracts. Block in Block chain Architecture - Distributed Consensus - Economics behind Block Chain Consensus.	10
Unit II	The Chain and the Longest chain – Cryptocurrency to Block chain 2.0 – Permissioned model of Blockchain. Cryptographic hash function – Properties – Hash pointer and Merkle tree.	8
Unit III	Digital Signature - Public Key Cryptography - A basic cryptocurrency - Creation of coins - Payments and double spending - FORTH – the precursor for Bitcoin scripting - Bitcoin Scripts - Bitcoin P2P Network - Transaction in Bitcoin Network - Block Mining - Block propagation and block relay - Why Consensus - Distributed consensus in open environments - Consensus in a Bitcoin network.	12
	Total Contact Hrs.	30

Pedagogy

Digital Presentation, Chalk and talk, Flipped class.

Assessment Methods

Seminar, Quiz, Assignments.

Text Books

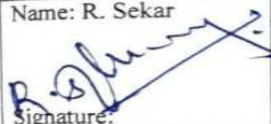
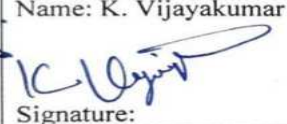
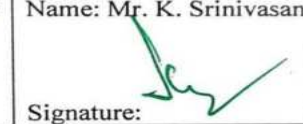
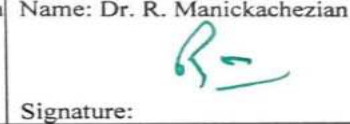
- ❖ Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, (2016), *“Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction”*, Princeton University Press.
- ❖ Antonopoulos, (2014), *“Mastering Bitcoin: Unlocking Digital Cryptocurrencies”*, O'Reilly Media Inc.

Reference Books

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

Web References

- ❖ <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 	Name: K. Vijayakumar 	Name: Mr. K. Srinivasan 	Name: Dr. R. Manickachezian 
Signature:	Signature:	Signature:	Signature:

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

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

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

Employability100%,SkillDevelopment100%

ProgrammeCode:	B.Sc.- IT			ProgrammeTitle:	InformationTechnology		
Course Code:	21UIT6S1			Title	Batch:	2021 -2024	
PracticalHrs./Week	3	Tutorial Hrs./Sem.	-	SkillBasedElective II - Lab. DTP software (Photoshop)	Semester:	VI	
					Credits:	3	

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	-	-

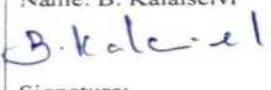
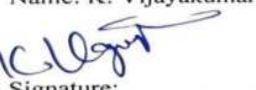
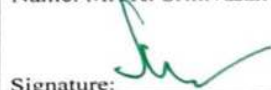
Content	Hrs.
SAMPLEPROGRAMLIST 1. Perform Scanning and simple image editing. 2. Apply Color change, image extraction and merging of images. 3. Create Smoothing of sharp edges. 4. Draw and Paint with Colors. 5. Placing a Photo inside Text. 6. Remove red eyes from a photo. 7. Apply Filters and layers. 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. MANICKACHEZIAN, M.Sc., M.S.P.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Employability 100 %, Skill Development 100 %

Programme Code:	B.Sc.- IT			Programme Title:	Information Technology	
Course Code:	21UIT6S2			Title	Batch:	2021 -2024
				Skill Based Elective II. -Lab.DTP Software (CorelDraw)	Semester:	VI
Practical Hrs./Week	3	Tutorial Hrs./Sem.	-		Credits:	3

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

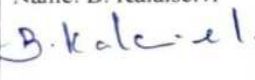
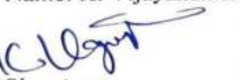
Mapping

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.
SAMPLEPROGRAMLIST 1. Drawthe Basic geometricshapesusingtools. 2. Drawdifferenttypeoflinesusinglinetools. 3. Createanimageand manipulateit. 4. PerformImageextractionandmergingofimages 5. AnimatetextusingTexttool. 6. CreateatabletheninsertData andhighlight it. 7. Createimage andinsertTexton image. 8. Drawsunflower andapplyeditingtools. 9. PerformimageFilteroperations. 10. Creatinglayer andmodifylayer properties.	30
TotalContactHrs.	30

WebReferences

- ❖ <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: 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. MANICKACHEZIAN, M.Sc., M.S. Ph.D.,
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

PRINCIPAL

Dr. R. MUTHUKUMARAN,
M.A., M.Phil., B.Ed., Ph.D.,
PRINCIPAL
N.G.M. College, Pollachi - 642 001
Coimbatore District

This Syllabus is passed under BOS April 2021 and approved by CDC