72	B.Sc.IT	Data Analytics	19UIT4N3	2019
73	B.Sc.IT	Skill Based Major Elective - Lab. I Web Programming (Python)	19UIT5S1	2019
74	B.Sc.IT	Skill Based Major Elective - Lab. II DTP Software (CorelDraw / Photoshop)	19UIT6S3/ 19UIT6S4	2019
75	B.Sc. CT	CORE VII: OPERATING SYSTEMS	19UCT309	2019
76	B.Sc. CT	CORE XIII: FRAMEWORK TECHNOLOGY	19UCT621	2019
77	B.Sc. CT	ALLIED IV: PROCESSORS	19UCT4A4	2019
78	BCA	Mathematics-II: Mathematical Foundation of Computer Applications	19UBC2A2	2019
79	BCA	Web Development	19UBC413	2019
80	BCA	Web Development Lab	19UBC416	2019
81	BCA	Storage Management	19UBC5E3	2019
82	BCA	Distributed Operating System	19UBC5S3	2019
83	BCA	Python Programming	19UBC623	2019
84	BCA	Python Programming Lab	19UBC626	2019
85	B.Com	Entrepreneurial Development	19UCO519	2019
86	B.Com	Service Markrting and Customer Relationship Marketing	19UCO625	2019
87	B.Com	Retail Management	19UCO515	2019
88	B.Com	Goods and Service Tax (GST) Accounting	19UCO518	2019
89	B.Com	Intellectual Property Rights	19UCO5S1	2019
90	B.Com	Commerce For Competitive Exams/ Business Ethics	19UCO6S3	2019
91	B.Com	Financial Management	19UCO624	2019
92	B.Com (CA)	Banking and Insurance Law	19UCC6E3	2019
93	B.Com (CA)	Services Marketing	19UCC6E4	2019
94	B.Com (CA)	Higher Corporate Accounting	19UCC410	2019
95	B.Com (CA)	Commerce and Computer Application Practical	19UCC5E1	2019
96	B.Com (CA)	Consumer Behaviour	19UCC5E2	2019

BOS HIGHLIGHTED

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE POLLACHI

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

Board of Studies -

Sl No	Members	Signature
1.	Dr. K. Haridas (CHAIRMAN) Head of the Department.	
2.	Dr. E. Karthikeyan Head & Assistant Professor Department of Computer Science Bharathiar University [Udumalpet Govt. Arts] Coimbatore – 641 046 (University Nominee)	— Absent —
3.	Dr. Britto Ramesh Kumar Asst. Professor in Comp. Science St. Joseph's College Trichy – 620 002 (Subject Expert)	16/2/19
4.	Mr. Karthick Murugesan Technical Architect & Co-Founder Texclan Software Solutions Chennai. (Industrial Expert)	
5.	Mr. M. Ugeshwaran Technical Lead Wipro Pvt. Ltd Bangalore. (Student Alumni)	— Absent —

16.02.2019

Minutes

* Mathematics concepts should be correlated with Programming Skill
* In Mathematics papers, Case studies should be added in Unit I
* Only two students per Project should be allotted (Mini-Proje
* In Semester II, Marketing and HR Management is removed and Mathematics - I paper is added
* Data Structures ..... is Preponed to Semester - III
* In Semester III, Organizational Behaviour is included instead of Data Structures and Algorithms
* In Semester IV, Instead of Framework Technologies, Web Development is replaced.
* In Semester IV, Web Development Lab and Scripting & Html Lab is introduced.
* In Semester V, Storage Management paper is introduced in Elective II.
* Computer System Architecture paper is postponed to Semester IV.
* In Semester V Skill Based Elective, Aptitude is replaced by Distributed Operating System.
* In Semester VI, Instead of Advanced Java Programming Theory and Lab, Python programming Theory and Lab is replaced.

Board of Studies -

Sl No	Members	Signature
6.	Dr. S. Hemalatha	
7.	Ms. T. Umamaheswari	
8.	Dr. R. Malathi Ravindran	
9.	Ms. N. Shyamala	
10.	Mr. S. Dilipkumar	
11.	Ms. N. Divya	
12.	Ms. A. Vanitha	
13.	Ms. R. Arthi	
14.	Mr. D. Poobathy	

16.02.2019

Minutes

* In Semester V, Files Concept is deleted from Java Programming. Swing and Servelets is included in Java Programming.

1. [signature]
2. — Absent —
3. [signature] 16/2/19
4. [signature]
5. — Absent —
6. S. H [signature]
7. Amanulla. J
8. [signature].
9. N. Shy [signature]
10. S. [signature]
11. N. [signature]
12. A.V [signature]
13. [signature]
14. R. D

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE

(AUTONOMOUS)

U.G DEPARTMENT OF COMPUTER APPLICATIONS

UNDER CBCS PATTERN GUIDED BY UNIVERSITY AND TANSCHE

(FOR THOSE WHO ADMITTED FROM THE ACADEMIC YEAR 2019-2022 BATCH AND ONWARDS)

Part	Subject Code	Subject	Ins.Hours Per Week	Exam				Credit
				Hours	CIA	ESE	Total	
SEMESTER I								
I	19 UTL 101	TAMIL - I	6	3	25	75	100	3
	19 UHN 101	HINDI - I						
II	19 UEN 101	ENGLISH - I	6	3	25	75	100	3
III	19 UBC 101	CORE I: PROGRAMMING IN C	4	3	25	75	100	4
	19 UBC 102	CORE II: FUNDAMENTALS OF DIGITAL COMPUTER	4	3	25	75	100	4
	19 UBC 1A1	ALLIED I: MATHEMATICS I - COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS	4	3	25	75	100	4
	19 UBC 103	LAB - I :PROGRAMMING IN C	4	3	20	30	50	2
IV	19 UHR 101	HUMAN RIGHTS	1	2	-	50	50	2
	19 HEC 101	HUMAN EXCELLENCE-PERSONAL VALUES & SKY YOGA PRACTICE-I	1	2	25	25	50	1
V	Extension Acticity - List Attached - Annexure I		-					
TOTAL			30	-	170	480	650	23
SEMESTER II								
I	19 UTL 202	TAMIL - II	6	3	25	75	100	3
	19 UHN 202	HINDI - II						
II	19 UEN 202	ENGLISH - II	5	3	25	75	100	3
III	19 UBC 204	CORE III: OBJECT ORIENTED PROGRAMMING WITH 'C++'	4	3	25	75	100	4
	19 UBC 205	CORE IV: DATA STRUCTURES	4	3	25	75	100	4
	19 UBC 2A2	ALLIED II: MATHEMATICS II - MATHEMATICAL FOUNDATION OF COMPUTER APPLICATIONS	4	3	25	75	100	4
	19 UBC 206	LAB - II : PROGRAMMING IN C++	4	3	20	30	50	2
IV	19 EVS 201	ENVIRONMENTAL STUDIES	2	2	-	50	50	2
	19 HEC 202	HUMAN EXCELLENCE - FAMILY VALUES & SKY YOGA PRACTICE - II	1	2	25	25	50	1
V	Extension Acticity - List Attached - Annexure I		-					
TOTAL			30	-	170	480	650	23

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE POLLACHI

Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D.
PRINCIPAL i/c
Nallamuthu Gounder Mahalingam College
Pollachi - 642 001, Coimbatore District.

Part	Subject Code	Subject	Ins.Hours Per Week	Exam				Credit
				Hours	CIA	ESE	Total	
		SEMESTER III						
III	19 UBC 307	CORE V: RDBMS AND VISUAL PROGRAMMING	5	3	25	75	100	4
	19 UBC 308	CORE VI: OPERATING SYSTEMS	5	3	25	75	100	4
	19 UBC 309	CORE VII: ORGANIZATIONAL BEHAVIOUR	4	3	25	75	100	3
	19 UBC 3A3	ALLIED III: ACCOUNTANCY FOR DECISION MAKING	5	3	25	75	100	4
	19 UBC 310	LAB - III :RDBMS AND VISUAL PROGRAMMING	4	3	20	30	50	2
	19 UBC 311	LAB - IV: OS COMMANDS AND SHELL SCRIPT PROGRAMMING	4	3	20	30	50	2
	19 UBC 312	LAB - V: DTP PROGRAMMING	1	2	20	30	50	1
IV	19 HEC 303	HUMAN EXCELLENCE - PROFESSIONAL VALUES & SKY YOGA PRACTICE - III	1	2	25	25	50	1
	19 UBC 3N1/ 19 UBC 3N2	NON- MAJOR ELECTIVE I - WEB DESIGNING LAB / DTP PROGRAMMING LAB	1	2	-	50	50	2
V	Extension Acticity - List Attached - Annexure I		-					
	TOTAL		30	-	185	465	650	23
		SEMESTER IV						
III	19 UBC 413	CORE VIII: WEB DEVELOPMENT	5	3	25	75	100	4
	19 UBC 414	CORE IX: COMPUTER SYSTEM ARCHITECTURE	5	3	25	75	100	4
	19 UBC 415	CORE X: SOFTWARE ENGINEERING	4	3	25	75	100	3
	19 UBC 4A4	ALLIED IV: MATHEMATICS III - COMPUTER BASED OPTIMIZATION TECHNIQUES	5	3	25	75	100	4
	19 UBC 416	LAB - VI: WEB DEVELOPMENT	4	3	20	30	50	2
	19 UBC 417	LAB - VII: PHP PROGRAMMING	4	3	20	30	50	2
	19 UBC 418	LAB - VIII: SCRIPTING & HTML	1	2	20	30	50	1
IV	19 HEC 404	HUMAN EXCELLENCE - SOCIAL VALUES & SKY YOGA PRACTICE - IV	1	2	25	25	50	1
	19 UBC 4N3/ 19 UBC 4N4	NON-MAJOR ELECTIVE II - OPEN SOURCE SOFTWARE LAB / 2-D ANIMATION LAB	1	2	-	50	50	2
V	Extension Acticity - List Attached - Annexure I		-	-	-	50	50	1
	TOTAL		30	-	185	515	700	24

MALLAMUTHU GOUNDER POLLACHI MAHALINGAM COLLEGE

Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D.,
PRINCIPAL i/c
Mallamuthu Gounder Mahalingam College
Pollachi - 642 001, Coimbatore District.

Part	Subject Code	Subject	Ins.Hours Per Week	Exam				Credit
				Hours	CIA	ESE	Total	
SEMESTER V								
III	19 UBC 519	CORE XI: JAVA PROGRAMMING	4	3	25	75	100	3
	19 UBC 520	CORE XII: SOFTWARE TESTING	4	3	25	75	100	3
	19 UBC 5E1/ 19 UBC 5E2	ELECTIVE I	5	3	25	75	100	5
	19 UBC 5E3/ 19 UBC 5E4	ELECTIVE II STORAGE MANAGEMENT	5	3	25	75	100	5
	19 UBC 521	LAB -IX: JAVA PROGRAMMING LAB	5	3	20	30	50	2
	19 UBC 522	LAB - X: SOFTWARE TESTING LAB	5	3	20	30	50	2
IV	19 HEC 505	HUMAN EXCELLENCE - NATIONAL VALUES & SKY YOGA PRACTICE - V	1	2	25	25	50	1
	19 GKL 501	GENERAL KNOWLEDGE AND GENERAL AWARENESS	SS	2	-	50	50	2
	19 UBC 5S1/ 19 UBC 5S2/ 19 UBC 5S3	SKILL BASED MAJOR ELECTIVE I : SOFTWARE ANALYSIS AND DESIGN / E-COMMERCE / DISTRIBUTED OPERATING SYSTEM	1	2	-	50	50	2
TOTAL			30	-	165	485	650	25
SEMESTER VI								
III	19 UBC 623	CORE XIII: PYTHON PROGRAMMING	5	3	25	75	100	4
	19 UBC 624	CORE XIV: INFORMATION SECURITY	4	3	25	75	100	3
	19 UBC 625	CORE XV: MOBILE APPLICATION DEVELOPMENT	4	3	25	75	100	3
	19 UBC 6E5/ 19 UBC 6E6	ELECTIVE-III	5	3	25	75	100	5
	19 UBC 626	LAB -XI: PYTHON PROGRAMMING LAB	5	3	20	30	50	2
	19 UBC 627	LAB - XII: MOBILE APPLICATION DEVELOPMENT LAB	5	3	20	30	50	2
IV	19 HEC 606	HUMAN EXCELLENCE - GLOBAL VALUES & SKY YOGA PRACTICE - VI	1	2	25	25	50	1
	19 UBC 6S4/ 19 UBC 6S5/ 19 UBC 6S6	SKILL BASED MAJOR ELECTIVE II : SOFTWARE INDUSTRY DOMAINS / MULTIMEDIA AND ANIMATION / SOFT SKILLS	1	2	-	50	50	2
TOTAL			30	-	165	435	600	22
TOTAL			180	-	1040	2860	3900	140

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE POLLACHI

Dr. R. MANICKA CHEZIAN M.Sc.,M.S.,Ph.D.,
PRINCIPAL i/c
Nallamuthu Gounder Mahalingam College
Pollachi - 642 001, Coimbatore District.

ADD-ON COURSE: Mini Project	-		-	20	80	100	2

*Note: List of Part - V subjects attached

LIST OF MAJOR ELECTIVE PAPERS

ELECTIVE -I	**19 UBC 5E1 - NETWORKS**
	19 UBC 5E2 - GRID COMPUTING
ELECTIVE -II	**19 UBC 5E3 - STORAGE MANAGEMENT**
	19 UBC 5E4 - CURRENT TRENDS AND TECHNOLOGIES
ELECTIVE - III	**19 UBC 6E5 - DATA MINING AND WAREHOUSING**
	19 UBC 6E6 - CLOUD COMPUTING

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE POLLACHI

Dr.R.MANICKA CHEZIAN M.Sc.,M.S.,Ph.D.
PRINCIPAL i/c
Nallamuthu Gounder Mahalingam College
Pollachi - 642 001, Coimbatore District.

HOD	CDC	COE
Dr.K.Haridas	Dr. M. Durairaju	Dr. R. Muthukumaran

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	19 UBC 2A2	Title	Batch:	2019-2022
Hrs/Week:	4	MATHEMATICS – II: MATHEMATICAL FOUNDATION OF COMPUTER APPLICATIONS	Semester	II
			Credits	04

Course Objective

To recollect the samples accuracy, locate and use good mathematical software.
To understand the number representation errors and convergence properties.
To apply numerical methods as the basis of procedural language such as C, C++and JAVA.
To analyze the influence of data representation and computer architecture on algorithm choice and development.

Course Outcomes (CO)

K1	CO1	Be able to construct simple mathematical proofs and possess the ability to verify them.
K2	CO2	Acquire ability to describe computer programs in a formal mathematical manner.
K3	CO3	To prove simple mathematical properties of a variety of discrete structures.
K4	CO4	Be able to specify and manipulate basic mathematical objects such as Sets, functions, and relations and will also be able to verify simple mathematical properties.

Units	Content	Hrs
Unit I	**Set Theory:** Introduction - SET - Finite Set-Cardinality - SubSet-Equal Sets - Null Set (or) Empty Set- Singleton Set - Universal Set – Union – Intersection - Disjoint Sets - Difference Set - Complement Set - Power Set - Principle of Inclusion and Exclusion - Ordered Pair - Cartesian Products - Partition of Set - Min Sets - Max Set.	10
Unit II	**Functions:** Introduction - Types of Functions - Classification of functions - Algebraic function - Transcendental function - Composition of functions - Identity function - Inverse of a function - Characteristic function of a Set -Hashing functions. **Relations:** Binary Relation - Complementary Relation - Inverse Relation-Union and Intersection of two relations - Symmetric	9

	Relation - Anti-Symmetric Relation - Reflexive Relation - Transitive Relation-Equivalence Relation.	
Unit III	**Graph Theory:** Graph: Undirected Graph - Directed Graph - Multi Graph - Vertex : Finite Pseudo Graph - Simple Graph - General Graph - Degree of Graph - Order of a Graph - Size of a Graph - Null Graph - Isolated Graph - Regular Graph - Isomorphic Graphs. **Matrix Representation of Graphs:** Adjacency Matrices - Incidence Matrix - *Sub Graph* - Euler Graph - Hamiltonian Graph.	11
Unit IV	**Matrices:** Introduction - Definition - Rank of a Matrix - Elementary Transformations - Solution of a System of linear equations. Eigen values and Eigen Vectors - Singular and Non Singular Matrix – Adjacent Matrix - Inverse (or reciprocal) of a Square Matrix.	11
Unit V	**Discrete Probability :** Introduction - Sample space – Event - Exhaustive event - Favorable event - Mutually exclusive events - Equally likely events - Independent events – Probability - Axioms of probability - Extension of general law of addition of probabilities - Conditional property - Multiplication law of Probability - Multiplication law of Probability for independent events - *Extension of multiplication law of probability* - Total Probability - Baye's theorem.	11
	Total Contact Hrs	52

- The topics given in **Italics** are noted as Self-Study topics.

Books for Study

1. P.Geetha "Discrete Mathematics", SCITECH PUBLICATIONS (INDIA) PVT. LTD., Chennai 2011 (Unit 1-5).
2. Dr.M.K.Venkataraman, Dr.N.Sridharan, N.Chandrasekaran, "Discrete Mathematics", National Publishing Company, First Edition - 2000.

Books for References

1. 1 Ralph P.Grimaldi, *Discrete and Combinatoral Mathematics - An applied introduction*, Third Edition, Addison Wesley Publishing Company, 1994.
2. Tremblay J. P and Manohar R, *Discrete Mathematical Structures with Applications to Computer Science*, Tata McGraw Hill, 2001.
3. A K Sharma, *Text Book of Matrix*. Discovery Publishing House, 1993.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	H	H	H
CO2	H	M	H	M	H
CO3	H	H	S	H	S
CO4	S	S	H	H	H

S-Strong; H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Dr.R.Malathi Ravindran Signature:	Name: Dr.K.HARIDAS Signature:	Name: Dr.M.DURAIRAJU Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Dr. M. DURAIRAJU, M.Sc.,M.Phil.,B.Ed.,PGDGC.,Ph.D.,
Associate Professor / Co-ordinator,
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

Dr. R.MUTHUKUMARAN
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	19 UBC 413	Title	Batch:	2019-2022
Hrs/Week:	5	WEB DEVELOPMENT	Semester	IV
			Credits	04

Course Objective

To develop knowledge about the methodologies behind VB.NET and ASP.NET. To develop Dot Net based applications using ADO.NET and SQL managed provider-OLEDB managed provider and also enable the students to learn the scripting knowledge through Java Script.

Course Outcomes (CO)

K1	CO1	To recollect the basic structure of Visual Basic .NET and main features of IDE.
K2	CO2	To understand the .NET framework and describe some of the major enhancement to the new version of visual basic and scripting languages.
K3	CO3	To apply message passing mechanism between components and message threads using messaging.
K4	CO4	To analyze the applications using Microsoft windows forms, ADO .Net and Scripting Languages.

Units	Content	Hrs
Unit I	Introduction to .NET: .NET framework- difference between VB6 and VB.NET-Data types-Variables-Operators-Arrays-Conditional logic - Procedures - Dialog boxes.	13
Unit II	Classes and Objects- Multithreading - Visual Basic .NET IDE - Data access: ADO.NET – Data Access in Visual Studio .NET: Visual Studio .NET Database Tools – Visual Studio .NET and ADO.NET.	13
Unit III	Active Server Pages (ASP) - Introduction - Advantages of using ASP - First ASP Script - Processing of ASP Scripts with Forms - Variables and Constructs - ASP Cookies - *ASP Objects* - Connecting to Data with ASP.	13

Unit IV	Introduction to ASP.NET - Page framework - HTML server controls - Web controls - Validation controls - Events-CSS- State management.	13
Unit V	Java Script : Introduction – Language Elements : Identifiers – Expressions – JavaScript Keywords – Operators – Statements _ Functions – Objects of JavaScript : The Window Object – The Document Object – Forms Object – Text boxes and Text areas – Buttons, Radio buttons and Checkboxes – The Select Object – Other Objects – *Arrays*.	13
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study

1. Bill Evjen, Jason Beres, et.al, —Visual Basic .Net programming, Wiley Dreamtech India (p) Ltd. ISBN 81-265-0254-1(Unit I, II & IV).

2. N.P.Gopalan and J.Akilandeswari, "Web Technology – A Developer's Perspective", PHI Learning Private Limited, Delhi, Seventh Edition, 2013. (Unit III & V)

Books for References

1. Fergal Grimes, —Microsoft .NET for programmers||, Shroff publishers & distributors (p) Ltd. ISBN 81-7366-540-0.

2. Thuan Thai & Hoang Q.Lam, —.NET Framework essentials||, Shroff publishers & distributors (p) Ltd. ISBN 81-7366-654-7.

3. Scot Johnson, *Using Active Server Pages*, Prentice Hall of India Pvt. Ltd, Special Edition, 1997

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	M	H
CO2	S	H	M	S	H
CO3	M	H	H	S	H
CO4	H	H	H	M	L

S-Strong; H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Dr.R.Malathi Ravindran Signature: R.Malathi	Name: Dr.K.HARIDAS Signature: Haridas	Name: Dr.M.DURAIRAJU Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Dr. M. DURAIRAJU, M.Sc., M.Phil., B.Ed., PGDCS., Ph.D.,
Associate Professor / Co-ordinator,
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

Dr. R.MUTHUKUMARAN
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	19 UBC 416	Title	Batch:	2019-2022
Hrs/Week:	4	PROGRAMMING LAB VI : WEB DEVELOPMENT	Semester	IV
			Credits	02

Course Objective

To provide students a good understanding and knowledge about Web Service based applications and .net applications

Course Outcomes (CO)

K3	CO1	To remember the .NET environment to create Web Service- based applications and components.
K4	CO2	To get the idea about VB.net and ASP.net.
K5	CO3	To validate the files created in dynamic web pages and java script.

PROGRAMS:

VB.net

1. Write a program to implement Stack operations using array.
2. Write a program to perform file operations.
3. Create a calculator using basic controls.
4. Create an application to illustrate the use of dialog boxes.
5. Create an application for students proctorial list.
6. Create an application for library management system.

ASP.net

1. Create an Alumni registration form.
2. Create a website for online Quiz.
3. Create a portal and validate the web page using validation controls.

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	19 UBC 416	Title	Batch:	2019-2022
Hrs/Week:	4	PROGRAMMING LAB VI : WEB DEVELOPMENT	Semester	IV
			Credits	02

Course Objective

To provide students a good understanding and knowledge about Web Service based applications and .net applications

Course Outcomes (CO)

K3	CO1	To remember the .NET environment to create Web Service- based applications and components.
K4	CO2	To get the idea about VB.net and ASP.net.
K5	CO3	To validate the files created in dynamic web pages and java script.

PROGRAMS:

VB.net

1. Write a program to implement Stack operations using array.
2. Write a program to perform file operations.
3. Create a calculator using basic controls.
4. Create an application to illustrate the use of dialog boxes.
5. Create an application for students proctorial list.
6. Create an application for library management system.

ASP.net

1. Create an Alumni registration form.
2. Create a website for online Quiz.
3. Create a portal and validate the web page using validation controls.

4. Create a web page and validate that page using client side scripting.
5. Write a program to calculate the number of visitors accessed the webpage using cookies.
6. Create a program using AdRotator.

Java script

1. Write a program using opening and closing window.
2. Write a program on math object using java script.
3. Write a program on string object using java script.
4. Write a program on sorting of array using java script.

CSS

1. Create a program using style sheet (Inline, Internal, External).

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	S	S	M
CO2	S	S	H	H	M
CO3	S	H	S	M	M

S-Strong; H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Dr.R.Malathi Ravindran Signature:	Name: Dr.K.HARIDAS Signature:	Name: Dr.M.DURAIRAJU Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Dr. M. DURAIRAJU, M.Sc.,M.Phil.,B.Ed.,PGDCE.,Ph.D.,
Associate Professor / Co-ordinator,
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

Dr. R.MUTHUKUMARAN
Controller of Examinations
NGM College (Autonomous)
POLLACHI

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	19 UBC 5E3	Title	Batch:	2019-2022
Hrs/Week:	5	STORAGE MANAGEMENT	Semester	V
			Credits	05

Course Objective

To understand basic storage system architectures and storage performance management.

Course Outcomes (CO)

K1	CO1	To recollect storage architectures, including storage subsystems and variety of storage system environments
K2	CO2	To get the knowledge of different RAID levels and their suitability on different application environments and understand the characteristics and components of Storage Area Networks (SAN).
K3	CO3	To analyze the components of SAN, Fibre Channel (FC) protocols and topologies, file sharing operations and protocols on Network Attached Storage (NAS).
K4	CO4	To review the different backup, recovery topologies and their role in providing disaster recovery, types of storage virtualization and file level virtualization

Units	Content	Hrs
Unit I	Introduction to Information Storage and Management: Information Storage: Data – Type of Data - Information - Storage – Evolution of Storage Technology and Architecture - Data Center Infrastructure – Core Element - Key Requirement for Data Center Elements - Key Challenges in Managing Information Information Lifecycle: Information Life Cycle Management.	13
Unit II	Storage System Environment and RA/D: Components of Storage System Environment: Host - Connectivity- Storage Disk Drive Components - Platter, Spindle, Read/Write Head, Actuator Arm Assembly, Controller, Physical Disk Structure, Zoned Bit Recording, Logical Block Addressing - Data Protection: RA/D: Implementation of RA/D Software RA/D - Hardware RA/D-RA/D.	13
Unit III	Intelligent Storage System and Storage Area Network: Components Of An Intelligent Storage System: Front End -	13

	Cache – Back End - High End Storage Systems - Midrange Storage System - Storage Area Network: Fibre Channel: Overview - The SAN and its Evolution - Components of SAN - SAN Management Software - Fibre Channel Architecture.	
Unit IV	Network Attached Storage and Content Addressed Scheme: Network Attached Storage: General Purpose Servers Vs NAS Devices - Benefits of NAS - Content Addressed Storage: Fixed Contents and Archives - Types of Archives - Features and Benefits of CAS.	13
Unit V	Storage Virtualization, Backup and Recovery: Forms of Virtualization: Memory Virtualization - Network Virtualization – Server Virtualization - Storage Virtualization- - Backup And Recovery: Backup Process - Disaster Recovery - Operational Back Up - Backup And Restore Operations - Virtual Tape Library.	13
	Total Contact Hrs	65

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study

1. G. Somasundaram and Alok Shrivatsava, "Information Storage Management: Storing, Managing, and Protecting Digital Information", Wiley, 2009.

Books for Reference

1. Ulf Troppens et al, "Storage Networks Explained: Basics and Application of Fibre Channel SAN, NAS, ISCSI, INFINIB and FOCE", Wiley, 2015.
2. Hubbert Smith, "Data Center Storage: Cost-effective strategies, implementation and management", CRC Press, 2011.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	M
CO2	S	L	L	M	S
CO3	S	S	S	S	H
CO4	H	H	S	H	H

S-Strong; H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: R. Arthi Signature:	Name: Dr.K.HARIDAS Signature:	Name: Dr.M.DURAIRAJU Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Dr. M. DURAIRAJU, M.Sc.,M.Phil.,B.Ed.,PGDCC.,Ph.D.,
Associate Professor / Co-ordinator,
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

Dr. R.MUTHUKUMARA
Controller of Examinations
NGM College (Autonomous
POLLACHI - 642 001.

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	19 UBC 5S3	Title	Batch:	2019-2022
Hrs/Week:	1	DISTRIBUTED OPERATING SYSTEM	Semester	V
			Credits	02

Course Objective

To provide students with a thorough grounding in the field of Distributed Operating Systems. It also provides students with an in-depth understanding of the full range of its components. They also gain knowledge about the current state of art in the distributed environment.

Course Outcomes (CO)

K1	CO1	To recollect the models and networks to elucidate the complications in the information and computing environment.
K2	CO2	To understand the architecture and protocols of Distributed systems to help to enhance its features further for advancements.
K3	CO3	To apply the working principles of techniques like Virtualization, Multicasting in various fields in the society.
K4	CO4	To analyze, formulate, and identify the model Distributed environments for creating prototypes and similar systems in user specific applications.

Units	Content	Hrs
Unit I	**Fundamentals:** What is Distributed Computing System? – Distributed Computing System Models (5 models) – Why are Distributed Computing Systems gaining popularity? – Distributed Operating System – Issues in designing a Distributed Operating System – Distributed Computing Environment.	3
Unit II	**Architectures:** System Architectures – Middleware – Self Management in Distributed Systems. **Processes:** Threads in Distributed Systems – Virtualization – Architectures of Virtual Machines – Clients – Networked User Interfaces – Servers.	3
Unit III	**Networks:** Types – **Message Passing:** Inter Process Communication (IPC) – Features of message passing system – Decoding of message	3

	data –*Case study:* BSD UNIX IPC Mechanism.	
Unit IV	**Communication:** Layered Protocols – Types of Communication – Remote Procedure Call – Basic RPC Operation – Parameter Passing – Message oriented Communication – Stream oriented Communication – Multicast Communication – Application Level Multicasting.	2
Unit V	**Naming:** Names, Identifiers, and Addresses – **Synchronization:** Clock Synchronization – Physical Clocks – Logical Clocks – Distributed Algorithm – **Consistency and Replication:** Reasons – Data centric Consistency Models. *Case Study: Inferno OS.*	2
	Total Contact Hrs	13

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study

1. Distributed Operating Systems: Concepts and Design, Pradeep K. Sinha, Prentice Hall of India. (Unit 1 & Unit 3).
2. Distributed Systems: Principles and Paradigms, Andrew S. Tanenbaum, Maarten Van Steen, Prentice Hall, Second Edition (Unit 2, 4 & 5).

Books for Reference

1. Distributed Operating Systems: Concepts and Practice, Doreen L. Galli, Prentice Hall.
2. Distributed Systems: Concepts and Design, George Coulouris, Jean Dollimore, and Tim Kindberg, Pearson Education, 4th Edition.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	H	H	H
CO2	H	H	H	H	M
CO3	S	H	S	H	H
CO4	H	H	S	H	S

S-Strong; H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: POOBATHY.D Signature:	Name: Dr.K.HARIDAS Signature:	Name: Dr.M.DURAIRAJU Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Dr. M. DURAIRAJU, M.Sc.,M.Phil.,B.Ed.,PGDCC,Ph.D.,
Associate Professor / Co-ordinator,
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

Dr. R.MUTHUKUMARAN
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	19 UBC 623	Title	Batch:	2019-2022
Hrs/Week:	5	PYTHON PROGRAMMING	Semester	VI
			Credits	04

Course Objective

The course is designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language.

Course Outcomes (CO)

K1	CO1	To develop python programs for core python and data types using objects and functions.
K2	CO2	To develop python programs for List, Stack, Queues.
K3	CO3	To implement File Objects and Object-Oriented Programming using python.
K4	CO4	To manage Errors and Exceptions and summarize the Network Programming.

Units	Content	Hrs
Unit I	Basics: Python- Variables- Executing Python From the Command Line- Editing Python Files-Python Reserved Words-Basic Syntax-Comments-Strings And Numeric Data Types-Simple Input and Output.	13
Unit II	Control Statements: Control Flow and Syntax-Indenting- If Statement- Relational Operators- Logical Operators- Bit Wise Operators- While Loop- Break and Continue- For Loop-Lists-Tuple -Sets-Dictionaries.	13
Unit III	Functions: Definition- Passing Parameters to a Function-Variable Number of Arguments- Scope-Passing Functions to a Function- Mapping Functions in a Dictionary-Lambda-Modules- Standard Modules- Sys-Math- Time- Dir Function.	13

Unit IV	Error Handling: Run Time Errors-Exception Model-Exception Hierarchy-Handling Multiple Exceptions-Data Streams-Access Modes Writing-Data to a File Reading-Data From a File-Additional File Methods-Using Pipes as Data Streams-Handling IO Exceptions-Working With Directories.	13
Unit V	Object Oriented Features: Classes Principles of Object Orientation-*Creating Classes*-Instance Methods-File Organization-Special Methods-*Class Variables- Inheritance*-Polymorphism-Type Identification-Simple Character Methods-*Special Characters-Character Classes*-Quantifiers-Dot Character-Greedy Matches-Grouping-Matching at Beginning or End-Match Objects-Substituting-Splitting a String-Compiling Regular Expressions.	13
	Total Contact Hrs	65

- The topics given in **Italics** are noted as Self-Study topics.

Creating Classes, Special Characters-Character Classes, Class Variables- Inheritance.

Books for Study

1. **Mark Summerfield**, "Programming in Python 3 ", A Complete Introduction to the Python Language", Addison-Wesley Professional, 2009.
2. **Martin C. Brown**, "Python: The Complete Reference", McGraw-Hill, 2001.

Books for Reference

1. **Allen Downey, Jeffrey Elkner, Chris Meyers**, "Learning With Python", Green Tea Press, Wellesley, Massachusetts, 2016.
2. **Wesley J Chun**. Core Python Application Programming.3rd Edition, Prentice Hall Press Upper Saddle River, NJ, USA ©2012.
3. **Mark Lutz**. Learning Python, 5th Edition, O'Reilly & Associates, Inc. Sebastopol, CA,USA ©2003.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	H	M	M
CO2	H	M	S	S	M
CO3	S	H	H	S	H
CO4	S	M	S	H	H

S-Strong; H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: R. Arthi Signature:	Name: Dr.K.HARIDAS Signature:	Name: Dr.M.DURAIRAJU Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Dr. M. DURAIRAJU, M.Sc.,M.Phil.,B.Ed.,PGDGC,Ph.D.,
Associate Professor / Co-ordinator,
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

Dr. R.MUTHUKUMARAN
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	19 UBC 626	Title		
Hrs/Week:	5	PROGRAMMING LAB –XI: PYTHON PROGRAMMING	Batch:	2019-2022
			Semester	VI
			Credits	02

Course Objective

The course is designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language.

Course Outcomes (CO)

K3	CO1	To develop python programs for list and control statements and understand the Different loops such as "for", "while" and "do-while".
K4	CO2	To manage Errors and Exceptions and summarize the Network Understand Programming.
K5	CO3	To implement File Objects and Object-Oriented Programming using python.

1. Write a program to display the following information: Your name, Full address, Mobile number, College name, Course.
2. Write a program to find the largest three integers using if-else and conditional operator.
3. Write a program to find the product of two matrices.
4. Write a program to find the GCD of two integers.
5. Write a program to print the Fibonacci sequence.
6. Write a GUI program that converts Celsius temperature to Fahrenheit temperature.
7. Write a GUI program that displays your details when a button is clicked.
8. Write a program that opens a specified text file and then displays a list of all unique words Found in the file.
9. Write a program to implement the inheritance and polymorphism.
10. Write a program to display prime number.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	S	S	M
CO2	M	S	M	M	M
CO3	M	M	M	H	H

S-Strong; H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: R. Arthi Signature:	Name: Dr.K.HARIDAS Signature:	Name: Dr.M.DURAIRAJU Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Dr. M. DURAIRAJU, M.Sc.,M.Phil.,B.Ed.,PGDSC.,Ph.D.,
Associate Professor / Co-ordinator,
Curriculum Development Cell (CDC)
NGM College (Autonomous)
Pollachi - 642 001.

Dr. R.MUTHUKUMARAN
Controller of Examinations
NGM College (Autonomous)
POLLACHI - 642 001.