LEARNING OUTCOMES–BASED CURRICULUM FRAMEWORK (LOCF)
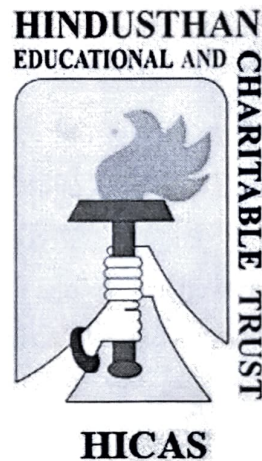
in the

POSTGRADUATE PROGRAMME
MASTER OF COMPUTER APPLICATIONS

FOR THE STUDENTS ADMITTED FROM THE

ACADEMIC YEAR 2021 - 2022 AND ONWARDS

HINDUSTHAN
EDUCATIONAL AND CHARITABLE TRUST

HICAS

HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)
(Affiliated to Bharathiar University and Accredited by NAAC) COIMBATORE-641028
TAMILNADU, INDIA.
Phone: 0422-4440555
Website: www.hindusthan.net/hicas/

PREAMBLE

Learning Outcome Based Curriculum Framework for Postgraduate education in **Master of Computer Applications**

This program focuses on providing a sound theoretical background as well as good practical exposure to students in the relevant areas. It is intended to provide modern, industry-oriented education in applied computer science. This course is inclined towards Application Development and thus has more emphasis on the latest programming language and tools to develop better and faster applications. This course is designed to meet up with the demand of qualified professionals in the IT field.

VISION

To be the source of creating Globally Technical Professionals, Researchers, Entrepreneurs and Innovators with Virtuous Personality, Attitude and Technical Skills to meet the industrial challenges.

MISSION

Offer higher grade Post Graduate and Doctoral Programmes in the Computer Applications Domain and to introduce highly knowledged computer professionals with leadership skills, commitment and moral values as well as to bridge the gap between the industry and the academia by framing and offering the Industry – Expect Curriculum.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1: Augment research and entrepreneurial skills along with a rich set of communication, team work to excel in their profession.

PEO 2: Exhibiting persistent enhancement in their profession through life-long learning, realizing human values and principles.

PEO 3: Demonstrating technical competency and leadership to become professional engineers leading to a successful career.

PEO 4: Pursuing lifelong learning in generating innovative engineering solutions using research and complex problem-solving skills.

PEO 5: Demonstrating commitment towards sustainable development for the betterment of society.

PROGRAMME OUTCOME (PO)

FOR LAB ORIENTED SCIENCE COURSES

PO1: Understanding of computing fundamentals, computing specialization and domain knowledge appropriate for computer professional.

PO2: Identify the need and develop the ability to engage in independent learning and for continual development as a computer professional.

PO3: Ability to understand the impact of professional computing specialization solutions in societal, economic and environmental contexts and demonstrate knowledge of and need for sustainable development

PO4: Develop and apply appropriate techniques, resources, and innovative tools to complex activities

PO5: Ability to demonstrate knowledge and understanding of management principles and apply these effectively as an individual, a member or a leader in diverse teams and in multidisciplinary settings

PO6: Ability to recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PO7: Use research based knowledge and research approaches to provide valid conclusions.

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1: The skills to analyze and develop computer programs in the areas like System Software, Software design, Web designing and Web applications, Big data analytics and Open Source Programming.

PSO2: The ability to put into practice the standard strategies in the software project development using the knowledge acquired and relevant programming technologies and deliver the authentic applications welfare of the society.

PSO3: The ability to create a novel career path to be a software engineer, an entrepreneur and a keenness for research in the computer Science field with the trending Computer languages, technologies and different platforms.

PSO4: Understand, Analyze and Develop research problems example - in medical applications by using innovative tools of varying complexity

PSO5: Demonstrate basic knowledge of computer applications and apply standard practices in software project development.

HINDUSTHAN COLLEGE OF ARTS & SCIENCE (AUTONOMOUS), COIMBATORE-641028

SCHEME OF EXAMINATIONS - CBCS & LOCF PATTERN

(For the Students admitted from the Academic year 2021-2022 and Onwards)

PG PROGRAMME

Programme: Master of Computer Applications   **Branch: Computer Applications**

Course Code	Course Type	Course Title	Credit Points	Lecture Hours/Week Theory	Lecture Hours/Week Practical	Exam Duration (hours)	MAX. MARKS I.E.	MAX. MARKS E.E	MAX. MARKS Total
		Semester – I							
21MCP01	DSC	Programming in Java	4	4		3	40	60	100
21MCP02	DSC	Relational Database Management System	4	5		3	40	60	100
21MCP03	DSC	Security Fundamentals ##	4	4		3	50	50	100
21MCP04	GE	**Allied:** Mathematical Foundations for Computer Science	4	5		3	40	60	100
21MCP05	DSE	**Electives/DSE-I**	3	4		3	40	60	100
21MCP06	DSC	**Practical I - Programming in Java Lab**	3		5	3	50	50	100
21MCP07	DSC	**Practical II – RDBMS Programming Lab**	3		5	3	50	50	100
21MCP08	SEC	**Mini Project Work**	2	-	2	-	100	-	100
21MCPJ01	SEC	**Aptitude / Placement Training**	Grade*	2			50		50**
21MCPV01	ACC	VAC–I	1*	2			50	-	50**
	SEC	SDR – Student Development Record	Assessment will be done in the end of III – rd semester						
		Total	27	26	12		410	390	800
		Semester – II							
21MCP09	DSC	PHP and MySQL Programming	4	4		3	40	60	100
21MCP10	DSC	Data Structures and Algorithms	4	5		3	40	60	100
21MCP11	DSC	Network Technologies	4	5		3	40	60	100

Code	Category	Title	Credits	L/T	P	Exam hrs	CIA	ESE	Total
21MCP12	DSC	Software Development Fundamentals ##	4	4		3	50	50	100
21MCP13	DSE	**Electives/DSE-II**	3	4		3	40	60	100
21MCP14	DSC	**Practical III –** PHP and MySQL Programming Lab	3		5	3	50	50	100
21MCP15	DSC	**Practical IV –** Data Structures Lab	3		5	3	50	50	100
21MCP16	SEC	**Mini - Project Work**	2	-	2	-	100	-	100
21MCPJ02	SEC	**Online Courses**	Grade*	-			-	-	C/NC
21MCPJ03	SEC	**Aptitude / Placement Training**	Grade*	2			50		50**
21MCPV02	ACC	VAC–II	1*	2			50	-	50**
		Total	27	26	12		410	390	**800**
		Semester – III							
21MCP17	DSC	Python Programming	4	5		3	40	60	100
21MCP18	DSC	Data Mining and Warehousing	4	4		3	40	60	100
21MCP19	DSC	Internet of Things	4	5		3	40	60	100
21MCP20	DSC	Big Data Programming and Development ##	4	4		3	50	50	100
21MCP21	DSE	**Elective/DSE- III**	3	4		3	40	60	100
21MCP22	DSC	**Practical V –** Python Programming Lab	3		5	3	50	50	100
21MCP23	DSC	**Practical VI –** Data Mining with R Tools Lab	3		5	3	50	50	100
21MCP24	SEC	Mini – Project Work	2	-	2		100	-	100
21MCPJ04	SEC	**Aptitude / Placement Training**	Grade*	2			50		50**
21MCPJ05	SEC	**Online Courses**	Grade*	-			-	-	C/NC
21MCPV03	ACC	VAC–III	1*	2			50	-	50**
21MCPJ06	SEC	SDR – Student Development Record	2*	-	-	-	-	-	-
		Total	27	26	12		410	390	**800**

		Semester – IV							
21MCP25	SEC	Project Work	10	-				50	150	200
		Total	10					50	150	200

- * denotes Extra credits which are not added with total credits.
- ** denotes Extra marks which are not added with total marks.
- **VAC**-Value Added Course (Extra Credit Courses)
- * Grades depends on the marks obtained
- ## Microsoft and HPE Papers

Range of marks	Equivalent remarks
80 and above	Exemplary
70 – 79	Very good
60 – 69	Good
50 – 59	Fair
40 – 49	Satisfactory
Below 39	Not Satisfactory = Not Completed

- Part IV & V not included in total marks and CGPA calculation.
- **I.E**-Internal Exam
- **E.E**-External Exam
- **J**-Job Oriented Course
- **V**-Value Added Course
- **E**-Open Electives

PASSING MINIMUM
- Passing Minimum for PG 50%

Abstract for Scheme of Examination

(For the students admitted during the academic year 2021 - 2022 and onwards)

Course	Papers	Credit	Total Credits	Marks	Total Marks
Core /**DSC**	11	4	**44**	100	**1100**
Electives/**DSE**	3	3	**9**	100	**300**
Practical **DSC**	6	3	**18**	100	**600**
Project **SEC**	1	10	**10**	200	**200**
Allied **GE**	1	4	**4**	100	**100**
Mini-Project	*3*	*2*	*6*	*100*	*300*
Job Oriented Course / Value Added Course	*3*	*1**	*3**	*50*	*50***
Skill Based/ Placement/Aptitude **SEC**	3	Grade*	Grade*	50	**150****
Online Courses / SEC	**2**	Grade*	Grade*	-	-
SDR – SEC	**1**	2*	-	-	-
Total			**91 (5 Extra Credits)**		**2600 + (300**)**

List of Open Elective Papers	
VAC Papers	Problem Solving Techniques Overview of Operating Systems Java Collection and Web Services Network Simulator Digital Marketing Angular JSP
Courses offered by the Departments to other Programmes	
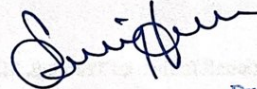
	List of Elective Papers/ DSE (Can choose any one of the paper as electives)	
	Course Code	**Title**
Electives/ **DSE-I**	21MCP05 (A)	Cloud Computing
	21MCP05 (B)	Web Services
	21MCP05 (C)	AI and Machine Learning
	21MCP05 (D)	Human to Computer Interaction
Electives/ **DSE-II**	21MCP13 (A)	Neural Networks
	21MCP13 (B)	Block Chain Technologies
	21MCP13 (C)	Data Science
	21MCP13 (D)	Embedded Systems
Electives/ **DSE-III**	21MCP21 (A)	Enterprise Resource Planning
	21MCP21 (B)	Ethical Hacking and Cyber Forensics
	21MCP21 (C)	Network Security and Cryptography
	21MCP21 (D)	Green Computing
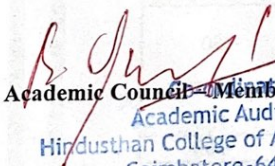
Syllabus Coordinator

BOS-Chairman/Chairperson

Academic Council - Member Secretary

PRINCIPAL

PG/MCA Scheme of Evaluation (Internal & External Components)

(For the students admitted during the academic year 2021-2022 and onwards)

1. Internal Marks

Components	Marks
Test	10
Model Exam	10
Internal Assessment components	20 #
TOTAL	**40**

List of components for Internal Assessment

S.No	Components
1	Multiple choice questions
2	Quiz
3	Video teach
4	UT – Unannounced test
5	Co-operative or Collaborative Learning
6	Mini Project/Assignment
7	Case study
8	Seminar

(Any four components from the above list with five marks each will be calculated .4x5=20 marks)

2. a) Components for Practical I.E.

Components	Marks
Test –I	20
Test - II	20
Application*	10
Total	**50**

b) Components for Practical E.E.

Components	Marks
Experiments	40
Record	5
Viva	5
Total	**50**

3. Institutional/ Industrial Training, Mini Project and Major Project Work

Internships/Industrial Training (I.E)		Major Project Work		
Component	Marks	Component	Marks	Total Marks
Work diary	25	I.E a)Attendance	20	
Report	50	b)Review	30	50
Viva-voce	25			
Total	**100**	E.E* a) Final report	120	
		b)Viva-voce	30	150
		Total		**200**

*Evaluation of report and conduct of viva voce will be done jointly by Internal and External Examiners

4. Value Added Courses / Aptitude/Placement courses:

Components	Marks
Two Test (each 1 hour) of 25 marks each QP is objective pattern (25x1=25)	50
Total	**50**

5. Guidelines for Open Elective

No of Activities	Marks
Two Tests (each 3 hours) of 50 marks each [5 out of 8 descriptive type questions 5 x 10 = 50 Marks]	100

Guidelines:

1. The passing minimum for these items should be 50%

2. If the candidate fails to secure 50% passing minimum, he / she may have to reappear for the same in the Subsequent semesters

3. Item No's:4 is to be treated as 100% Internals and evaluation through online.

4. Item No.2: * - Application should be from the relevant practical subject other than the listed programme. It must be enclosed in the practical record.

<u>QUESTION PAPER PATTERN FOR CIA EXAM</u>

Reg.No:—————   Q.P.CODE:

HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

PG/MBA/MCA DEGREE CIA EXAMINATIONS ———————20———

(————Semester)

BRANCH: ————

Subject Name: —————

Time: Two Hours   Maximum: 50 Marks

<u>Section-A (3 x 4=12 Marks)</u>

Answer **ALL** Questions

ALL questions carry **EQUAL** Marks

(Q.No: 1 to 3 Either Or type)

<u>Section-B (2 x 12=24 Marks)</u>

Answer any **TWO** Questions out of **THREE** Questions

ALL questions carry **EQUAL** Marks

(Q.No: 4 to 6)

<u>Section-C (1 x 14=14 Marks)</u>

(Compulsory Question: It should be a Case study/Application oriented/Critical analysis

from any of the units)

(Q.No: 7)

<u>QUESTION PAPER PATTERN FOR MODEL / END SEMESTER EXAM</u>

Reg.No:—————————   Q.P.CODE:

HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

PG/MBA/MCA DEGREE MODEL EXAMINATIONS ——————20———

(————Semester)

BRANCH: ————

Subject Name: —————

Time: Three Hours   Maximum: 60 Marks

<u>SECTION – A (5x4=20 marks)</u>

Answer **ALL** Questions

ALL Questions carry **EQUAL** Marks

(Q.No 1 to 5 Either Or type)

(One question from each Unit)

<u>SECTION – B (3x10=30 Marks)</u>

Answer any **THREE** Questions Out of **FIVE** Questions

ALL Questions carry **EQUAL** Marks

(Q.No 6 to 10)

(One question from each Unit)

<u>SECTION – C (1x10=10Marks)</u>

(Compulsory Question: It should be a Case study/Application oriented/Critical analysis

from any of the units)

(Q.No: 11)

Microsoft Papers Evaluation Method & HPE Papers Evaluation Method

1. **Subjects involved:**

Semester	Subjects to be taken	Association	No. of Students (Min)
I	Security Fundamentals	Microsoft	40
II	Software Development Fundamentals	Microsoft	40
III	Machine Learning & Deep Learning	HPE	40

2. **Duration of All Subjects Stated Above:** 45 Hours Minimum (Theory + Practical)

3. **Continuous Internal Assessment:** 3 Tests will be conducted under 50-50 Pattern

   ➢ **Internal Marks split-up:**

Components	Marks
Class Assignment	25
Class Attentiveness	15
Class Attendance	10
TOTAL	**50**

4. **External Marks guidelines:**

   Online Exam with objective Pattern will be conducted (OR) Question Paper will be given for Theory Exam

5. **Final Exam (Global Certification Exam)**
   - ✓ 50-50 Pattern will be followed
   - ✓ Best of 2 Continuous Assessment Test will be considered for Internal 50 Marks
   - ✓ Online Exam will be conducted for remaining 50 Marks
   - ✓ Course completion Certificate will be issued for candidates securing more than 50% marks
   - ✓ Global Certification will be issued for candidates securing more than 70% marks

In case of Failure a candidate can take the exam after 24 hours after getting the results

Course Code	21MCP01	Course Title					Batch	2021-2022 & Onwards
		PROGRAMMING IN JAVA					Semester	I
Hours / Week	4	L	4	T	-	P	- Credits	4

COURSE OBJECTIVE

1. To understand the concepts of Core Java
2. To acquire the knowledge of Interfaces, Packages and their tools
3. To apply the Java concepts with Network Programming with JDBC
4. To learn about the extended features of Java programming
5. To analyze Java applications using connectivity

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand the perception of various GUI tools	K2
CO2	Indentify the knowledge of various components used at server side	K1
CO3	Apply the Interface, API and Package to manipulate data in numerous applications	K3
CO4	Apply the visual basic concepts to create various domains	K3
CO5	Analyzing various applications using the Connectivity JDBC	K4
	KI- Remember, **K2**- Understand, **K3**- Apply, **K4**- Analyse, **K5**–Evaluate	

SYLLABUS

21MCP01	PROGRAMMING IN JAVA	Sem: I
Unit No.	Topics	Hours
I	**Introduction to Java**: Java buzzwords – Overview of Java – Data types – Operators – Control Structures: selection statement - Iterative statement – Arrays and methods. Methods: program modules in JAVA – Methods – Method definitions – JAVA API packages – Duration of identifiers – Scope rules – Method overloading.	10

II	**Interface and Package**: class fundamental – constructors –constructor overloading- Inheritance and Polymorphism. String constructors – String methods: length, CharAt, getChars, hash Code, value of, intern and miscellaneous string methods – Substrings and concatenating strings – String Buffer class – String Tokenizer Class. **Java API:** Interfaces andJava Packages-Exception Handling-multithreading-I/O stream-Random access file class	11
III	**GUI Tools**: Applet – AWT-Button control, Radio Button, menu, dialog box – Swing –JComponents – Jpanel - JMenu-Layout manager. Networking fundamentals-socket overview – TCP-IP Client socket- Datagram client and server socket – RMI – Java Bean –BDK-JAR file- Manifest file - Creating simple bean.	11
IV	**JDBC concepts**:-Introduction to JDBC Driver-JDBC class and interface - Database connection-Statement Object-Result set- Transaction processing-meta Data-Creation of Table- Dropping a-Updating row and Column in Table –Calculating data-Grouping and ordering Data.	10
V	**Advanced Features of Java**: Servlet-Life cycle of Servlet-Servlet API-Simple java Servlet - Handling HTTP Request and Response- JSP:-JSP tags-method- conditional Statements Iterative statements User Session-Cookies-Case Study- Data Transmission using servlet	10

Note: Internal – 40, External –60.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

TEXT BOOKS

1. Herbert Scheldt," The Complete Reference JAVA2", Tata McGraw-Hill, 7th Edition.2010.
2. Herbert Scheldt "The Complete Reference J2EE", Tata McGraw Hill,7thEdition.2012

REFERENCE BOOKS

1. Muthu C, "Programming with Java", Tata McGraw Hill, Second Edition, 2010.
2. DeitelandDeitel,"JavaHowtoProgram",PHI/PearsonEducationAsia,ThirdEdition.2015.
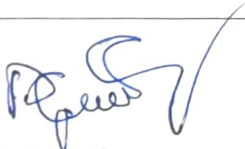3. KeyurShab,"Java 2 Programming", Tata McGraw-Hill Pub. Company Ltd, 2002.

MAPPING WITH PROGRAM OUTCOMES

PO-CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M	M	M	M	S	M
CO2	S	S	M	M	M	M	M
CO3	S	M	M	L	M	S	M
CO4	S	S	S	S	S	S	M
CO5	S	M	M	M	M	S	L

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Mr. A. Ganesan) Name & Signature of the Staff	**(Dr. A. V. Senthil Kumar)** Name & Signature	Name & Signature

Course Code	21MCP02	Course Title						Batch	2021-2022 & Onwards
		RELATIONAL DATABASE MANAGEMENT SYSTEM						Semester	I
Hours / Week	5	L	4	T	-	P	-	Credits	4

COURSE OBJECTIVE

1. To summarize the various Users and Designs of Database
2. To understand the features of Relational models and basic statements of SQL
3. To apply the functions with Normalization models and dependencies
4. To organize the stored files in the database using various techniques.
5. To analyze various storage levels and Indexing.

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand the basic concepts of database architecture and database users.	K2
CO2	Exemplify about knowledge on the Database design.	K2
CO3	Experimenting the knowledge about Relational Model and Relational Algebra.	K3
CO4	Determine the knowledge about normalization techniques.	K3
CO5	Evaluate the knowledge on storing data on secondary storage devices	K5

KI - Remember, **K2** - Understand, **K3** - Apply, **K4** - Analyse, **K5** - Evaluate

SYLLABUS

21MCP02	RELATIONAL DATABASE MANAGEMENT SYSTEM	Sem: I
Unit No.	Topics	Hours
I	**Databases and Database Users** Introduction - Characteristics of the database approach - Actors - Advantages. Database system - History of Data base applications. Data Base system concepts and Architecture- Data models, Schemes and instances - Three schema architecture - Data Independence - DBMS Languages and Interfaces – Database system Environment- DBMS component modules - centralized DBMS architecture – Basic Client/Server Architecture.	12

II	**Database Design** Using High level conceptual data models - Entity types, entity sets - Attributes and keys - Relationship types, Relationship sets, roles and structural constraints - weak entity types refining the ER design - ER Diagrams - naming conventions - The Enhanced Entity–Relationship (EER) - EER modeling - Relationship types of degree higher than two.	12
III	**Relational Model** Relational model concepts - relational model constraints - Relational database schemas - Update operations and dealing with constraints violations. Relational Algebra - unary Operations - Set operations -Binary Operations - additional operations. ER and EER to relational Mapping - Relational Database Design Using ER-to-Relational Mapping EER Model Constructs to Relations. **SQL** - Schema Definition, Basic constraints and Queries: SQL Data Definition - Specifying basic constraints - Schema change Statements - Basic queries - complex queries - other DML statements - views - Programming with PL/SQL.	13
IV	**Normalization** Informal Design guidelines - Functional Dependencies - Definition - Inference rules - Normal forms based on Primary keys - General definitions of 2NF and 3NF - BCNF - Properties of relational decompositions - Multi-valued Dependencies and 4NF.	14
V	**Data Storage and Indexing** File Organizations and Indexed – Secondary storage devices - Buffering of Blocks - Placing File records on disk - Files of ordered and unordered records – Hashing Techniques - RAID Technology - Indexing structures for files - Types of Single-Level Ordered Indexes -Multilevel Indexes - Indexes on Multiple Keys	14

Note: Internal – 40, External –60.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

TEXT BOOKS

1. RamezElmasri, Shamkant B. NavatheDurvasula, V.L.N.Somayajulu, ShyamK. Gupta, "Fundamentals of Database Systems", Fourth Edition, Pearson Education, 2006.

2. ChristoperAllen, Simon Chatwin, Catherine A. Creary, "Introduction to relational Databases and

SQL Programming" Tata McGraw-Hill.

REFERENCE BOOKS

1. Silberschatry, Korth, Sundarshan, Database system Concepts, McGraw-Hill Higher Education, Fourth Edition, 2008.

2. ElmasriRamez, NavatheShamkant, Fundamentals of Database System, Pearson Paperback, Seventh Edition, June2017.

3. Rajiv Chopra, Database Management Systems (DBMS), S Chand & Co Ltd, Revised Edition, Jan 2016.

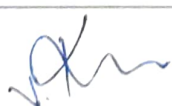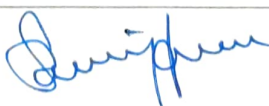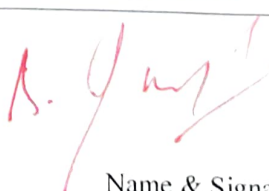4. Raghu Ramakrishnan and Johannes Gehrke, Database Management Systems, McGraw Hill Education, July2014.

MAPPING WITH PROGRAM OUTCOMES

PO\CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	S	M	M	M	S	S
CO2	M	S	M	M	M	S	S
CO3	M	M	S	S	S	S	S
CO4	M	M	S	M	S	S	S
CO5	M	M	M	S	M	S	S

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Dr. V. Kavitha) Name & Signature of the Staff	**(Dr. A. V. Senthil Kumar)** Name & Signature	Name & Signature

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science,
Coimbatore-641 028.

Course Code	21MCP03	Course Title		Batch	2021-2022 & Onwards
		SECURITY FUNDAMENTALS##		Semester	I
Hours / Week	4	L	4	T	-	P	-	Credits	4

COURSE OBJECTIVE

1. To learn about Operating system security
2. To summarize various security layers
3. To apply security layers with network security techniques
4. To study and applying security features with security software
5. To analyze and understand client - server architecture concept

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand the basic concepts of details of user authentication, File permission, Password policies, Encrypting file system and malware.	K2
CO2	Outline knowledge about the security principles.	K1
CO3	Examine the knowledge about dedicated firewall network isolation.	K3
CO4	Illustrate the knowledge about protecting the client, server and e-mail from Virus.	K4
CO5	Evaluate the knowledge spoofing and phishing.	K5

KI - Remember, K2 - Understand, K3 - Apply, K4 - Analyse, K5 –Evaluate

SYLLABUS

21MCP03	SECURITY FUNDAMENTALS##	Sem: I
Unit No.	Topics	Hours
I	**Understand Operating System Security** Understand User Authentication – Understand Permissions – Understand – Password Policies – Understand Audit Policies – Understand Encryption – Understand Malware.	12
II	**Understand Security Layers** Understand Core Security Principles - Understand Physical Security - Understand Internet Security - Understand Wireless Security.	12
III	**Understand Network Security** Understand Dedicated Firewalls - Understand Network Isolation - Understand Protocol Security.	14

IV	**Understand Security Software** Understand Client Protection - Understand Email Protection - Understand Server Protection.	14

Note: Internal – 50, External – 50.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

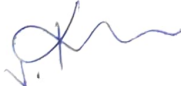## MAPPING WITH PROGRAM OUTCOMES

PO\CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M	M	L	M	S	S
CO2	S	S	M	M	S	S	S
CO3	S	S	M	M	M	S	M
CO4	S	M	M	S	S	S	S

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
Dr. V KAVITHA Name & Signature of the Staff	**(Dr. A. V. Senthil Kumar)** Name & Signature	Name & Signature

Course Code	21MCP05	Course Title				Batch	2021-2022 & Onwards
		ELECTIVE I : (A) CLOUD COMPUTING				Semester	I
Hours / Week	4	L	4	T	-	P	-	Credits	3

COURSE OBJECTIVE

1. To study about the Virtual machine and the virtualization method
2. To understand the functions of cloud computing and its features working with data center's
3. To apply various services with the cloud technology
4. To work with storage and recovery of applications in the cloud
5. To analyze various cloud platforms and disaster recovery methods

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand the cloud computing technology and different services	K2
CO2	Compare the difference between the various available cloud services	K2
CO3	Apply the kind of cloud service required for a specific process	K3
CO4	Analyze about the cloud Storage systems and cloud security, the risks involved and its impact	K4
CO5	Experiment the applications that use cloud computing and sort out the related security issues	K5
KI - Remember, K2 - Understand, K3 - Apply, K4 - Analyse, K5 –Evaluate		

SYLLABUS

21MCP05	ELECTIVE I : (A) CLOUD COMPUTING	Sem: I
Unit No.	Topics	Hours
I	**Introduction to Virtualization and Virtual Machine:** Virtualization in Cluster/Grid Context -Virtual Network, Information Model and Data Model for Virtual Machine-Software as a Service (SaaS)- SOA on Demand Computing.	10
II	**Cloud computing:** Introduction- Cloud Application Architectures - Value of Cloud Computing-Cloud Infrastructure Models – Scaling a Cloud Infrastructure - Capacity Planning - Cloud Scale.	10

III	**Data Center to Cloud:** Software Licenses, The Shift to a Cloud Cost Model, Service Levels for Cloud Applications-Security: Disaster Recovery-Web Application Design, Machine Image Design - Privacy Design-Database Management-Data Security - Network Security- Host Security - Compromise Response.	10	
IV	**Defining Clouds for the Enterprise:** Storage – as – a – Service, Database – as – a – Service, Information – as – a – Service, Process – as – a – Service, Application – as – a – Service, Platform – as - a – Service, Integration – as-a – Service, Security – as – a – Service, Management/Governance – as – a – Service, Testing –as – a – Service, Infrastructure – as – a – Service.	11	
V	**Cloud Platform and Disaster Recovery:** Introduction to various Cloud Platform options, Cloud Foundry concepts and deploying applications on Cloud Foundry, Backup and restore cloud foundry installations, Upgrade cloud foundry installations. **Disaster Recovery** – Planning - Cloud Disaster Management Case Study: Types of Clouds- Cloud Centers in Detail-Comparing Approaches- Xen, OpenNEbula,Eucalyptus, Amazon & Nimbus.	11	

Note: Internal – 40, External –60.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

TEXT BOOKS

1. Michael Miller „Cloud Computing-Web Based Applications That Change the Way You Work and Collaborate Online", Pearson Education, 2008.
2. George Reese, "Cloud Application Architectures", 1stEdition,O"Reilly Media,2009.

REFERENCE BOOKS

1. David S. Linthicum,,, Cloud Computing and SOA Convergence in Your Enterprise: A Step-by-Step Guide", Addison-Wesley Professional,2010.
2. Ritting house, John W., and James F. Ransome, —Cloud Computing: Implementation, Management and Security, CRC Press, 2017.
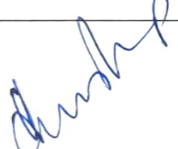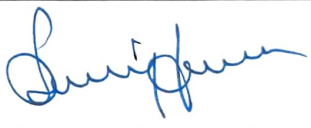
MAPPING WITH PROGRAM OUTCOMES

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M	M	L	M	S	S
CO2	S	S	M	M	S	S	S
CO3	S	S	M	M	M	S	S
CO4	S	M	M	S	S	S	S
CO5	S	M	S	M	M	S	S

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Mrs. P. Hemashree) Name & Signature of the Staff	**(Dr. A. V. Senthil Kumar)** Name & Signature	Name & Signature

Course Code	21MCP05	Course Title					Batch	2021-2022 & Onwards
		ELECTIVE I : (B) WEB SERVICES					Semester	I
Hours / Week	4	L	4	T	-	P	-	Credits	3

COURSE OBJECTIVE

1. To learn about Web services and its features
2. To elaborate the functionalities and fundamental concepts of SOAP, WSDL and XML
3. To study about UDDI and its working functions
4. To summarize the quality of service for web services
5. To analyze different concepts of Quality of Service

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand the basic concepts of Web Services	K2
CO2	Illustrate about various tools of web services.	K4
CO3	Apply the knowledge about the fundamentals of XML	K3
CO4	Apply the concepts of Tools of Web Services (UDDI, SOAP & WSDL etc.,)	K3
CO5	Analyzing the various concepts of Quality of Service.	K4

KI - Remember, **K2** - Understand, **K3** - Apply, **K4** - Analyse, **K5** - Evaluate

SYLLABUS

21MCP05	ELECTIVE I : (B) WEB SERVICES	Sem: I
Unit No.	Topics	Hours
I	**Introduction to Web Services:** Introduction to Web Services – Definition of Web service – Basic operational model of web service – tools and Technologies – Characteristics – Benefit & challenges of web service – Architecture of web service – Building blocks of web service – Standard & technologies available for web service – Types of Web Services	10
II	**SOAP:** Fundamentals of SOAP, SOAP message structure, Encoding of different data type, SOAP message exchanging model, SOAP communication and Messaging, Limitation of SOAP - SOAPUI-Setup-Properties-Steps in SOAPUI. - Describing Web services, WSDL, WSDL in the world of web services, Web service life cycle, Anatomy of WSDL	11

	definition document, WSDL buildings, WSDL Tools, Limitation of WSDL	
III	**XML Fundamentals:** Design of an XML Document – XML Namespaces – XML Schema – Processing XML Feedback – XML Encryption – XML Signature - Parser - Browsers and XML - Create DTD-Create XML Schema-Create an XSLT - XSL-FO(Formatting Object)	10
IV	**UDDI :** Discovering web services, Service discovery, Role of service discovery in SQA, Service discovery and UDDI, UDDI registries and its Uses, UDDI Technical Architecture - UDDI registries, Use of UDDI registries, Programming with UDDI, UDDI data structure, Publishing API, Searching and selecting Information in a UDDI registries	11
V	**Quality of Service:** Importance of QoS for Web Services – QoS Metrics – QoS Issues in Web Services -Holes – Design Patterns – QoS Enable Web Services – QoS Enabled Applications. Web Services Management – Web Services Standards andFuture Trends	10

Note: Internal – 40, External –60.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

TEXT BOOKS

1. Ramesh Nagappan, Robert Skeczylas, Rima Patel Sriganesh, "Developing Java Web Services", Wiley India Edition,2013.

2. Sandeep Chatterjee, James Webber," Developing Enterprise Web Services: An Architects Guide", Prentice Hal,2004.

REFERENCE BOOKS

1. Ethan Carami, "Web Services Essentials", O"Reily Media, 2002.

2. RandyJ.Ray and Pavel Kulchenke, "Programming Web Services with Perl", O"Reily Media, 2002.

3. GottfriedVossenandStephanMagemann,"UnleashingWeb2.0fromConceptstoCreativity, Morgan Kaufmann Publishers,2002.
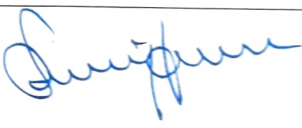
MAPPING WITH PROGRAM OUTCOMES

PO-CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M	M	L	M	S	S
CO2	S	S	S	M	S	S	M
CO3	S	M	M	L	M	S	M
CO4	S	M	M	S	M	M	S
CO5	S	M	S	M	S	M	M

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Mrs. B. Sathyabama) Name & Signature of the Staff	**(Dr. A. V. Senthil Kumar)** Name & Signature	Name & Signature

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science,
Coimbatore-641 028.

Course Code	21MCP05	Course Title					Batch	2021-2022 & Onwards
		ELECTIVE I : (C) AI AND MACHINE LEARNING					Semester	I
Hours / Week	4	L	4	T	-	P	-	Credits	3

COURSE OBJECTIVE

1. To explaining the basic Introduction of Artificial Intelligence
2. To evaluate Problem Solving with Searching Techniques
3. To represent with Knowledge information's and its representation
4. To classify various Artificial Intelligence techniques
5. To analyze different machine learning algorithms

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand primary concepts of AI and Machine Learning	K2
CO2	Understand the Computational Models of Classification, Regression using supervised learning and Predictive Analytics with Ensemble Learning	K2
CO3	Present about the various approaches of Artificial Neural Networks	K3
CO4	Analyze the real world problem for understanding and implementation of the dynamic behavior of Machine Learning	K4
CO5	Defend about the different machine learning techniques to design AI machine for real world problems.	K5

KI - Remember, K2 - Understand, K3 - Apply, K4 - Analyse, K5 –Evaluate

SYLLABUS

21MCP05	ELECTIVE I : (C) AI AND MACHINE LEARNING	Sem: I
Unit No.	Topics	Hours
I	**Overview of AI:** Basics of Artificial intelligence (AI) – Necessity of learning AI – Applications of AI – Branches of AI – Intelligence - Agent and Environment, Overview of Knowledge Inferring systems and Planning	10
II	**Problem Solving by Search:** Search space - Blind Search – DFS, BFS, Iterative Deepening-Performance measures, Informed Search - Introduction to Heuristics- Variants of heuristic search-uniform cost, A*,Greedy– Adversarial Search – Minimax, Alpha beta pruning	10

III	**Knowledge Representation**: Logic, Semantic Networks, Frames, Rules, Scripts, Conceptual Dependency, and ontologies, Expert Systems, Handling Uncertainty in Knowledge	11
IV	**Machine Learning Algorithms 1**: Introduction to Machine Learning Methods, Classification of Machine Learning methods, Multiple Variable Linear regression, Multiple regression, Logistic regression, K-NN classification, Naive Bayes classifiers, and Support vector Machines.	11
V	**Machine Learning Algorithms 2**: K-means clustering, Hierarchical clustering, High-dimensional clustering, Dimension Reduction PCA, Ensemble techniques Decision Trees, Random Forests, Bagging, Boosting - Value based methods Q-learning.	10

Note: Internal – 40, External –60.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

TEXT BOOKS

1. ChandraS.S.V, "Artificial Intelligence and Machine Learning", Prentice Hall India Learning Private Limited; 4 edition(2018)
2. Janet Finlay and Alan Dix, "An Introduction To Artificial Intelligence", CRC Press; 1st edition, 2017

REFERENCE BOOKS

1. A First Course in Artificial Intelligence, Deepak Khemani, McGraw Hill Education (India),2013.
2. Yager, Ronald R., and LotfiA. Zadeh, Eds. An introduction to fuzzy logic applications in Intelligent Systems. Vol.165. Springer Science & Business Media,2012
3. Abe, Shigeo. Neural networks and fuzzy systems: theory and applications. Springer Science & Business Media, 2012.
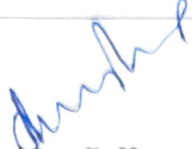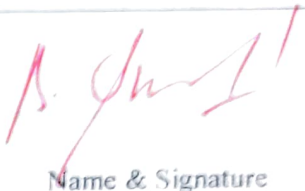
MAPPING WITH PROGRAM OUTCOMES

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M	S	S	S	S	S
CO2	M	S	M	M	M	S	S
CO3	M	S	M	L	M	S	S
CO4	S	M	S	M	S	S	S
CO5	S	S	S	S	M	S	S

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Mrs. P. Hemashree) Name & Signature of the Staff	(Dr. A. V. Senthil Kumar) Name & Signature	Name & Signature

Course Code	21MCP05	Course Title		Batch	2021-2022 & Onwards
		ELECTIVE I : (D) HUMAN TO COMPUTER INTERACTION		Semester	I
Hours / Week	4	L	4	T	-	P	-	Credits	3

Course Code	21MCP05	**Course Title**: ELECTIVE I : (D) HUMAN TO COMPUTER INTERACTION	Batch	2021-2022 & Onwards
			Semester	I
Hours / Week	4	L 4 T - P -	Credits	3

COURSE OBJECTIVE

1. To learn about basics of Human to Computer Interaction
2. To summarize the Design process and various theoretical models of HCI
3. To explain the functions of mobile HCI
4. To study about the web applications using Interface designs
5. To analyze various types Web Interface designs

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand the design effective of Human Computer Interaction.	K2
CO2	Estimate about the effective dialog for Human Computer Interaction	K2
CO3	Interpreter the designing of Web Interfaces	K2
CO4	Analyze the knowledge about various Models, Internet and WWW	K4
CO5	Evaluate the knowledge about various types of Mobile Applications like Widgets, Applications and Games	K5

KI - Remember, **K2** - Understand, **K3** - Apply, **K4** - Analyse, **K5** - Evaluate

SYLLABUS

21MCP05	ELECTIVE I : (D) HUMAN TO COMPUTER INTERACTION	Sem: I
Unit No.	**Topics**	**Hours**
I	**Foundations of HCI:** The Human: I/O channels – Memory – Reasoning and problem solving; The computer: Devices – Memory – processing and networks; Interaction: Models–frameworks–Ergonomics–styles–elements–Interactivity- Paradigms.	10
II	**Design & Software Process:** Interactive Design basics–process–scenarios–navigation–screen design – Iteration and prototyping. HCI in software process – software life cycle–usability engineering–Prototyping in practice– design rationale. Design rules – principles, standards, guidelines, rules. Evaluation Techniques – Universal Design.	12

III	**Models and Theories:** Cognitive models –Socio-Organizational issues and stake holder requirements – Communication and collaboration models- Hypertext, Multimedia and WWW.	10
IV	**Mobile HCI:** Mobile Ecosystem: Platforms, Application frameworks- Types of Mobile Applications: Widgets, Applications, Games- Mobile Information Architecture, Mobile 2.0, Mobile Design: Elements of Mobile Design, Tools.	10
V	**Web Interface Design:** Designing Web Interfaces – Drag & Drop, Direct Selection, Contextual Tools, Overlays, Inlays and Virtual Pages, Process Flow. Case Studies.	10

Note: Internal – 40, External –60.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

TEXT BOOKS

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, "Human Computer Interaction",3rd Edition, Pearson Education,2014

REFERENCE BOOKS

1. Brian Fling, "Mobile Design and Development", First Edition , O"Reilly MediaInc.,2018
2. Bill Scott and Theresa Neil, "Designing Web Interfaces", First Edition,O"Reilly,2009
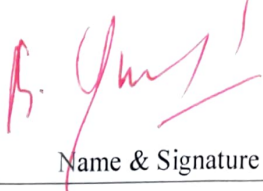
MAPPING WITH PROGRAM OUTCOMES

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M	S	M	S	S	S
CO2	M	S	M	M	M	M	M
CO3	M	S	M	L	M	S	S
CO4	S	M	S	M	S	S	S
CO5	S	M	M	M	M	S	M

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Dr. N. Revathy) Name & Signature of the Staff	**(Dr. A. V. Senthil Kumar)** Name & Signature	Name & Signature

Course Code	21MCP06	Course Title					Batch	2021-2022 & Onwards
		PRACTICAL I – PROGRAMMING IN JAVA LAB					Semester	I
Hours / Week	5	L	-	T	-	P	5	Credits	3

COURSE OBJECTIVE

1. To apply the concepts of Core Java
2. To develop the programs with the concepts of Interfaces, Packages and their tools
3. To apply the Java concepts with Network programming with JDBC
4. To work with advanced features of Java programming
5. To analyze and develop various Java applications

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand an integrated development environment to write, compile, run, and test simple object-oriented Java programs	K2
CO2	Illustrate the elementary modifications to Java programs that solve real-world problems	K4
CO3	Identify and fix defects and common security issues in code.	K1
CO4	Test to validate input in a Java program	K5

KI - Remember, **K2** - Understand, **K3** - Apply, **K4** - Analyse, **K5** –Evaluate

SYLLABUS

21MCP06	PRACTICAL I – PROGRAMMING IN JAVA LAB	Sem: I
Unit No.	Topics	Hours
I	1. Create an employee package to maintain the information about the employee. Use constructors to initialize the employee number and use overloading method to set the basic pay of the employee. By using this package create a java program.	5
	2. Design and Develop a Java program to implement polymorphism, inheritance and inner classes.	6
	3. Create a frame with user specific size and position it at user specific position (use command line argument). Then different shapes with different colors (use menus).	5
	4. Develop a Java program to handle different mouse events.	5
	5. Create an applet for a calculator application.	5

6.	Develop a Java program to maintain the student information in text file.	5
7.	Animate images at different intervals by using multi-threading concepts.	6
8.	Develop a Java program to send a text message to another system and receive the text message from the system (use socket programming).	5
9.	Develop a Java program by using JDBC concepts to access a database.	5
10.	Design and Develop a Java program to implement RMI.	5
11.	Design and Develop a Java program to implement the tree viewer.	5
12.	Develop a Java bean program to view an image.	5
13.	Design a Java program to Create a Dialog Box	5
14.	Create a Java program to implement Tool Bar, Menu & Popup Menu	5

Note: Internal – 50, External – 50.

Teaching Methods: Demonstrating using LCD

MAPPING WITH PROGRAM OUTCOMES

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M	S	M	S	S	L
CO2	S	S	M	M	S	S	M
CO3	S	M	S	L	S	S	M
CO4	S	S	S	S	S	M	M

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Mr. A. Ganesan) Name & Signature of the Staff	(Dr. A. V. Senthil Kumar) Name & Signature	Name & Signature

Course Code	21MCP07	Course Title		Batch	2021-2022 & Onwards
		PRACTICAL II – RDBMS PROGRAMMING LAB		Semester	I
Hours / Week	5	L	-	T	-	P	5	**Credits**	3

COURSE OBJECTIVE

1. To develop simple programs with basic concepts of SQL
2. To work with various functions of SQL
3. To develop simple applications using PL/SQL
4. To apply the functions of advanced PL/SQL statements
5. To analyze and develop various real time complex applications using PL/ SQL

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Find the perception of various data and library functions	K1
CO2	Execute various applications using PL/SQL	K3
CO3	Outline the visual basic concepts to create various domains	K1
CO4	Apply the SQL queries to manipulate data in numerous applications	K3
KI - Remember, K2 - Understand, K3 - Apply, K4 - Analyse, K5 –Evaluate		

SYLLABUS

21MCP07	PRACTICAL II – RDBMS PROGRAMMING LAB	Sem: I
Unit No.	**Topics**	**Hours**
I	1. Creating and Manipulating Tables using SQL Queries and to perform the basic Mysql operations.	4
	2. Develop SQL queries to implement the concept of Constraints while creating tables	5
	3. Retrieve data from a table using various SQL select clause queries.	4
	4. Write SQL Queries to restrict and sort data	5
	5. Write Queries to execute Single row functions such as LENGTH, CONCAT, SUBSTR, INSTR and so on	6

	6. Write a SQL query to display data from multiple tables using joint operations (Inner Join, Outer Join, Left Join, Right Join)	5

<table>
<tr><td rowspan="9" style="vertical-align:middle">I</td><td>6. Write a SQL query to display data from multiple tables using joint operations (Inner Join, Outer Join, Left Join, Right Join)</td><td>5</td></tr>
<tr><td>7. Write Queries for Aggregating data using Group function</td><td>5</td></tr>
<tr><td>8. Develop SQL queries to implement nested sub-queries
   a. Set membership (int, not int)
   b. Set membership (int, not int)
   c. Set comparison (some, all)
   d. Empty relation (exists, not exists)
   e. Check for existence of Duplicate tuples (unique, not unique)</td><td>7</td></tr>
<tr><td>9. Write queries to illustrate the usage of the following features:
   a. Views
   b. Sequence
   c. Index
   d. Synonym</td><td>5</td></tr>
<tr><td><u>PL/SQL</u>
10. Write a SQL query to display Date time functions and execute the SET operations (Union, Intersect, Minus)</td><td>5</td></tr>
<tr><td>11. Write PL/SQL Programs
   a. To calculate Student mark percentage.
   b. To Update the salary in employee table.</td><td>6</td></tr>
<tr><td>12. Write a Cursor to display the list of employees who are working as managers. The Cursor should be Declared, Opened, Fetched and Closed.</td><td>5</td></tr>
<tr><td>13.   a. Write a Procedure which accept the account number of a customer and retrieve the balance
   b. Write a Procedure which accepts the student number and displays the department in which he belongs to</td><td>5</td></tr>
<tr><td>14.   a. Write an update trigger on Account table and keep track of the record that are being updated
   a. Write a before delete trigger on student table</td><td>5</td></tr>
</table>

Note: Internal – 50, External – 50.
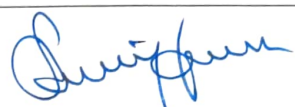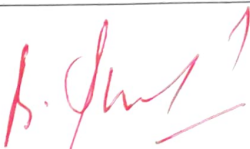
Teaching Methods: Demonstrating using LCD

MAPPING WITH PROGRAM OUTCOMES

PO\CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	S	M	L	S	S	S
CO2	M	M	S	M	S	S	M
CO3	M	S	S	L	S	S	M
CO4	M	S	S	S	M	M	M

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Dr. V. Kavitha) Name & Signature of the Staff	**(Dr. A. V. Senthil Kumar)** Name & Signature	Name & Signature

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science,
Coimbatore-641 028.

Course Code	21MCP09	Course Title					Batch	2021-2022 & Onwards
		PHP AND MySQL PROGRAMMING					Semester	II
Hours / Week	4	L	4	T	-	P	-	Credits	4

COURSE OBJECTIVE

1. To learn about basics of functions of PHP
2. To work with Arrays HTML ,forms with PHP and its features
3. To learn about the basic concepts of MySQL
4. To evaluate the basic functions of MySQL with Files and Directories
5. To analyze various files/directories concepts and different types of operations performed on it

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand primary concepts of PHP	K2
CO2	Understand the concepts of arrays and strings	K2
CO3	Execute various HTML forms with PHP	K3
CO4	Apply the knowledge about the backend - MySQL	K3
CO5	Analyze the concepts of files and various operations performed on it	K4

KI - Remember, **K2** - Understand, **K3** - Apply, **K4** - Analyse, **K5** - Evaluate

SYLLABUS

21MCP09	PHP AND MySQL PROGRAMMING	Sem: II
Unit No.	Topics	Hours
I	**Introduction:** Introduction to PHP - What is PHP?-Uses of PHP - Embedding PHP with HTML, Enhancing further, PHP Language Basics: Using variable in PHP, Understanding Data Types, Operator and Expressions. Decisions and Loops: Simple Decisions with If Statements, Providing an Alternative Choice with the else Statement, Switch, Ternary Operator, Do..While loop, For Statement, Break, Loop Skip Iteration, Nested Loop, Function: Calling Functions, Working with Variable - Functions, Own Functions References, Recursive Functions	10

II	**Arrays:** Creating Arrays, Accessing Array Elements- Looping Through Arrays, Working with Multidimensional Array: Creating a Multidimensional Array - Accessing Elements of Multidimensional Arrays - Looping Through Multidimensional Arrays- Manipulating Array Strings - Creating and Accessing Strings - Searching Strings, Replacing Text Within Strings and Formatting Strings.	11
III	**Handling HTML Forms with PHP:** How HTML Forms work, Capture Form Data with PHP, Dealing with Multi Value Fields, and Generating Web Forms with PHP, Storing PHP Variables in Forms, Create File Upload Forms and Redirecting after form Submission	10
IV	**Introducing Database and SQL:** Deciding how to store data - Setting up MySQL - Quick Play with MYSQL, Connecting to MYSQL from PHP, Retrieving Data from MYSQL with PHP. Manipulating MYSQL: Manipulating MYSQL Data with PHP Insert, Update, Delete Records	11
V	**Working with Files and Directories:** Understanding Files and Directories, Getting Information on Files, Opening and Closing Files, Reading Files and Writing to Files, Working with File Permissions, Copying, Renaming and Deleting Files, Working with Directories.	10

Note: Internal – 40, External –60.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

TEXT BOOKS

1. Matt Doyle, Beginning PHP 5.3, Wunley India Edition, 2012.

REFERENCE BOOKS

1. VikramVaswani, PHP: A Beginners guide, Tata Mc grawHill, Edition2018.
2. Law point, Guide to PHP, Computer series, Edition2017.
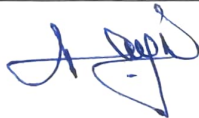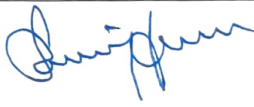3. Larry Ullman, PHP 6 and MySQL 5, Pearson Education, 2008.

MAPPING WITH PROGRAM OUTCOMES

PO-CO	PO1	PO2	PO3	PO4	PO5	PO5	PO6	PO7
CO1	S	M	M	M	M	S	M	M
CO2	M	S	M	M	M	S	S	M
CO3	M	S	M	L	M	S	S	S
CO4	S	M	S	M	S	S	M	S
CO5	S	S	S	M	S	M	M	M

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Dr. N. Revathy) Name & Signature of the Staff	**(Dr. A. V. Senthil Kumar)** Name & Signature	Name & Signature

Course Code	21MCP10	Course Title					Batch	2021-2022 & Onwards
		DATA STRUCTURES AND ALGORITHMS					Semester	II
Hours / Week	5	L	4	T	-	P	-	Credits	4

COURSE OBJECTIVE

1. To study about the basic introductory concepts of Data structures
2. To work with concepts of Linear and Non Linear Data structures
3. To develop applications with Algorithms and its features
4. To evaluate with advanced features of data structures
5. To analyze various optimum techniques

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understanding the concepts of Sorting, Searching and Selection	K2
CO2	Outline the knowledge about Graphs, Backtracking and Branch and Bound Technique	K1
CO3	Apply the basic data structure concepts to create various domains	K3
CO4	Acquire the concepts of Linear Data Structure like Linked List, Matrices and Storage Management	K4
CO5	Analyze the Non - Linear Data Structure like Trees and Graphs	K4

KI - Remember, K2 - Understand, K3 - Apply, K4 - Analyse, K5 –Evaluate

SYLLABUS

21MCP10	DATA STRUCTURES AND ALGORITHMS	Sem: II
Unit No.	Topics	Hours
I	**Data Structure Introduction:** Introduction: Introduction of Algorithms, Analyzing Algorithms. Arrays: Sparse Matrices - Representation of Arrays. Stacks and Queues. Fundamentals –Operation -Application of stack and queue-Evaluation of Expression Infix to Postfix Conversion -Multiple Stacks and Queues - Perform Analyze the Algorithms.	12
II	**Linear Data Structure:** Linked List: Singly Linked List - Linked Stacks and Queues - Polynomial Addition - Sparse Matrices - Doubly Linked List and Dynamic-Storage Management-Garbage Collection and Compaction	12

III	**Non Linear Data Structure: Trees**: Basic Terminology - Binary Trees- Binary Tree Representations - Binary Trees- Traversal - Threaded Binary Trees - Binary Tree - Representation of Trees - Council Binary Trees. Graphs: Terminology and Representations- Traversals, Connected Components and Spanning Trees	13
IV	**Basics of Algorithm and Techniques:** Algorithm - Algorithm Specification - Performance Analysis. Divide - And Conquer: The General Method - Application of Divide and Conquer - Binary Search - Finding Maximum and Minimum - Quick Sort - Merge Sort - Heap Sort-Selection. The Greedy Method: The General Method-Minimum Cost Spanning Trees- Single Source Shortest Paths (Dijkstra"s Algorithm) – Analysis of Algorithm	14
V	**Optimum Techniques:** Dynamic Programming: The General Method - Multistage Graphs - forward approach-backward approach -All Pairs Shortest Paths - Single Source Shortest Paths. Backtracking: The General Method - The 8 Queens Problem -Sum of Subsets - Graph Coloring - Hamiltonian cycle. Branch and Bound Technique - Case Study : Applications of Branch and Bound Technique.	14

Note: Internal – 40, External –60.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

TEXT BOOKS

1. Ellis Horowitz, Sartaj Shani "Fundamentals of Computer Algorithm", Second Edition, Galgotia Publication, 2014.
2. Ellis Horowitz, Sartaj Shani, "Data and File Structures",Galgotia Publication, Second Edition,2013.

REFERENCE BOOKS

1. Ellis Horowitz, Sartaj Shani, SanguthevarRajasekaran," Computer Algorithms",Galgotia Publication,2008
2. Seymour Lipschutz, "Data Structures", Schaum"s Outlines,2010.
3. Jean Paul Tremblay and Paul G.Sorenson, "An Introduction to Data Structures With Applications", Tata McGraw-Hill, Second Edition
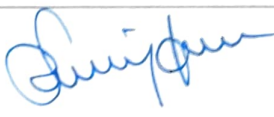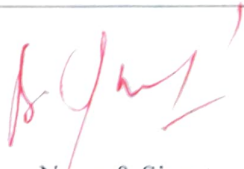
MAPPING WITH PROGRAM OUTCOMES

PO-CO	PO1	PO2	PO3	PO4	PO5	PO5	PO6	PO7
CO1	S	S	S	M	M	S	S	S
CO2	S	S	S	M	M	S	S	S
CO3	S	S	S	M	S	S	S	S
CO4	M	S	S	S	S	S	S	S
CO5	S	M	M	M	M	S	S	S

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Mr. A. Ganesan) Name & Signature of the Staff	(Dr. A. V. Senthil Kumar) Name & Signature	Name & Signature

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science,
Coimbatore 641 028.

Course Code	21MCP11	Course Title					Batch	2021-2022 & Onwards
		NETWORK TECHNOLOGIES					Semester	II
Hours / Week	5	L	4	T	-	P	-	Credits	4

COURSE OBJECTIVE

1. To explore the features if Wireless networks
2. To elaborate the working with Mobile technological layers like Network and Transport
3. To learn about the various architectures of Wireless WAN
4. To extend the features of advanced network technologies like 4G and 5G networks.
5. To analyze about various 4G and 5G networks

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understanding basic concepts of IEEE Standards and Hiper LAN	K1
CO2	Build the concepts of Mobile IP and Mobile Ad-hoc Networks	K3
CO3	Explain about Traditional TCP and Classical TCP improvements	K2
CO4	Acquire the knowledge about 4G, 4.5G and 5G Networks	K4
CO5	Explain the knowledge UMTS, DHCP and HSDPA	K2

KI - Remember, **K2** - Understand, **K3** - Apply, **K4** - Analyse, **K5** - Evaluate

SYLLABUS

21MCP11	NETWORK TECHNOLOGIES	Sem: II
Unit No.	Topics	Hours
I	**WIRELESS LAN:** Introduction-WLAN technologies: Infrared, UHF narrowband, spread spectrum -IEEE802.11: System architecture, protocol architecture, physical layer, MAC layer, 802.11b, 802.11a - Hiper LAN: WATM,BRAN, HiperLAN2 - Bluetooth: Architecture, Radio Layer, Baseband layer, Link manager Protocol, security - IEEE802.16-WIMAX: Physical layer, MAC, Spectrum allocation for WIMAX	12
II	**MOBILE NETWORK LAYER:** Introduction - Mobile IP: IP packet delivery, Agent discovery, tunneling and encapsulation, IPV6- Network layer in the internet- Mobile IP session initiation protocol - mobile ad-hoc	12

	network: Routing, Destination Sequence distance vector, Dynamic source routing	
III	**MOBILE TRANSPORT LAYER:** TCP enhancements for wireless protocols - Traditional TCP: Congestion control, fast retransmit/fast recovery, Implications of mobility - Classical TCP improvements: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective retransmission, Transaction oriented TCP - TCP over 3G wireless networks.	13
IV	**WIRELESS WIDE AREA NETWORK:** Overview of UTMS Terrestrial Radio access network-UMTS Core network Architecture: 3G-MSC, 3GSGSN, 3G-GGSN, SMS- GMSC/SMS-IWMSC, Firewall, DNS/DHCP-High speed Downlink packet access (HSDPA)- LTE network architecture and protocol.	14
V	**4G NETWORKS:** Introduction - 4G vision - 4G features and challenges - Applications of 4G - 4G Technologies: Multicarrier Modulation, Smart antenna techniques, OFDM-MIMO systems, Adaptive Modulation and coding with time slot scheduler, Cognitive Radio. 4.5G Introduction– Features – Differences between 4G and 4.5G – Network Sniffer. **5G NETWORKS:** Introduction - Architecture - Advantages & Disadvantages - Challenges - Application Areas - Performance – Deployment – 5G Devices – Technology.	14

Note: Internal – 40, External –60.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

TEXT BOOKS

1. Simon Haykin , Michael Moher, David Koilpillai, "Modern Wireless Communications", First Edition, Pearson Education2013.
2. Jochen Schiller, ""Mobile Communications", Second Edition, Pearson Education2012.

REFERENCE BOOKS

1. Erik Dahlman, Stefan Parkvall,Johan Skold, "5G NR: The Next Generation Wireless Access Technology", Second Edition, Academic Press,2018
2. Erik Dahlman, Stefan Parkvall, Johan Skold and Per Beming, "3G Evolution HSPA and LTE for Mobile Broadband", Second Edition, Academic Press, 2008.
3. Anurag Kumar, D.Manjunath, Joy kuri, "Wireless Networking", First Edition, Elsevier2011
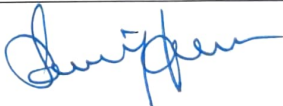4. Vijay Garg , "Wireless Communications and networking", First Edition, Elsevier2007

MAPPING WITH PROGRAM OUTCOMES

PO/CO	PO1	PO2	PO3	PO4	PO5	PO5	PO6	PO7
CO1	S	S	M	M	M	S	S	S
CO2	S	M	M	M	M	M	S	S
CO3	S	S	M	S	M	M	M	S
CO4	S	S	S	M	S	S	M	S
CO5	S	S	S	S	S	M	M	S

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Mrs. B. Sathyabama) Name & Signature of the Staff	**(Dr. A. V. Senthil Kumar)** Name & Signature	Name & Signature

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science
Coimbatore-641 028.

Course Code	21MCP12	Course Title					Batch	2021-2022 & Onwards
		SOFTWARE DEVELOPMENT FUNDAMENTALS##					Semester	II
Hours / Week	4	L	4	T	-	P	-	Credits	4

COURSE OBJECTIVE

1. To learn about the Core and Object oriented securities during the Software development process
2. To summarize the Software development applications and its specifications
3. To elaborate the concepts of Web and Desktop applications of software development
4. To analyze with the storage applications using Query methods
5. To analyze about real time applications

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand the basic concepts of programming such as Storage, data type, decision making and Iterative statements.	K2
CO2	Gathering knowledge on the Object oriented Programming concepts.	K2
CO3	Outline the knowledge about Software development concepts.	K1
CO4	Analyze the knowledge about web page development tools.	K4
CO5	Examine the knowledge on storing data on secondary storage devices	K3

KI - Remember, K2 - Understand, K3 - Apply, K4 - Analyse, K5 –Evaluate

SYLLABUS

21MCP12	SOFTWARE DEVELOPMENT FUNDAMENTALS##	Sem: II
Unit No.	Topics	Hours
I	**Understanding Core Programming:** Understand Computer Storage and Data Types- Understand Computer Decision Structures – Identify the Appropriate Method for Handling Repetition - Understand Error Handling.	8
II	**Understanding Object-Oriented Security Layers:** Understand the Fundamentals of Classes - Understand Inheritance - Understand Polymorphism - Understand Encapsulation.	8

III	**Understanding General Software Development:** Understand Application Life Cycle Management – Interpret Application Specifications – Understand Algorithms and Data Structures.	9	
IV	**Understanding Web Applications:** Understand Webpage Development – Understand Microsoft ASP.NET - MVC Web Application Development - Understand Web Hosting - Understand Web Services.	9	
V	**Understanding Desktop Applications:** Understand Windows Store Applications – Understand Console-based Applications - Understand Windows Services. **Understanding Databases:** Understand Relational Database Management Systems - Understand Database Query Methods - Understand Database Connection Methods.	9	

Note: Internal – 50, External – 50.

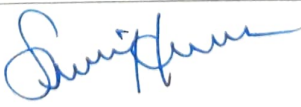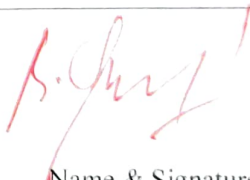**Teaching Methods:** Lecturing, PowerPoint Projection through LCD, Assignment.

MAPPING WITH PROGRAM OUTCOMES

PO CO	PO1	PO2	PO3	PO4	PO5	PO5	PO6	PO7
CO1	S	S	M	L	M	S	S	M
CO2	S	S	M	M	M	S	S	M
CO3	S	M	S	M	M	S	M	M
CO4	S	M	S	M	S	S	M	M
CO5	S	M	S	S	S	S	S	M

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
Dr. V KAVITHA Name & Signature of the Staff	**(Dr. A. V. Senthil Kumar)** Name & Signature	Name & Signature

Course Code	21MCP13	Course Title		Batch	2021-2022 & Onwards
		ELECTIVE II : (A) NEURAL NETWORKS		Semester	II
Hours / Week	4	L	4	T	-	P	-	Credits	3

COURSE OBJECTIVE

1. To learn about the basic functions of Neural networks
2. To explore the architectures of Neural networks and its developing algorithms
3. To illustrate the concepts of fuzzy logic in Neural network
4. To work with the features of real time applications
5. To analyze about various Neural Network and Fuzzy applications

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand the Neural Networks Algorithms and Fuzzy logic Techniques	K2
CO2	Outline about the fuzzy logic and neural network techniques to build intelligent machines	K1
CO3	Apply neural network and fuzzy logic models to handle uncertainty and solve problems	K3
CO4	Gathering the feasibility of applying neuro fuzzy models for a particular problem	K2
CO5	Determine and implement machine learning solutions to evaluate and interpret results of an algorithm	K3

KI - Remember, K2 - Understand, K3 - Apply, K4 - Analyse, K5 –Evaluate

SYLLABUS

21MCP13	ELECTIVE II : (A) NEURAL NETWORKS	Sem: II
Unit No.	Topics	Hours
I	**Structures of Neural Network:** Introduction – Principles and Promises – Perception Representation – Linear Separability – Learning – Training Algorithm – Back Propagation – Training Algorithm – Applications – Counter Propagation networks – Network Structure – Application.	10
II	**Neural Network Architecture:** Adaptive Resonance Theory – Overview – Architecture – Classification – Implementation – Optical Neural Network – Holographic Correlators – Cognition and Neo cognition – Structure– Training.	10

III	**Neural Network Algorithm:** Statistical Methods – Boltzmann''s Training – Cauchy Training – Cauchy Training – Cauchy Training Hopfield Nets – Associative Memory – Applications	11
IV	**Fuzzy Logic in Neural Network:** Fuzzy Sets: Classical Sets to Fuzzy Sets, Fuzzy Sets Versus CRISP Sets – Operations on Fuzzy Sets – Fuzzy Arithmetic and Fuzzy Relations. Fuzzy Logic – Applications	10
V	**Case Study:** Application of Neural Networks in Character Recognition, Drug Discovery, Speech Recognition; Application of Fuzzy Logic Concepts in Fuzzy Controller Design and Fuzzy Querying in Relational Database Model.	11

Note: Internal – 40, External –60.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

TEXT BOOKS

1. Philip D.Wasserman, "Neural Computing Theory and Practice", Anza Research Van Nostrand Reinhold, New York2018.

REFERENCE BOOKS

1. George J. Klirand Bo Yuan, "Fuzzy sets and Fuzzy logic – Theory and Applications", PHI 2014.
2. Beale R. and Jackson T, "Neural Computing an Introduction", Adam Hilger,2015
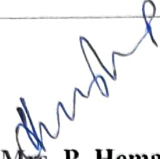3. Igor Aleksander and Helen Morton, "An Introduction to Neural Computing", Chapman &Hall, 2016

MAPPING WITH PROGRAM OUTCOMES

PO CO	PO1	PO2	PO3	PO4	PO5	PO5	PO6	PO7
CO1	S	S	M	L	M	M	S	S
CO2	S	S	M	M	M	M	S	S
CO3	S	M	S	M	M	S	M	S
CO4	S	M	S	M	S	M	M	S
CO5	S	M	S	S	S	M	S	S

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Mrs. P. Hemashree) Name & Signature of the Staff	**(Dr. A. V. Senthil Kumar)** Name & Signature	Name & Signature

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science,
Coimbatore-641 028.

Course Code	21MCP13	Course Title		Batch	2021-2022 & Onwards
		ELECTIVE II : (B) BLOCK CHAIN TECHNOLOGIES		Semester	II
Hours / Week	4	L	4	T	-	P	-	Credits	3

COURSE OBJECTIVE

1. To summarize the foundations and basic concepts of Block chain
2. To illustrate block chain concepts with Big data techniques
3. To study about the Security and precautionary methods using Bitcoins
4. To explore the block chain concepts with various tools and its applications
5. To analyze about various Block chain platforms with its applications

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand the neediness of Block chaining and its types, Requirement	K2
CO2	Interpret about the Block chain technology and its architecture	K2
CO3	Experimenting Block Chain with Mining Tools	K3
CO4	Analyze security key management. Creation and exchange of Bitcoins.	K4
CO5	Evaluate the platforms and Applications of Block chain	K5

KI - Remember, K2 - Understand, K3 - Apply, K4 - Analyse, K5 - Evaluate

SYLLABUS

21MCP13	ELECTIVE II : (B) BLOCK CHAIN TECHNOLOGIES	Sem: II
Unit No.	Topics	Hours
I	**Block chain Technology:** History of centralized service-Trusted third party for Transaction – Difference between centralized ,decentralized and distributed peer-to- peer networks – needs of block chaining, decentralized transaction – types of block chaining – History of bitcon – problem area of bitcon - Requirements for block chaining in business environment.	10
II	**Fundamental Concepts:** Over view of block chain technology – Block – verify and confirm block – Hashes –hash cryptography – Encryption vs hashing – Transaction: recording transaction, digital signature – verifying and confirming transaction – Block and block chaining – Hash pointers –	10

		block consensus building - Distributed consensus, Byzantine generals problem, Consensus mechanisms: POW, POS, POB, POA, POET, etc., Blockchain Architecture, Markle Root Tree, blockchain and future world of web3.0.	
III		**Mining and Simulating Blockchain:** Mining and simulating blockchain: Game theory behind competitive mining, Race to beat the others (including hackers), Incentives-mining and transactions fees, CPU considerations, Energy expended in mining, Profitability Mining tools, Blockchain for Bigdata.	11
IV		**Bitcoins, Security and Safeguard Bitcoin:** Bitcoin creation and economy, Bitcoin exchanges, Bitcoin limited supply and deflation? famous hacks, Wallets, Security and safeguards: Protecting blockchain from attackers, Forks-soft and hard, Blockchain Security Key Management in Bitcoin, Case Studies.	11
V		**Platforms and Applications:** Introduction to Blockchain platform: Ethereum, Hyperledger, IOTA, EOS, Multichain, Bigchain, CORDA, Openchain, SOLIDITY, Design a new blockchain, potential for disruption, How to Government, Identity management, Auto executing contracts, Three signature escrow, Triple entry accounting, Elections and voting?, Property records, titles, Micropayments, Notary, Sidechains, Blockhain Smart Contracts, Challenges and Research Issues in Blockchain.	11

Note: Internal – 40, External –60.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

TEXT BOOKS

1. Blockchain Basics 2019: The New Updated Invested Paperback, by Bradley Lakeman
2. Bitcoin and Cryotocurrency Technologies: A Comprehensive Introduction, Arvind Narayana.

REFERENCE BOOKS

1. Blockchain: Step-By-Step Guide to Understand by Paul Laurence.
2. Introducing Ethereum and Solidity Foundations of Cryotocurrency and Blockchain Programming for Begnners by Chirs Dannen, Apress.
3. Hands-On Blockchain for Python Developers: Gain blockchain programming skill to build decentralized applications using Python Paperback.
4. Building Blockchain Projects (English, Paperback, Prusty Narayan, Packt.

5. Blockchain: The comprehensive beginner? sig id,(Paperback), by frankwaltin.

6. Ultimate Blockchain Technology Mega Edition-Six Books-Best Deal for Beginners in Blockchain, Blockchain Applications, Cryotocurrency, Bitcoin, Mining and Investing by Lee Sebastian.

7. Blockchain and Decentralized Systems (Paperback) by Pavel Kravchenko, Bohdan Skrabin.

8. Masters of Blockchain, Digital Assets &the New Paperback, by Andrew Romans Tim Draper.

MAPPING WITH PROGRAM OUTCOMES

PO CO

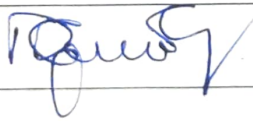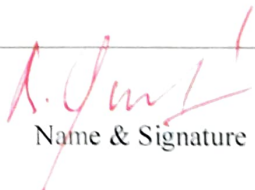|								
CO1	S	S	M	L	S	S	M	M
CO2	S	M	M	M	M	S	S	M
CO3	S	M	S	S	M	M	M	S
CO4	S	M	S	M	M	S	M	M
CO5	S	M	S	M	M	M	S	M

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Mr. A.Ganesan) Name & Signature of the Staff	**(Dr. A. V. Senthil Kumar)** Name & Signature	Name & Signature

Course Code	21MCP13			Course Title			Batch	2021-2022 & Onwards
				ELECTIVE II : (C) DATA SCIENCE			Semester	II
Hours / Week	4	L	4	T	-	P	-	Credits	3

COURSE OBJECTIVE

1. To explain the basic concepts and background process of Data science
2. To extract the applications with data science methods
3. To work with the features of Map reduce, Pregel and Hadoop
4. To summarize advanced data with real time applications
5. To analyze about various real time data sources

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand the basic concepts of Data science	K2
CO2	Gather knowledge on the Univariate Analysis	K2
CO3	Outline the knowledge about Prescriptive, Predictive and bivariate analysis	K1
CO4	Illustrate about the Bi-Variate Analysis	K4
CO5	Evaluate the concepts of Data science in real time applications	K4

KI - Remember, K2 - Understand, K3 - Apply, K4 - Analyse, K5 –Evaluate

SYLLABUS

21MCP13	ELECTIVE II : (C) DATA SCIENCE	Sem: II
Unit No.	Topics	Hours
I	**Data Science Introduction:** Getting Started with Data Science – What makes someone a Data Scientist – Beyond the Big Data type – Datafication – Data science jobs – Data Science profile – Statistical thinking in the Age of Big data – Exploratory Data Analysis – The data science process	10
II	**Origins:** Data Collection, Preparation and Reporting - Clustering: Data Ordering and Visualization - Sharing: Data access, Dissemination and Quality Assessment - Interpreting: Data Transformation - Interpreting: Data Transformation - Analysis and Reuse The Reuse of Digital Computer Data: Transformation - Recombination and Generation of Data Mixes in Big Data	10

	Science - Analysis and Reuse	
III	**Extracting Meaning from Data:** The Kaggle Model – A single contestant – Their customers – Feature Selection – Filters – Wrappers- Embedded Methods Tree Algorithm – Entropy – Decision tree Algorithm - Handling Continuous variables in decision trees – Random Forests – David Huffaker : Google"s Hybrid Approach to Social Research – Moving from Descriptive toPredictive – Social at Google	11
IV	**Data Engineering : Map Reduce, Pregel and Hadoop:** Map Reduce – World Frequency Problem – Pregel – On being a data scientist- Data Abundance verses Data Scarcity – Designing Models – Economic Intrlude: Hadoop – A brief Introduction to Hadoop –Cloudera	10
V	**Data Sources** – Data Types – Data at scale - „Big" Clinical Data: The Four „Vs" - Standards in Healthcare Data - Research Data Stewardship for Healthcare Professionals - Extracting Features from Time Series.	11

Note: Internal – 40, External –60.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

TEXT BOOKS

1. Levin, Rubin, (2013), Statistics for Management, 13th edition, Pearson Education.
2. Anderson D.R, Sweeney D.J, Williams T.A, (2013), Statistics for Business and Economics, 11th edition, Cengage Learning.
3. Pieter Kubben Michel Dumontier Andre Dekker (2019), Fundamentals of Clinical Data Science, Springer Open.
4. Sabina Leonelli Niccolò Tempini, Data Journeys in the Sciences, Springer Open.

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1. Gerald Keller, (2014), Statistics for Management and Economics, 10thedition,
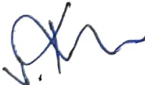2. Cengage Learning. RajendraNargunkar (2016), Marketing Research, Tata McGrawHill

MAPPING WITH PROGRAM OUTCOMES

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	S	S	M	L	M	S	S	S
CO2	M	S	M	M	M	S	M	S
CO3	M	M	S	M	S	S	S	S
CO4	M	M	S	S	S	M	S	S
CO5	S	M	M	S	M	S	S	S

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Dr.V. Kavitha) Name & Signature of the Staff	(Dr. A. V. Senthil Kumar) Name & Signature	Name & Signature

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science,
Coimbatore-641 028.

Course Code	21MCP13	Course Title					Batch	2021-2022 & Onwards
		ELECTIVE II : (D) EMBEDDED SYSTEMS					Semester	II
Hours / Week	4	L	4	T	-	P	-	Credits	3

COURSE OBJECTIVE

1. To learn about the concepts of Embedded systems
2. To extract the basic knowledge of embedded platforms with computing designs
3. To apply the interfacing concepts with Arduino systems
4. To work with Programming structures and its firmware technology
5. To analyze concepts of delay & timeout mechanisms

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Understand the basic concepts of Embedded Computing.	K2
CO2	Gather the knowledge on the Embedded Computing Platform Design	K2
CO3	Analyze the knowledge about Sensor Interfacing with Arduino	K4
CO4	Illustrate about the Embedded Firmware	K4
CO5	Evaluate the concepts of Generating delay, Timeout mechanisms	K5

KI - Remember, K2 - Understand, K3 - Apply, K4 - Analyse, K5 - Evaluate

SYLLABUS

21MCP13	ELECTIVE II : (D) EMBEDDED SYSTEMS	Sem: II
Unit No.	Topics	Hours
I	**Introduction to Embedded Computing and Arm Processors:** Complex systems and microprocessors– Embedded system design process –Design example: Model train controller- Instruction sets preliminaries - ARM Processor – CPU: programming input and output- supervisor mode, exceptions and traps – Co-processors- Memory system mechanisms – CPU performance- CPU power Consumption.	10
II	**Embedded Computing Platform Design:** The CPU Bus - Memory devices and systems – Designing with computing platforms consumer electronics architecture – platform- level performance analysis - Components for embedded programs- Models of programs- Assembly, linking and loading -	11

		compilation techniques- Program level performance analysis – Software performance optimization – Program level energy and power analysis and optimization – Analysis and optimization of program size - Program validation and testing.	
III		**Sensor Interfacing with Arduino:** Basics of hardware design and functions of basic passive components- sensors and actuators- Arduino code - library file for sensor interfacing-construction of basic applications	10
IV		**Embedded Firmware:** Reset Circuit, Brown-out Protection Circuit-Oscillator Unit - Real Time Clock-Watchdog Timer - Embedded Firmware Design Approaches and Development Languages.	10
V		**Embedded C Programming:** Introduction-Creating - hardware delays using Timer 0 and Timer 1- Reading switches-Adding Structure to the code-Generating a minimum and maximum delay-Example: Creating a portable hardware delay- Timeout mechanisms-Creating loop timeouts-Testing loop timeouts- hardware timeouts-Testing a hardware timeout	11

Note: Internal – 40, External –60.

Teaching Methods: Lecturing, PowerPoint Projection through LCD, Assignment.

TEXT BOOKS

1. Marilyn Wolf - Computers as Components - Principles of Embedded Computing System Design‖, Third Edition - Morgan Kaufmann Publisher (An imprint from Elsevier), 2012.

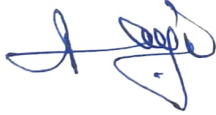2. Michael J. Pont - Embedded C‖, 2nd Edition, Pearson Education, 2018.

WEB REFERENCE

1. https://www.coursera.org/learn/interface-with-arduino#syllabus

MAPPING WITH PROGRAM OUTCOMES

PO\CO	PO1	PO2	PO3	PO4	PO3	PO5	PO6	PO7
CO1	S	S	M	M	M	S	S	M
CO2	M	S	M	M	M	S	M	M
CO3	S	M	S	M	S	S	M	S
CO4	S	S	S	S	S	S	M	M
CO5	M	M	M	M	M	S	M	M

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Dr.N. Revathy) Name & Signature of the Staff	(Dr. A. V. Senthil Kumar) Name & Signature	Name & Signature

Co-ordinator
Curriculum Development Cell
Hindusthan Col... & Science,
Coimb... 28.

Course Code	21MCP14	Course Title					Batch	2021-2022 & Onwards
		PRACTICAL III – PHP AND MySQL PROGRAMMING LAB					Semester	II
Hours / Week	5	L	-	T	-	P 5	**Credits**	3

COURSE OBJECTIVE

1. To develop the simple programs using basic concepts and functions of PHP
2. To work with Arrays ,HTML forms with PHP
3. To execute the applications using MySQL concepts
4. To analyze and working with some real time applications
5. To develop complex real time applications using PHP & MySQL

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Implement the Calculator program and Implement the Factorial Calculation	K3
CO2	Identification of web form using HTML and PHP	K1
CO3	Execute the database using MySQL and Implementation of record insertion and deletion operations	K3
CO4	Estimate the application to implement Hospital management	K2
KI - Remember, **K2** - Understand, **K3** - Apply, **K4** - Analyse, **K5** - Evaluate		

SYLLABUS

21MCP14	PRACTICAL III – PHP AND MySQL PROGRAMMING LAB	Sem: II
Unit No.	**Topics**	**Hours**
	1. Write a program to build a factorial calculator.	3
	2. Write a program for Interactive HTML color sampler.	4
	3. Design a HTML page and write a program for arithmetic operation in PHP using switch case.	4
	4. Design & write a program to calculate average and grade of a class using arrays.	4
	5. Write a program to manipulate string using different types of string function in PHP	4
	6. Design and write a program to calculate age in years, months and days from the date of birth in PHP.	4
	7. Write a program to access multi-dimensional array.	3

8. Create a web form in HTML that contain variety of form fields and display the values using PHP.	5
9. Design a web page and write a program to find number of hits in a webpage.	5
10.Create employee database using mysql, insert records and display in neat format.	5
11.Design a login authentication system using PHP.	5
12.Design an online resume submission form using PHP.	6
13.Create a student mark list using PHP.	6
14.Write a PHP program to display patient details in a hospital.	7
15.Write a PHP program to display book details in a library.	7

Note: Internal – 50, External – 50.
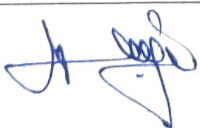
Teaching Methods: Demonstrating using LCD

MAPPING WITH PROGRAM OUTCOMES

PO\CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	S	M	L	S	S	M
CO2	M	S	M	M	S	S	M
CO3	S	M	S	M	S	M	M
CO4	S	S	S	M	S	S	M

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Dr. N. Revathy) Name & Signature of the Staff	(Dr. A. V. Senthil Kumar) Name & Signature	Name & Signature

Course Code	21MCP15	Course Title PRACTICAL IV – DATA STRUCTURES LAB					Batch	2021-2022 & Onwards
							Semester	II
Hours / Week	5	L	-	T	-	P	5	Credits	3

COURSE OBJECTIVE

1. To develop basic programming using Searching techniques
2. To develop basic programming using Sorting techniques
3. To work with concepts of Mathematical models like ADT and Traversal concepts
4. To develop algorithmic application using various Tree concepts
5. To analyze real time applications

COURSE OUTCOMES (CO)

S. No	Course Outcome	Blooms Level
CO1	Experiment the various Searching operations.	K3
CO2	Implementing Stack and Queue with its operation.	K3
CO3	Estimate the performance of addition, deletion of a node in non-linear Data structure.	K4
CO4	Solve a program to implement various types of Sorting.	K5

KI - Remember, **K2** - Understand, **K3** - Apply, **K4** - Analyse, **K5** - Evaluate

SYLLABUS

21MCP15	PRACTICAL IV – DATA STRUCTURES LAB	Sem: II
Unit No.	Topics	Hours

	1. Write a program to implement recursive and non-recursive
	    i) Linear search
	    ii) Binary search.
		10

	2. Write a program to implement
	    i) Bubble sort
	    ii) Selection sort
	    iii) Quick sort
	    iv) Insertion sort
		12

	3. Write a program to implement the following using an array.
	    i) Stack ADT
	    ii) Queue ADT
		10

4. Write a program to implement list ADT to perform following
    i) Insert an element into a list.
    ii) Delete an element from list
    iii) Search for a key element in list
    iv) Count number of nodes in list
	10

5. Write a program that use recursive functions to traverse the given binary tree in
    i)   Pre-order
    ii)   In-order and
    iii)   Post-order.
	10

6. Write a program for binary tree creation, addition, deletion and display the node.	10
7. Write a program to find minimum cost of spanning tree using kruskal's method.	10

Note: The above said programs can be developed using C or C++ or in Java Programming.

Note: Internal – 50, External – 50.

Teaching Methods: Demonstrating using LCD

MAPPING WITH PROGRAM OUTCOMES

PO\CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M	S	M	S	S	S
CO2	S	S	M	M	S	S	S
CO3	S	M	S	L	S	S	S
CO4	S	S	S	S	S	S	S

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Coordinator
(Mr. A. Ganesan) Name & Signature of the Staff	(Dr. A. V. Senthil Kumar) Name & Signature	Name & Signature