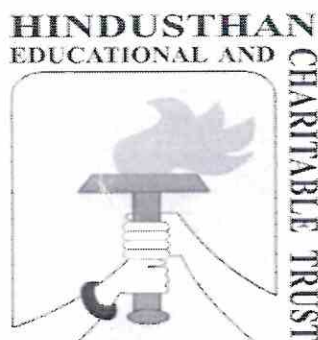


**LEARNING OUTCOMES – BASED CURRICULUM  
FRAMEWORK (LOCF)**

in the

**UNDERGRADUATE PROGRAMME  
B.Sc Computer Technology**

**FOR THE STUDENTS ADMITTED FROM THE  
ACADEMIC YEAR 2020 - 2021**



**HICAS**

**HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)**

**(Affiliated to Bharathiar University and Accredited by NAAC)**

**COIMBATORE-641028**

**TAMILNADU, INDIA.**

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# **DEPARTMENT OF COMPUTER TECHNOLOGY**

## **PREAMBLE**

Learning Outcomes–Based Curriculum Framework (LOCF) in the Undergraduate Programme  
B.Sc Computer Technology.

## **VISION**

To create professionally competent and socially responsible graduates capable to face challenges in global environment.

## **MISSION**

- To provide a strong theoretical and practical background in the field of Computer Technology.
- To impart the skills necessary to continue education to grow professional.
- To inculcate professional behavior, strong ethical values, innovative research capabilities and leadership abilities.

## **PROGRAMME EDUCATIONAL OBJECTIVES (PEO)**

Under Graduates of Computer Technology program will

**PEO1 :** provide solutions to challenging problems in their profession by applying computer science theory and principles

**PEO2 :** engage in life-long learning and professional development to adapt to rapidly changing work environment

## **PROGRAM OUTCOME (PO) :**

**PO1 :** Having ability to apply knowledge of computing and mathematics appropriate to the discipline.

**PO2 :** Recognition of the need for and ability to engage in continuing professional development.

**PO3 :** Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

**PO4 :** Function effectively as a member or leader of a team engaged in activities appropriate to the computer technology discipline

## **PROGRAM SPECIFIC OUTCOME (PSO):**

**PSO1 :** Ability to apply the knowledge of computing mathematics and related concepts in the appropriate domain.

**PSO2 :** Ability to analyze a problem, identify and define the requirements necessary for its solution.

**PSO3 :** Ability to use current techniques, skills and tools to develop for application development with Professional ethics.

UG PROGRAMME

Programme: B.Sc Computer Technology

Part	Course Code	Course Type	Course Title	Lecture Hours/ Week	Exam Duration (hours)	MAX. MARKS			CREDIT POINTS
						I.E	E.E	TOTAL	
<b>Semester - I</b>									
I	20LAT01/ 20LAH01/ 20LAM01/ 20LAF01	MIL	Tamil-I/ Hindi-I/ Malayalam – I/ French-I	6	3	30	70	100	3
II	20ENG01	AECC	English – I	6	3	30	70	100	3
III	20CTU01	DSC	Fundamentals of Computing and C Programming	5	3	30	70	100	5
III	20CTU02	DSC	Computer System Architecture	4	3	30	70	100	4
	20CTIU02		Software Foundation Program Using C++			40	60	100	
III	20CTU03	GE	Allied: Mathematics for Computing	5	3	30	70	100	4
III	20CTU04	DSC	Practical - I : Programming using C	4	3	40	60	100	2
IV	20CTUV01	ACC	VAC-I	2	1	50	-	50	Grade*
IV	20CTUJ01	AEE	Communicative Skills	2	1	50	-	50	Grade*
IV	20CTUJ02	AEE	Soft skill	2	1	50	-	50	Grade*
<b>Semester – II</b>									
I	20LAT02/ 20LAH02/ 20LAM02/ 20LAF02	MIL	Tamil-II/ Hindi-II/ Malayalam-II/ French-II	6	3	30	70	100	3
II	20ENG02	AECC	English – II	6	3	30	70	100	3
III	20CTU05	DSC	Data Structures and Algorithms	4	3	30	70	100	3
	20CTIU05		Data Visualization			40	60	100	
III	20CTU06	DSC	Python Programming	3	3	30	70	100	3
III	20CTU07	GE	Allied : Numerical Methods	5	3	30	70	100	4
III	20CTU08	DSC	Practical - II : Programming using Python	4	3	40	60	100	2
IV	20GSU01	AECC	Value Education – Human Rights	2	2	100	-	100	2
IV	20CTUV02	ACC	VAC-II	2	1	50	-	50	Grade*



IV	20CTUJ03	AEE	Communicative Skills	2	1	50	-	50	Grade*
IV	20CTUJ04	AEE	Soft Skill	2	1	50	-	50	Grade*
<b>Semester – III</b>									
III	20CTU09	DSC	Database Management System	5	3	30	70	100	5
III	20CTU10	DSC	Computer Networks	5	3	30	70	100	5
III	20CTU11	DSC	PC Hardware and Troubleshooting	4	3	30	70	100	4
	20CTIU11		Design Thinking			40	60		
III	20CTU12	GE	Allied: Business Accounting	5	3	30	70	100	4
III	20CTU13	DSC	Practical -III: DBMS Applications	6	3	40	60	100	3
III	20CTU14	SEC	Practical -IV: Networking	3	3	40	60	100	2
IV	20GSU02	AECC	Environmental Studies	2	2	100	-	100	2
IV	20CTUV03	ACC	VAC-III	2	1	50	-	50	1
IV	20CTUJ05	SEC	Aptitude / Placement Training	2	1	50	-	50	Grade*
IV	20CTUJ06	SEC	Online Classes	2	1	-	-	-	C/NC**

<b>Semester – IV</b>									
III	20CTU15	DSC	JAVA Programming	6	3	30	70	100	6
III	20CTU16	DSC	LINUX and Shell Programming	6	3	30	70	100	6
	20CTIU16		Business Intelligence			40	60		
III	20CTU17	DSC	Practical - V : Programming using JAVA	6	3	40	60	100	3
III	20CTU18	GE	Allied : Operations Research	5	3	30	70	100	4
III	20CTU19	SEC	Practical - VI : Web Technology	5	3	40	60	100	3
IV	20GSU03	AECC	<u>Skill Based Subject</u> Internet Security	2	2	100	-	100	2
V	20GSU04	AECC	Extension Activity	-	-	100	-	100	Grade*
IV	20CTUV04	ACC	VAC-IV	2	1	50	-	50	1
IV	20CTUJ07	SEC	Aptitude / Placement Training	2	1	50	-	50	Grade*
IV	20CTUJ08	SEC	Online Classes	2	1	-	-	-	C/NC**

<b>Semester – V</b>									
III	20CTU20	DSC	.NET Programming	6	3	30	70	100	5
III	20CTU21	DSC	Big Data Analytics	6	3	30	70	100	5
	20CTIU21		Data Science			40	60		
III	20CTU22	DSC	Practical - VII: Programming using .NET	6	3	40	60	100	3
III	20CTU23A	DSE	Elective I : Cloud Computing (OR)	6	3	30	70	100	5
	20CTU23B		Elective I : Soft Computing (OR)						
	20CTU23C		Elective I : Mobile Computing						
III	20CTU24	SEC	Practical - VIII :Data Analytics	6	3	40	60	100	3
	20CTIU24		Predictive Modelling						
IV	20GSU05	AECC	Non-Major Elective	-	2	100	-	100	2

			General Awareness						
V	20GSU06	AECC	Law of Ethics	-	2	100	-	100	2
IV	20CTUV05	ACC	VAC-V	2	1	50	-	50	1
IV	20CTUJ09	SEC	Aptitude / Placement Training	2	1	50	-	-	Grade*
IV	20CTUJ10	SEC	Online Classes	2	1	-	-	-	C/NC**
<b>Semester – VI</b>									
III	20CTU25	DSC	Open Source Tools	5	3	30	70	100	5
III	20CTU26A	DSE	Elective II :Software Testing (OR)	5	3	30	70	100	5
	20CTU26B		Elective II : Computer Installation & Servicing (OR)						
	20CTU26C		Elective II :Artificial Intelligence and Expert Systems						
III	20CTU27	DSC	Practical - IX : Open Source Tools	6	3	40	60	100	3
III	20CTU28A	DSE	Elective III :Computer Graphics and Multimedia (OR)	5	3	30	70	100	5
	20CTU28B		Elective III :Compiler Design (OR)						
	20CTU28C		Elective III : Neural Networks						
III	20CTU29	SEC	Practical - X :Software Testing Tools	5	3	40	60	100	3
III	20CTU30	DSC	Project Work	4	-	40	60	100	4
IV	20CTUV06	ACC	VAC-VI	2	1	50	-	50	1
IV	20CTUJ11	SEC	Aptitude / Placement Training	2	1	50	-	-	Grade*
IV	20CTUJ12	SEC	Online Classes	2	1	-	-	-	C/NC**
<b>Credits Grand Total</b>									<b>144</b>

- VAC-Value Added Course (Extra Credit Courses)
- \* Grades depends on the marks obtained

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
- JOC-Job Oriented Course
- C/NC\*\* -Completed/ Not Completed

### PASSING MINIMUM

- Passing Minimum for UG 40% and for PG 50 %
- For UG : 35 % (25 marks) in EE and 40 % in Total Marks
- For PG 50 % (35 marks) in EE and 50 in Total Marks

List of Open Elective Papers	
Open Electives	Courses offered by the Departments (Additional Credit Courses)
	A. Animation Techniques
	B. Digital Marketing
	C. Mongo Db
	D. PHP Programming
	E. Block Chain Technology
	F. Multimedia And Its Applications
	G. E Learning
	H. Network Administration & Troubleshooting
	I. VM Ware
J. Project Management	

<b>List of Elective Papers/ DSE</b>		
<b>(Can choose any one of the paper as electives)</b>		
	Course Code	Title
<b>DSE-I</b>	<b>20CTU23A</b>	<b>Elective I :Cloud Computing (OR)</b>
	<b>20CTU23B</b>	<b>Elective I : Soft Computing (OR)</b>
	<b>20CTU23C</b>	<b>Elective I : Mobile Computing</b>
<b>DSE-II</b>	<b>20CTU26A</b>	<b>Elective II :Software Testing (OR)</b>
	<b>20CTU26B</b>	<b>Elective II : Computer Installation &amp; Servicing (OR)</b>
	<b>20CTU26C</b>	<b>Elective II :Artificial Intelligence and Expert Systems</b>
<b>DSE-III</b>	<b>20CTU28A</b>	<b>Elective III :Computer Graphics and Multimedia (OR)</b>
	<b>20CTU28B</b>	<b>Elective III :Compiler Design (OR)</b>
	<b>20CTU28C</b>	<b>Elective III :Neural Networks</b>



ABSTRACT FOR SCHEME OF EXAMINATIONS

(For the Candidates admitted during the academic year 2020 - 2021 and onwards)

S.No.	Part	Course (MIL/AECC/AEE/DS C/DSE/SEC/GE/ACC)	Papers	Credit	Total Credits	Marks	Total Marks
1	Part I	MIL	2	3	6	100	200
2	Part II	AECC	2	3	6	100	200
3	Part III	DSC	19	2/3/4/5	76	100	1900
		GE	4	4	16	100	400
		DSE	3	5	15	100	300
		SEC	4	2/3	11	100	400
4	Part IV	ACC	6	1	4	50	300
		SEC	8	-	-	50	100
		AEE	4	-	-	50	200
		AECC	4	2	8	100	400
5	Part V	AECC	2	2	2	100	200
		Total	58	-	144	950	4600

## UG Courses- Scheme of Evaluation (Internal & External Components)

(For the students admitted during the academic year 2020-2021 and onwards)

### 1. Internal Marks for all UG

Components	Marks
Test I	5
Test II	5
Model Exam	10
Assignment	5
Attendance*	5
<b>TOTAL</b>	<b>30</b>

#### \*Split-up of Attendance Marks

- ♣ 75-79 - 1 marks
- ♣ 80-84 - 2 marks
- ♣ 85-89 - 3 marks
- ♣ 90-94 - 4 marks
- ♣ 95-100 - 5 marks

### 2. a) Components for Practical I.E.

Components	Marks
Test -I	20
Test - II	20
<b>Total</b>	<b>40</b>

### b) Components for Practical E.E.

Components	Marks
Experiments	50
Record	5
Viva	5
<b>Total</b>	<b>60</b>

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

Institutional /Industrial Training (I.E)		Mini Project (I.E)	Major Project Work		
Component	Marks	Marks	Component	Marks	Total Marks
Work diary	25	-	I.E		
Report	50	50	a)Attendance	10	
Viva-voce	25	50	b)Review/Work diary*	30	40
<b>Total</b>	<b>100</b>	<b>100</b>	E.E**:	a) Final report	40
				b)Viva-voce.	20
				<b>Total</b>	<b>100</b>

\*Review is for Individual Project and Work Diary is for Group Projects  
(group consisting of minimum 3 and maximum 5)

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

### 4. Components for Value Education (Part IV):

S.No.	Components	Marks
a)	Attendance 96% and above - 30 marks 91% to 95% - 25 marks 86% to 90% - 20 marks 76% to 85% - 10 marks	30 marks
b)	Participation in group activity	30 marks
c)	Assignment (2 x 10)	20 marks
d)	Test (1 hr for 20 marks) 2 out of 3 questions, 10 marks each	20 marks
	<b>Total</b>	<b>100 marks</b>

## UG Courses- Scheme of Evaluation (Internal & External Components)

(For the students admitted during the academic year 2020-2021 and onwards)

### 1. Internal Marks for all UG

Components	Marks
Test I	5
Test II	5
Model Exam	10
Assignment	5
Attendance*	5
<b>TOTAL</b>	<b>30</b>

#### \*Split-up of Attendance Marks

- ✱ 75-79 - 1 marks
- ✱ 80-84 - 2 marks
- ✱ 85-89 - 3 marks
- ✱ 90-94 - 4 marks
- ✱ 95-100 - 5 marks

### 2. a) Components for Practical I.E.

Components	Marks
Test -I	20
Test - II	20
<b>Total</b>	<b>40</b>

### b) Components for Practical E.E.

Components	Marks
Experiments	50
Record	5
Viva	5
<b>Total</b>	<b>60</b>

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

Institutional /Industrial Training (I.E)		Mini Project (I.E)	Major Project Work		
Component	Marks	Marks	Component	Marks	Total Marks
Work diary	25	-	I.E		
Report	50	50	a)Attendance	10	
Viva-voce	25	50	b)Review/Work diary*	30	40
<b>Total</b>	<b>100</b>	<b>100</b>	E.E** a) Final report	40	
			b)Viva-voce	20	60
			<b>Total</b>		<b>100</b>

\*Review is for Individual Project and Work Diary is for Group Projects  
(group consisting of minimum 3 and maximum 5)

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

### 4. Components for Value Education (Part IV):

S.No.	Components	Marks
a)	Attendance	30 marks
	96% and above - 30 marks	
	91% to 95% - 25 marks	
	86% to 90% - 20 marks	
	76% to 85% - 10 marks	
b)	Participation in group activity	30 marks
c)	Assignment (2 x 10)	20 marks
d)	Test (1 hr for 20 marks)	20 marks
	2 out of 3 questions, 10 marks each	
	<b>Total</b>	<b>100 marks</b>

5. Guidelines for Environmental Studies (Part IV)

Components	Marks
Two Tests (each 2 hours) of 30 marks each [3 out of 5 descriptive questions 3 x 10 = 30 Marks]	60
Field visit and report (10 + 10) (At least one field trip should be arranged)	20
Two assignments (2 x 10)	20
<b>Total</b>	<b>100</b>

6. Guidelines for Skill based subject - Internet Security (Part IV)

Components	Marks
Two Tests (each 2 hours) of 40 marks each [4 out of 7 descriptive type questions 4 x 10 = 40 Marks]	80
Two assignments (2 x 10)	20
<b>Total</b>	<b>100</b>

7. Guidelines for General Awareness (Part IV)

Components	Marks
Two Tests (each 2 hours) of 50 marks each [50 objective type questions 50 x 1 = 50 Marks]	100

8. Guidelines for Law of Ethics (Part V)

Components	Marks
Two Tests (each 2 hours) of 50 marks each [5 out of 8 descriptive type questions 5 x 10 = 50 Marks]	100

9. Guidelines for Extension Activity (Part V)

No of Activities	Marks
2 x 50 ( Each Activity for two days) (Activities may be Educating Rural Children, Unemployed Graduates, Self Help Group etc)	100

10. Value Added Courses and Aptitude/Placement courses:

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

**Guidelines:**

1. The passing minimum for these items should be 40%
2. If the candidate fails to secure 40% passing minimum, he / she may have to reappear for the same in the subsequent Semesters
3. Item No's:4,5,6,7,8,9, 10 are to be treated as 100% Internal papers.
4. For item No.10, Tests conducted through online modules (Google Form/any other)



UG PATTERN

QUESTION PAPER PATTERN FOR CIA I and CIA II EXAM

Reg.No:----- Q.P.CODE:

HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

----- DEGREE CIA-I/CIA-II EXAMINATIONS -----20---

(----- SEMESTER)

BRANCH: -----

SUBJECT NAME: -----

Time: Two Hours

Maximum:50 Marks

SECTION - A (6 x 1 = 6 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(Q.No: 1 to 6: Multiple choice/Fill up the blanks /True or False questions)

SECTION - B (4x 5 = 20 marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(Q.No: 7 to 10 Either Or type)

SECTION - C (3x 8 = 24 marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(Q.No: 11 to 13 : Either Or type)

QUESTION PAPER PATTERN FOR MODEL/END SEMESTER EXAMINATION

Reg.No:-----

Q.P.CODE:

HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

----- DEGREE MODEL EXAMINATIONS -----20-----

(-----SEMESTER)

BRANCH : -----

SUBJECT NAME:-----

Duration: Three Hours

Maximum: 70 Marks

SECTION - A (10x1=10 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(Q.No 1 to 10 Multiple choice/Fill up the blanks /True or False questions)

(Two questions from each unit)

SECTION - B (5x4=20 Marks)

Answer ALL Question

ALL Questions Carry EQUAL Marks

(Q.No 11 to 15 Either or type)

(One question from each Unit)

SECTION- C (5x8=40 Marks)

Answer ALL Questions

ALL Questions carry EQUAL Marks

(Q.No 16 to 20 Either Or type) (One question from each Unit)

**Track-2 Industry Integrated (IBM Data Science)**

**1. Internal Marks : 40 Marks.**

Components	Marks
Two Test*	10
Practical #	10
Assignment \$	10
Project &	10
<b>TOTAL</b>	<b>40</b>

\*-Two internals will be conducted for 30marks. Both the exam marks will be converted to 10 mark

Internal: 30marks

2marks:  $5 \times 2 = 10$ (Description type)

5marks:  $4 \times 5 = 20$ (Description type)

Total: 30marks

\$-Two assignments will be given in the semester which will be like a use case

&-One project to be done based on the subject. Marks will be divided based on the project execution and presentation.

#-Practical exercise will be done in the lab based on scenario based question. Evaluation will be on the students input in the lab and viva

**2. External exam : 60 Marks**

Two marks:  $5 \times 2 = 10$  (Description type)

Ten marks:  $5 \times 10 = 50$  (Description type)

Total: 60 marks

<b>Course Code:</b>	<b>20CTU01</b>	<b>Fundamentals of Computing and C Programming</b>						<b>Batch:</b>	<b>2020-2021</b>
							<b>Semester:</b>	<b>I</b>	
<b>Hrs/Week:</b>	<b>5</b>	<b>L</b>	<b>5</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>-</b>	<b>Credits:</b>	<b>5</b>

### COURSE OBJECTIVE

- Provide exposure to problem-solving through programming.
- Learn the fundamentals of computing techniques.
- Develop simple applications in 'C' language.
- Understand logics that help to create programs..

### COURSE OUTCOME

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Identify appropriate data types, variables, syntax and statements for solving simple problems.	K1
CO2	Understand program solving techniques using arrays, strings, pointers, functions, structures and union for a given scenario.	K2
CO3	Apply appropriate strategies and representations for handling compound data.	K3
CO4	Analyze programs and develop lifelong learning skills needed for computer language	K4

<b>20CTU01</b>	<b>Fundamentals of Computing and C Programming</b>	<b>I</b>
<b>Unit No.</b>	<b>Topics</b>	<b>Hours</b>
<b>I</b>	<b>Introduction to computers:</b> Characteristics and Limitations of computer-Block Diagram of Computer-Types of Computers-Uses of Computers-Computer Generations. <b>Input and output devices:</b> Keyboard and Mouse-Inputting Data in other ways- <b>Types of Software:</b> System Software-Application Software. <b>Memories:</b> Primary- Secondary and Cache memory. <b>Programming Languages:</b> Evolution of Programming Languages-- Translator programs –Problem Solving Techniques.	<b>9</b>
<b>II</b>	<b>Introduction to C:</b> Introduction –Structure of C Program –Writing the first C Program –File used in C Program –Compiling and Executing C Programs –Using Comments –Keywords –Identifiers – Data Types –Variables –Constants –I/O operations –Operators and Expressions -Programming Examples –Type Conversion and Type Casting.	<b>12</b>



III	<b>Decision Control and Looping Statements:</b> Introduction to Decision Control Statements –Conditional Branching Statements –Looping Statements –Nested Loops –Jumps in loops – Goto Statement. <b>Functions:</b> Introduction –using functions –Function declaration –Function definition –Function call –Return statement –Categories of Functions–Recursive function.	12
IV	<b>Arrays:</b> Introduction –One dimensional- Declaration of Arrays –Two dimensional –Multi dimensional –Dynamic arrays – Character arrays and Strings. <b>Pointers:</b> Understanding pointers–Declaring Pointer Variables – Initialization of pointer variables - Accessing a variable through its pointer - Pointer Expressions –Pointers and Arrays- Array of Pointers-Pointers to Functions.	13
V	<b>Structure and Union:</b> Introduction- Defining a Structures- Declaring structure variables-Accessing Structure members-Initialization-Array of structures- Arrays within structures-Structure within structures-Unions. <b>Files:</b> Introduction to Files – Defining and opening a file- Closing a file-I/O operation on files-Random access to files-Command line arguments.	14

*Note: Distribution of marks for Internal Examination –30 and External Examination –70*

**Teaching methods:** Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

#### TEXT BOOK

1. E.Balagurusamy, "Computing Fundamentals and C Programming", TMH 7<sup>th</sup> reprint 2011

#### REFERENCE BOOKS

1. Balaguruswami, "Programming in ANSI C", TMH 21<sup>st</sup> reprint 1998

2. Y.Kanetkar, "Let us C", BPB Publications

3. Brian W Kvenighan, Dennis M.Ritchie, "The C Programming Language", Prentice Hall Software Series, 2nd Edition

#### WEB RESOURCES

**Web Link:** <https://www.tutorialspoint.com/cprogramming/index.html>



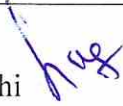


## MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
Mr.M.Karthi 	 Mrs.K.Mythili	

**K. MYTHILI** M.Sc., M.Phil., (Ph.D)  
Associate Professor & HOD  
Department of Computer Science (A)  
Hindusthan College of Arts & Science,  
Coimbatore - 641 028.

Co-ordinator  
Academic Audit Cell  
Hindusthan College of Arts & Science,  
Coimbatore-641 028.

<b>Course Code:</b>	20CTU02	<b>Computer System Architecture</b>						<b>Batch:</b>	2020-2021
<b>Hrs/Week:</b>	4	L	4	T	-	P	-	<b>Semester:</b>	I
								<b>Credits:</b>	4

### COURSE OBJECTIVE

- Learn the basic concepts of Computer Architecture and Organization.
- Impart the knowledge on data representation and logic circuits.
- Learn the concepts of Registers, Interrupts and computer instructions.
- Develop the skills to design the components CPU, IO and Memory.

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Describe various data representation and logic circuits and components of Computers.	K1
CO2	Discuss the basic concepts of computer organization and Architecture	K2
CO3	Explain the internal components of combinational circuits , CPU, I/O and Memory.	K3
CO4	Analyze the design of Logic Circuits ,CPU, IO and Memory	K4
K1- Remember, K2-Understand, K3-Apply, K4-Analyze		

### SYLLABUS

20CTU02	COMPUTER SYSTEM ARCHITECTURE	I
Unit No.	Topics	Hours
I	<b>Data Representation:</b> Number Systems-Binary-Octal-Hexadecimal number-Complements-Floating Point Representation-Other Binary codes –_Error Detection Codes - <b>Logic Circuits:</b> Logic Gates-Combinational Circuits-Half-Adder-Full-Adder- Flip-Flops-SR - JK – D and T flip-flop.	9
II	<b>Basic computer organization:</b> Instruction codes- Computer registers- Computer instructions - Timing and Control - Instruction cycle- Memory - Reference Instructions - Input-output and interrupt - Complete computer description.	10

III	<b>Central processing unit:</b> Introduction - General Register Organization- Stack Organization- Instruction format - Addressing Modes - Data Transfer and Manipulation - Program Control - Reduced Instruction Set Computer (RISC) - Complex Instruction Set Computer (CISC) - comparison of RISC and CISC. <b>Pipelining:</b> Parallel processing - Pipelining - Arithmetic Pipeline - Instruction Pipeline - RISC Pipeline.	10
IV	<b>Input – Output organization:</b> Input-output interface - Asynchronous Data Transfer - Modes of Transfer - Priority Interrupt – DMA - Input-Output Processor (IOP) - CPU-IOP Communication - Serial Communication.	10
V	<b>Memory Organization:</b> Memory Sub System - Memory hierarchy - Main memory - Auxiliary memory - Flash memory - Associative memory - Cache memory - Virtual memory.  <b>Self Study :</b> Intel 8086 Microprocessor	9

*Note: Distribution of marks for Internal Examination- 40 and External Examination –60*

**Teaching methods:** Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

#### TEXT BOOK

1. M. Morris Mano, "Computer System and Architecture", Pearson Education, Third Edition, (30 June 2017).

#### REFERENCE BOOKS

1. Badri Ram , "Advanced Microprocessors and Interfacing", TMH, 2012.
2. W. Stallings, "Computer Organization & Architecture", Pearson Education, 8th Edition. 2012.
3. M. Carter , "Computer Architecture", Schaum 's outline series, TMH, Special Indian Edition.

#### WEBRESOURCES

<https://www.javatpoint.com/computer-organization-and-architecture-tutorial>

[https://www.tutorialspoint.com/computer\\_logical\\_organization/index.html](https://www.tutorialspoint.com/computer_logical_organization/index.html)


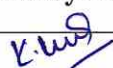

## MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
Mrs.D.Mythili 	 Mrs.K.Mythili	

**K. MYTHILI** M.Sc., M.Phil., (Ph.D)  
Associate Professor & HOD  
Department of Computer Technology  
Hindusthan College of Arts and  
Science (Autonomous)  
Coimbatore - 641 028.

Co-ordinator  
Academic Audit Cell  
Hindusthan College of Arts & Science,  
Coimbatore-641 028.



Course Code:	20CTIU02	Software Foundation Program Using C++						Batch:	2020-2021
							Semester:	I	
Hrs/Week:	4	L	4	T	-	P	-	Credits:	4

### COURSE OBJECTIVE

- Learn the fundamentals of computing techniques and to develop the simple applications in 'C++' language.

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Explain the basic concept of programming languages	K2
CO2	Understand the fundamentals of C++ programming language.	K1
CO3	Apply and experiment the concepts of pointers, arrays, structures and Files in C++	K3
CO4	Analyze and develop application using C++	K4

### SYLLABUS

20CTIU02	Software Foundation Program Using C++	I
Unit No.	Topics	Hours
I	<b>Introduction to C++:</b> OOPS, Essentials of programming, Features of C++, Inheritance, polymorphism and Encapsulation, operator overloading, I/O in C++, Advanced topics	9
II	<b>Information Management:</b> Information as a service, IBM Information management software, order fulfillment system – Example case, Open source derby, cloudscape, DB2 9 pure XML technology, DB2 Express C, DB2 data server editions, Information Integration Business drivers	10
III	<b>Introduction to XML and related technologies:</b> Issues in information Exchange, XML, XML Namespaces, XML Schema, XPATH, XSL Transformation, Introduction to IDE, Eclipse, Eclipse architecture, Eclipse plugin architecture, Eclipse platform architecture, Eclipse case studies	10

IV	<b>Java Development Tools:</b> JDT environment, creating and running a program, automating testing using junit, Use ant and Javadoc.	10
V	<b>Debugging Application:</b> Using the debugger, Start the debugger, setting breakpoints, setting through the code, inspecting variables and expression, Software in the real world	9

*Note: Distribution of marks for Internal Examination- 40 and External Examination –60*

**Teaching methods:** Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

**TEXT BOOKS**

1. IBM Course ware

**REFERENCE BOOKS**

1. "Object Oriented Programming with C++" by Balagurusamy
2. "C++ Weekend Crash Course" by Stephen R Davis
3. "The C++ Programming Language" by Bjarne Stroustrup



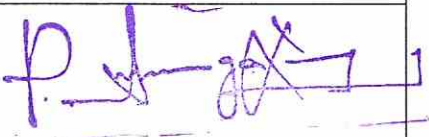
**MAPPING WITH PROGRAM OUTCOMES**

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

S-Strong, M- Medium, L – Low

**ASSESSMENT PATTERN**

Follows Track – 2 Industry Oriented (IBM Data Science) pattern of Internal and External Assessment, as mentioned in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC coordinator
IBM 	 Mrs. K. Mythili	

**K. MYTHILI M.Sc., M.Phil., (Ph.D)**  
Associate Professor & HOD  
Department of Computer Technology  
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<b>Course Code:</b>	<b>20CTU04</b>	<b>Practical - I : Programming using C</b>						<b>Batch:</b>	<b>2020-2021</b>
							<b>Semester:</b>	<b>I</b>	
<b>Hrs/Week:</b>	<b>4</b>	<b>L</b>	<b>-</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>4</b>	<b>Credits:</b>	<b>2</b>

### COURSE OBJECTIVES

- To learn the fundamentals of C Programming
- To gain knowledge about arrays, structures, pointers and functions
- To develop the ability to apply file I/O operations.

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Choose the right data representation formats based on the requirements of the problem.	K1
CO2	Compare the various programming constructs and choose the right one for the task in hand.	K4
CO3	Construct programs that demonstrate effective use of C features including arrays, structures and pointer.	K3
CO4	Illustrate file access.	K2

### SYLLABUS

<b>20CTU04</b>	<b>PRACTICAL I : PROGRAMMING USING C</b>	<b>I</b>
<b>Ex. No.</b>	<b>Program List</b>	
1	Program to develop a Simple Calculator using switch case.	
2	Program to print the Alphabet A to E and reverse the same decreasing one by one line by line using for Loop.	
3	Program to sort numbers in Ascending and descending order using Arrays..	



4	Program to accept two number from user and swap the values using call by reference method
5	Program to find the Prime numbers between two integers using functions
6	Program to implement Matrix operations Addition, Subtraction and Multiplication – using functions.
7	Program to generating Fibonacci Numbers using recursive functions
8	Program for String manipulations without using string functions (string length, string comparison, string copy) (Using function pointers).
9	Define a structure Employee having elements emp_id, name, DOB, DOJ etc. Accept data and reprint it. (use structure within structure)
10	Program to implement dynamic memory allocation.
11	Program to write the content into a file, read the content from the same file and display it.
12	Program to read name and marks of n number of students from user and store them in a file. Again read the information from the file and display on the screen in a Mark Statement format.

*Note: Distribution of marks for Internal Examination- 40 and for External Examination – 60*

**Teaching methods:** PowerPoint Projection through LCD and Execution Methods.

1. To accept two numbers from user and swap the values using call by reference method.  
 2. To find the Prime numbers between two integers using functions.  
 3. To implement Matrix operations Addition, Subtraction and Multiplication – using functions.  
 4. To generate Fibonacci Numbers using recursive functions.  
 5. Program for String manipulations without using string functions (string length, string comparison, string copy) (Using function pointers).  
 6. Define a structure Employee having elements emp\_id, name, DOB, DOJ etc. Accept data and reprint it. (use structure within structure)  
 7. Program to implement dynamic memory allocation.  
 8. Program to write the content into a file, read the content from the same file and display it.  
 9. Program to read name and marks of n number of students from user and store them in a file. Again read the information from the file and display on the screen in a Mark Statement format.


**MAPPING WITH PROGRAM OUTCOMES**

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	M	S	S
CO2	M	S	M	M
CO3	S	M	S	M
CO4	S	S	M	S

S-Strong, M- Medium, L – Low

**ASSESSMENT PATTERN**

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
Mr.M.Karthi 	 Mrs.K.Mythili	

**K. MYTHILI M.Sc., M.Phil., (Ph.D)**  
Associate Professor & HOD  
Department of Computer Technology  
Hindusthan College of Arts and  
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Coimbatore - 641 028.

Co-ordinator  
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Coimbatore-641 028.

Course Code:	20CTU05	Data Structures and Algorithms						Batch:	2020-2021
Hrs/Week:	4	L	4	T	-	P	-	Semester:	II
								Credits:	3

### COURSE OBJECTIVE

- Impart the basic concepts of data structures and algorithms.
- Understand algorithms and its analysis procedure.
- Inculcate knowledge on importance of data structures in context of writing efficient programs.
- Explore the concepts of File Organizations, Symbol tables, Searching and sorting techniques.

### COURSE OUTCOMES (CO)

S.No	COURSEOUTCOME	BLOOMS LEVEL
CO1	Define basic types for data structure, implementation and application	K1
CO2	Illustrate the procedures for implementing data structures and algorithms.	K2
CO3	Develop programming skills to apply appropriate data structures in problem solving.	K3
CO4	Analyze Linear and Non-Linear data structures, file organization, searching and sorting techniques	K4
<b>K1- Remember, K2-Understand, K3-Apply, K4-Analyze</b>		

## SYLLABUS

20CTU05	Data Structures and Algorithms	II
Unit No.	Topics	Hours
I	<b>Introduction to Algorithms</b> :Asymptotic Notations: Big-Oh, Omega and Theta-Best, Worst and Average case Analysis: Definition and an example –Arrays -Stacks and Queues- Fundamentals- <b>Linked List</b> :-Singly Linked List – doubly linked list and Dynamic-Sparse Matrices- Polynomial addition.	11
II	<b>Trees</b> : Binary tree representations – Binary Tree Traversal – Threaded Binary Trees - Counting binary trees. <b>Graphs</b> : Terminology and representations - Traversals, Connected Components.	09
III	<b>Internal sorting</b> - Searching-Insertion sort-Quick sort-Heap Sort-2 way merge sort-Sorting on several keys. <b>External Sorting</b> : Storage device- Magnetic tape – Disk storage – Sorting with disk- K-way merging -Sorting with tape-Balanced Merge sorts-Polyphase Merge.	11
IV	<b>Symbol tables</b> : Static tree table –Dynamic Tree tables-Hash tables -Hashing Functions-overflow handling-Theoretical evaluation of overflow techniques. <b>Files</b> : Files, Queries and Sequential organizations	9
V	<b>Index Techniques</b> :-Hashed Index-tree indexing-B trees. <b>File organizations</b> : Sequential organizations-Random Organization- Linked Organization- Inverted Files-Storage Management.	8

*Note: Distribution of marks for Internal Examination -30 and External Examination –70*

**Teaching methods:** Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

### TEXT BOOK

1. Ellis Horowitz, Sartaj Sahni and Sanguthevar, "Fundamentals of Computer Algorithms(second edition) ", Galgotia Publications, January 2008.



## REFERENCE BOOKS

1. Ellis Horowitz, Sartaj Sahni, Susan Anderson Freed, "Fundamentals Of Data Structures In C", Universities Press (India) Limited, 2017
2. Mark Allen Weiss, "Data Structure and Algorithm analysis in C", Pearson Education, Second Edition, Sixteenth Impression 2014.
3. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, Data Structures and Algorithms, Pearson Education, New Delhi, 2006.

## WEB RESOURCES

[https://www.tutorialspoint.com/data\\_structures\\_algorithms/index.html](https://www.tutorialspoint.com/data_structures_algorithms/index.html)



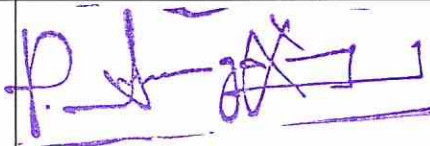
## MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 Ms.G.Priyanka	 Mrs.K.Mythili	

**K. MYTHILI** M.Sc., M.Phil., (Ph.D)  
Associate Professor & HOD  
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Hindusthan College of Arts and  
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Coimbatore-641 028.

<b>Course Code:</b>	<b>20CTIU05</b>	<b>Data Visualization</b>						<b>Batch:</b>	<b>2020-2021</b>
<b>Hrs/Week:</b>	<b>4</b>	<b>L</b>	<b>4</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>-</b>	<b>Semester:</b>	<b>II</b>
								<b>Credits:</b>	<b>3</b>

### COURSE OBJECTIVE

- To manipulate and visualize data using R, python and Watson Studio.

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Simplify the key techniques and theory used in visualization .	K4
CO2	Identify the fundamentals of R and Python programming languages.	K3
CO3	Classify the Data analysis ,Visualization using R and Python and Watson studio	K2
CO4	Formulate the large datasets into visual graphics	K6

### SYLLABUS

<b>20CTIU05</b>	<b>Data Visualization</b>	<b>II</b>
<b>Unit No.</b>	<b>Topics</b>	<b>Hours</b>
<b>I</b>	<b>Introduction to statistics-Descriptive Statistics: Mean, Median, Mode- Inferential Statistics :Random Variables, Probability Distributions, Normal Distribution, Sampling and Sampling Distribution</b>	<b>6</b>

II	<b>Overview of R</b> - Descriptive data analysis using R – Data manipulation with R – Data visualization with R - R studio installation - Data manipulation with R (dplyr,data.table,reshape2package,tidyr package, Lubridate package) - Data Visualization with R (working with BaseR Graphics,ggplot2)	12
III	<b>Data Visualization in Watson Studio</b> – Adding data to data refiner - Visualization of data in Watson Studio.	6
IV	<b>Introduction python</b> -Python scripting basics-Introduction to Jupyter notebook-Numpy and Pandas –Python and Anaconda installation - Pandas (text data, date time columns, indexing and selecting data, groupby ,Merge/join datasets)	12
V	<b>Visualization using python</b> -Data Visualization tools in python – Basic plots using Matplotlib - Specialized Visualization tools using Matplotlib - Advanced Visualization tools using Matplotlib- <b>Advanced visualization tool</b> -Seaborn functionalities – Spatial visualization and analysis in python in folium – Usage of Seaborn functionalities – Case studies.	12

*Note: Distribution of marks for Internal Examination -40 and External Examination -60*

**Teaching methods:** Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

### TEXT BOOKS

1. IBM Course ware

### REFERENCE BOOKS

1. Wes McKinney, "Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython", Oreilly, 2011
2. Andreas C. Muller, Sarah Guido, "Introduction to Machine Learning with Python: A Guide for Data Scientists", Oreilly, 2016


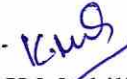
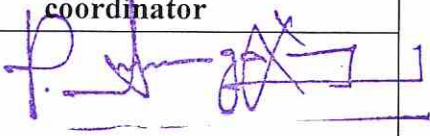
### MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

Follows Track – 2 Industry Oriented (IBM Data Science) pattern of Internal and External Assessment, as mentioned in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC coordinator
IBM 	 Mrs.K.Mythili	

**K. MYTHILI** M.Sc., M.Phil., (Ph.D)  
Associate Professor & HOD  
Department of Computer Technology  
Hindusthan College of Arts and  
Science (Autonomous)  
Coimbatore - 641 028.

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Academic Audit Cell  
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Coimbatore-641 028.



<b>Course Code:</b>	<b>20CTU06</b>	<b>Python Programming</b>						<b>Batch:</b>	<b>2020-2021</b>
							<b>Semester:</b>	<b>II</b>	
<b>Hrs/Week:</b>	<b>3</b>	<b>L</b>	<b>3</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>-</b>	<b>Credits:</b>	<b>3</b>

### COURSE OBJECTIVE:

- To identify the algorithmic problem solving Techniques.
- To describe the Fundamental elements of Python programming basics and paradigm.
- Understanding the concepts of condition and iteration flow controls.
- To Experiment about List, Dictionaries, Tuples, String and Files.

### COURSE OUTCOMES (CO):

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Enumerate the building block of algorithm and notations to Solve the problems.	K1
CO2	Interpret the Syntax and semantics of Python Programming Languages.	K2
CO3	Experiment with structuring the data using Lists, Dictionaries, and Tuples and string.	K3
CO4	Examine the overall concepts of python programming.	K4

**SYLLABUS**

20CTU06	Python Programming	Sem: II
Unit No.	Topics	Hours
I	<b>ALGORITHMIC PROBLEM SOLVING</b> Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion).	7
II	<b>DATA, EXPRESSIONS, STATEMENTS</b> Python interpreter and interactive mode; values and types: int, float, Boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments.	7
III	<b>CONTROL FLOW, FUNCTIONS</b> Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, string functions and methods, Lists as arrays.	7
IV	<b>LISTS, TUPLES</b> Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value.	7
V	<b>DICTIONARIES, FILES</b> Dictionaries: operations and methods; advanced list processing - list comprehension; Files and exception: text files, reading and writing files, format operator; command line arguments.	8

*Note: Distribution of marks for Internal Examination -30 and External Examination -70*  
**Teaching methods:** Slides Projection through LCD, Assignments and Class Tests

**TEXT BOOKS**

1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd edition,
2. Updated for Python 3, Shroff/O'Reilly Publishers, 2016 <http://greenteapress.com/wp/think-python>

**REFERENCE BOOKS**

1. Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python – Revised and updated for Python Network Theory Ltd., 2011.

**WEB RESOURCES**

**Web Link:** <https://greenteapress.com/thinkpython2/thinkpython2.pdf>

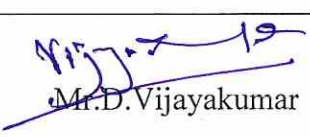
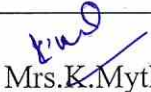

**MAPPING WITH PROGRAM OUTCOMES**

CO \ PO	PO1	PO2	PO3	PO4
CO1	M	L	M	L
CO2	M	M	L	M
CO3	S	M	S	S
CO4	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
 Mr. D. Vijayakumar	 Mrs. K. Mythili	

**K. MYTHILI** Sc., M.Phil., (Ph.D)  
 Associate Professor & HOD  
 Department of Computer Technology  
 Hindusthan  
 Science  
 Coimbatore - 641 028.

**Co-ordinator**  
 Academic Audit Cell  
 Hindusthan College of Arts & Science,  
 Coimbatore-641 028.

<b>Course Code:</b>	20CTU08	<b>Practical - II :Programming using Python</b>					<b>Batch:</b>	2020-2021	
							<b>Semester:</b>	II	
<b>Hrs/Week:</b>	4	L	-	T	-	P	4	<b>Credits:</b>	2

### COURSE OBJECTIVE:

- Develop adequate skills in python programming.
- Understand the implementation of various applications using Python.

### COURSE OUTCOME:

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Write, test and debug Python Programs.	K1
CO2	Implement conditionals and loops for Python Programs.	K2
CO3	Use functions and represent compound data using lists ,Tuples and Dictionaries.	K3
CO4	Develop applications using Tkinter and Bio Python.	K4

20CTU08	Practical II: Programming Using Python	II
Ex. No.	Program List	Hours
1	Program to find first n prime numbers.	6
2	Program to find the exponentiation of a number.	4
3	Program to identify the maximum from a list of numbers.	4
4	Program to perform Binary Search.	5
5	Program to implement Linear Search.	5
6	Program to perform selection sort.	5
7	Create an application to get the currently selected radio button value using UI with TKinter in python.	6
8	Create an application window has two text input fields and another one to display the result using TKinter in Python.	5
9	Gene Sequence mining using Python.	4
10	Bio computing in Python.	4



Note: Distribution of marks for Internal Examination- 40 and for External Examination – 60

Teaching methods: PowerPoint Projection through LCD and Execution Methods.

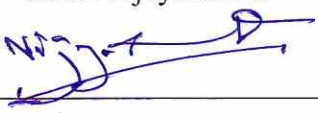

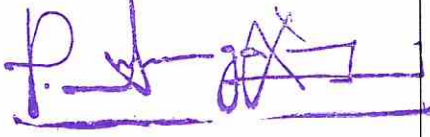
### MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

### ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
Mr.D.Vijayakumar 	 Mrs.K.Mythili	

K. MYTHILI M.Sc., M.Phil., (Ph.D)  
Associate Professor & HOD  
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<b>Course Code:</b>	<b>20CTU09</b>	<b>Database Management System</b>						<b>Batch:</b>	<b>2020-2021</b>
								<b>Semester:</b>	<b>III</b>
<b>Hrs/Week:</b>	<b>5</b>	<b>L</b>	<b>5</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>-</b>	<b>Credits:</b>	<b>5</b>

### COURSE OBJECTIVES

- Study the basic concepts and the applications of database systems. .
- Identify the basics of SQL and construct queries using SQL.
- Learn data modeling and relational database design principles.
- Explore the principles of transaction management.

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS. LEVEL
CO1	Define the basic concepts of database systems.	K1
CO2	Discuss the terminologies in data modeling and database design.	K2
CO3	Apply the database design rules for the design and implementation of databases.	K3
CO4	Devise applications for data modeling, data base queries to implement DBMS concepts.	K4

**SYLLABUS**

20CTU09	Database Management System	III
Unit No.	Topics	Hours
I	<p><b>Introduction to Databases and Transactions:</b></p> <p>What is database system, purpose of database system, view of data, relational databases, database architecture, and transaction management. Data Models: The importance of data models, Basic building blocks, Business rules, The evolution of data models, Degrees of data abstraction.</p>	12
II	<p><b>Database Design ,ER-Diagram and Unified Modeling Language:</b></p> <p>Database design and ER Model: overview, ER-Model, Constraints, ER-Diagrams, ERD Issues, weak entity sets, Codd’s rules, Relational Schemas. Introduction to UML Relational database model: Logical view of data, keys, integrity rules.</p> <p>Relational Database design: features of good relational database design, atomic domain and Normalization (1NF, 2NF, 3NF, BCNF).</p>	12
III	<p><b>Relational Algebra and Calculus:</b></p> <p>Relational algebra: Introduction, Selection and projection, set operations, renaming, Joins, Division, syntax, semantics. Operators, grouping and ungrouping, relational comparison.</p> <p>Calculus: Tuple relational calculus, Domain relational Calculus, calculus vs algebra,computational capabilities.</p>	12
IV	<p><b>Constraints, Views and SQL:</b></p> <p>What is a constraint, Types of constrains, Integrity constraints.</p> <p>Views: Introduction to views, data independence, security, updates on views, comparison between tables and views.</p> <p>SQL: data definition, aggregate function, Null Values, nested sub queries, Joined relations. Triggers.</p>	12
V	<p><b>Transaction management and Concurrency control:</b></p> <p>Transaction management: ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods, optimistic methods, database recovery management.</p>	12

**Note: Distribution of marks for Internal Examination -30 and External Examination –70**

**Teaching methods:** Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

### TEXT BOOK

1. *A Silberschatz, H Korth, S Sudarshan, "Database System and Concepts" fifth Edition McGraw-Hill, Rob, Coronel, "Database Systems", Seventh Edition, Cengage Learning.*

### REFERENCE BOOKS

1. *Raghurama Krishnan, Johannes Gehrke Data base Management Systems, , McGrawHill Education, 3rd Edition, 2003.*
2. *C. J. Date, A. Kannan and S. Swamynathan, An Introduction to Database Systems, Pearson Education, Eighth Edition, 2009.*
3. *Abraham Silberschatz, Henry F. Korth and S. Sudarshan, Database System Concepts, McGraw-Hill Education (Asia), Fifth Edition, 2006.*

### WEB RESOURCES

- <https://www.tutorialspoint.com/dbms/index.htm>
- <https://www.javatpoint.com/dbms-tutorial>
- <https://tutorialspoint.dev/computer-science/dbms>




## MAPPING WITH PROGRAM OUTCOMES

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	M	M
CO2	S	S	M	M
CO3	M	S	S	S
CO4	S	M	S	S

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 Mrs.R.Sivaranjani	 Mrs.K.Mythili	

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<b>Course Code:</b>	<b>20CTU10</b>	<b>Computer Networks</b>						<b>Batch:</b>	<b>2020-2021</b>
								<b>Semester:</b>	<b>III</b>
<b>Hrs/Week:</b>	<b>5</b>	<b>L</b>	<b>5</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>-</b>	<b>Credits:</b>	<b>5</b>

### **COURSE OBJECTIVES**

- Learn the basic terminology of computer networks and functions of TCP/IP and OSI Reference Model Layer
- Obtain the theoretical understanding of data communication and Layers.
- Introduce the various protocols of Data Link Layer, Medium Access Control Sublayer, Transport Layer, Network Layer and Application Layer.
- Study various Routing Algorithms, Wireless Communication Technology and Security Mechanisms in the design of Computer Networks.

### **COURSE OUTCOMES (CO)**

<b>S.No</b>	<b>COURSE OUTCOME</b>	<b>BLOOMS LEVEL</b>
CO1	Define the basic terminology of Computer Networks and Functions of TCP/IP and OSI Reference Model Layers.	K1
CO2	Illustrate the concepts of Data communication and Layers.	K2
CO3	Apply the various protocols of TCP/IP OSI Layers in design of Computer Networks.	K3
CO4	Analyze the techniques of Routing, Wireless Communications and Security Mechanisms	K4

**SYLLABUS**

20CTU10	COMPUTER NETWORKS	III
Unit No.	Topics	Hours
I	<b>Introduction:</b> - Uses Of Computer Networks- Network Hardware- Network Software- Reference Models- The OSI Reference Model- The TCP/IP - Reference Model- A Comparison Of The OSI And TCP/IP Reference Models- Example Networks- The Internet Third-Generation Mobile Phone Networks- Wireless LANs:- RFID And Sensor Networks- <b>The Physical Layer</b> :The Theoretical Basis For Data Communication- Fourier Analysis- Bandwidth-Limited Signals- The Maximum Data Rate Of A Channel-Guided Transmission Media - Wireless Transmission- Communication Satellite - The Mobile Telephone System.	10
II	<b>The Data Link Layer:-</b> Data Link Layer Design Issues- Error Detection And Correction- Elementary Data Link Protocols- Sliding Window Protocols- <b>The Medium Access Control Sublayer-</b> Multiple Access Protocols- Aloha- Carrier Sense Multiple Access Protocols- Collision - Free Protocols- Limited-Contention Protocols- Wireless LAN Protocols- Ethernet- Wireless LANs- Broadband Wireless- <b>Bluetooth-</b> RFID- Data Link Layer Switching	10
III	<b>The Network Layer:-</b> Network Layer Design Issues- Routing Algorithms- The Optimality Principle -Shortest Path Algorithm- Flooding-Distance Vector Routing-Link State Routing-Hierarchical Routing-Broadcast Routing-Multicast Routing - Any cast Routing - Routing For Mobile Hosts- Routing In Ad Hoc Networks- Congestion Control Algorithms- Internetworking- The Network Layer In The Internet- IP Addresses – IP Version 6 -Internet Control Protocols- OSPF- BGP- Internet Multicasting- Mobile IP.	15
IV	<b>The Transport Layer:-</b> The Transport Service-Services Provided To The Upper Layers-Transport Service Primitives-Berkeley Sockets- Elements Of Transport Protocols- The Internet Transport Protocols: UDP-The Internet Transport Protocols: TCP- Performance Issues- Delay- Tolerant Networking.	15
V	<b>The Application Layer:</b> - DNS - The Domain Name System-Electronic Mail- <b>Network Security-</b> Cryptography- Symmetric-Key Algorithms- Public-Key Algorithms- Digital Signatures- Communication Security- Authentication Protocols- Email Security- Web Security.	10

**Note: Distribution of marks for Internal Examination -30 and External Examination –70**

**Teaching methods:** Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

### TEXT BOOK

1. Andrew S. Tanenbaum and David J. Wetherall - "Computer Networks"- Prentice hall India Pub- Fifth Edition-2011.

### REFERENCE BOOKS

- 1 Achyut. S. Godbole, " Data Communications and Networks"- Tata McGraw-Hill Publishing Company- Fifth Edition-2007.
- 2 William Stallings-" Data and computer communications"- PHI- seventh edition-2000.
- 3 Uyles Black – "Computer Networks Protocols, Standards, And Interfaces" – PHI – Second edition-2015.

### WEB RESOURCES

[https://www.youtube.com/watch?v=QKfk7YFILws&ab\\_channel=Geek%27sLesson](https://www.youtube.com/watch?v=QKfk7YFILws&ab_channel=Geek%27sLesson)

<https://www.ece.uvic.ca/~itraore/elec567-13/notes/dist-03-4.pdf>

<https://nptel.ac.in/courses/106/105/106105183>






## MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 Mrs.D.Mythili	 Mrs.K.Mythili	

**K. MYTHILI M.Sc., M.Phil., (Ph.D)**  
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**Co-ordinator**  
**Curriculum Development Cell**  
**Hindusthan College of Arts & Science,**  
**Coimbatore-641 028.**

<b>Course Code:</b>	20CTU11	PC Hardware and Troubleshooting					<b>Batch:</b>	2020-2021	
							<b>Semester:</b>	III	
<b>Hrs/Week:</b>	4	L	4	T	-	P	-	<b>Credits:</b>	4

### COURSE OBJECTIVES

- Learn personal computer hardware including personal computer assembly and upgrading, setup and configuration, and troubleshooting.
- Develop technology skills of students required for troubleshooting motherboard and storage.
- Learn software and hardware troubleshooting techniques used to identify and correct computer problems.
- Inculcate knowledge on external I/O interfaces.

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	List the fundamentals of PC technology and hardware components.	K1
CO2	Associate troubleshooting techniques to motherboard and storage .	K2
CO3	Illustrate principles of external I/O interfaces.	K3
CO4	Analyze various troubleshooting techniques to resolve hardware and software problems.	K4

**SYLLABUS**

20CTU11	PC Hardware and Troubleshooting	III
Unit No.	Topics	Hours
I	Fundamentals of PC Technology: Fundamental building blocks of the PC - Principles of CPU operation - Trouble shooting the CPU: Handling and replacing the CPU- CPU configuration- CPU troubleshooting checklist - Memory: How memory works - Troubleshooting memory - Advanced memory technologies: DRAM – DDRAM –PPRAM	9
II	Motherboards: Motherboard controllers and system resources - The I/O system bus - On board I/O devices – Chipsets - ROM BIOS - ROM POST - The power supply - Ventilation and cooling protection.	9
III	Magnetic storage Principles: Magnetic storage – How Magnetic field are used to Store – Head Sliders – Hard Disk Storage: Hard Disk Advancement and its Features – Removable Disk Storage: The Role of removable media drives – Optical Storage: Optical Technology – CD Construction and Technology - DVD Construction and Technology	10
IV	External I/O Interfaces: Introduction to I/O Ports - Serial Vs Parallel – Universal Serial Bus (USB) – Input Devices: Keyboards/Mouse Interface - Keyboard troubleshooting and Repair – Mouse troubleshooting – Wireless Input Devices – Power management features of wireless input devices – Troubleshooting wireless input devices	10
V	Troubleshooting tools and techniques: Tools of the trade - Basic PC handling techniques. Basic data recovery and disaster recovery: Disk structure and Data recovery: partitions- the master boot record- partition tables- extended partitions- file allocation tables - Disaster recovery	10

**Note: Distribution of marks for Internal Examination -30 and External Examination –70**

**Teaching methods:** Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

Teaching methods: Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

### TEXT BOOKS

1. Scott Mueller's, *Upgrading & Repairing PCs*:– Pearson Education, Inc, 19<sup>th</sup> Edition – 2010.

### REFERENCE BOOKS

1. Craig Zacker and John Rourke, *The Complete Reference PC Hardware*, Tata McGraw-Hill – 2001.

2. The Winn L. Rosch *Hardware Bible*, A Prentice Hall Computer, 6<sup>th</sup> Edition-2003.

3. Kate J. Chase, *PC Hardware and A+ Handbook*, Microsoft Corporation – 2004.

### WEB RESOURCES

<https://abiiid.files.wordpress.com/2010/12/pc-hardware-a-beginners-guide.pdf>

<http://www.computerhope.com/>

<http://www.brighthub.com/>

### MAPPING WITH PROGRAM OUTCOMES

PO \ CO	PO1	PO2	PO3	PO4
CO1	S	M	S	S
CO2	S	S	S	M
CO3	S	S	M	M
CO4	S	M	S	M

S - Strong, M- Medium, L – Low



## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
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Course Code:	20CTIU11	Design Thinking						Batch:	2020-2021
								Semester:	III
Hrs/Week:	4	L	4	T	-	P	-	Credits:	4

### COURSE OBJECTIVES

- Understand what came before design thinking and how it built upon previous approaches.
- See how design thinking is introduced in an organization and understand the transformation.
- Get an overview of the whole approach to design thinking
- Explore the technology specializations

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Define a strong understanding of the Design Process and how it can be	K1
CO2	Demonstrate to build empathy for target audiences from different “cultures”	K2
CO3	Experiment with research and understand the unique needs of a company around	K3
CO4	Test for innovative ideas through a rapid iteration cycle	K4

### SYLLABUS

20CTIU11	DESIGN THINKING	III
Unit No.	Topics	Hours
I	<b>DESIGN THINKING HISTORY AND OVERVIEW:</b> Understand what came before Design thinking-Identify who did what to bring it about-Learn how it built upon previous approaches-How design thinking is introduced in an organization-Understand the transformation required-What outcomes are possible-Understand the whole approach to design thinking-Determinewhat is most important	10
II	<b>KEY HABITS:</b> Introduction to key habits-types-avoid common anti-patterns-Optimise for success with these habits-Introduction to loop-Importance of iteration-How to observe, Reflect &Make-Drill down and do tomorrow	10

<b>III</b>	<b>USER RESEARCH AND MAKE</b> Importance of user research-Appreciate empathy through listening-Key methods of user research-How make fits into the loop-Leverage observe information-Ideation, storyboarding & Prototyping.	<b>9</b>
<b>IV</b>	<b>USER FEEDBACK AND TEACHING</b> User feedback and the loop-Different types of user feedback-How to carryout getting feedback-Understand the challenges of teaching EDT-Valuable hints and tips-Ready to teach the course	<b>10</b>
<b>V</b>	<b>LOGISTICS AND APPLICATIONS:</b> Understand what type of room you need-Learn what materials and supplies you need-Learn how to setup the room-Domains that are applicable-Digital versus physical-Explore some technology specialization	<b>9</b>

**Note: Distribution of marks for Internal Examination -40 and External Examination –60**

**Teaching methods:** Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

### TEXT BOOK

1. *IBM Course ware*

### REFERENCE BOOKS

1. *Tom Kelley Creative Confidence-.,2013*
2. *Tim Brown: Change by Design-.,2009*
3. *Nigel Cross: Design Thinking-., Kindle Edition*

## WEB RESOURCES

[https://www.tutorialspoint.com/design\\_thinking/design\\_thinking\\_introduction.html](https://www.tutorialspoint.com/design_thinking/design_thinking_introduction.html)

<https://www.slideshare.net/marknb00/hitd-201-design-thinking-lecture-1-introduction>

<https://lecturenotes.in/m/22928-design-thinking>




## MAPPING WITH PROGRAM OUTCOMES

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	L	-
CO2	S	S	M	L
CO3	S	S	S	S
CO4	S	S	S	S

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
IBM 	 Mrs.K.Mythili	

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Course Code:	20CTU13	Practical -III: DBMS Applications						Batch:	2020-2021
								Semester:	III
Hrs/Week:	6	L	-	T	-	P	6	Credits:	3

### COURSE OBJECTIVES

- Understand and gain knowledge in database concepts.
- Design and develop applications using front end tools and back end DBMS.
- Understand the practical applicability of database management system concepts
- Working on existing database systems, designing of database, creating relational database, analysis of table design

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Find the underlying concepts of database	K1
CO2	Experiment with Database model and determining the DDL and DCL commands	K3
CO3	Demonstrating PL/SQL functions	K2
CO4	Analyze the Design and Validate by building applications.	K4

### SYLLABUS

20CTU13	Practical -III: DBMS Applications	III
Ex. No.	Program List	Hours
1	To create, alter and drop tables with integrity constraints	6
2	To demonstrate the retrieval and modification of data from a database using SQL	7
3	To demonstrate the application of single row functions in SQL	7
4	To demonstrate the application of group functions in SQL	7
5	To demonstrate the application of querying multiple tables in SQL	7
6	To demonstrate the application of SQL	7
7	To demonstrate the application of views in SQL	7

8	To understand the utility and structure of PL/SQL programmes	8
9	To demonstrate the transaction management using PL/ SQL programmes	8
10	To understand the structure and applications of Cursor in PL/SQL	8

Note: Distribution of marks for Internal Examination- 40 and for External Examination– 60

**Teaching methods:** PowerPoint Projection through LCD and Execution Methods.

### MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

### ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
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<b>Course Code:</b>	<b>20CTU14</b>	<b>Practical – IV :Networking</b>						<b>Batch:</b>	<b>2020-2021</b>
								<b>Semester:</b>	<b>III</b>
<b>Hrs/Week:</b>	<b>3</b>	<b>L</b>	<b>-</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>3</b>	<b>Credits:</b>	<b>2</b>

### COURSE OBJECTIVES

- Impart knowledge about Computer Networks, various protocols used in Communication.
- Manage and configure Cisco Switches and Routers to implement WAN technologies
- Illustrate Client - Server architectures and prototypes by the means of correct standards and technology.
- Demonstrate different routing and switching algorithms

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Build enterprise network for given user requirements in an application.	K3
CO2	Define a network in recent methodology and also to make remote connectivity as one's own work, as a member and leader in a team.	K1
CO3	Classify packet/file transmission between nodes.	K4
CO4	Demonstrate protocol and network operation in a simulated environment.	K2

**SYLLABUS**

20CTU14	Practical – IV :Networking	III
Ex. No.	Program List	Hours
1	Program to determine class, Network and Host ID	4
2	Program to Configure DHCP and DNS Server	4
3	Program to implement the File Transfer Protocol	4
4	Program to downloading the file from HTTP Server	4
5	Program to Configure SNMP	5
6	Program to implement the RIP Routing Protocol	5
7	Program to implement the Multicasting service.	5
8	Study on Network interfacing and communication of physical objects, devices and peripherals	5

**Note: Distribution of marks for Internal Examination- 40 and for External Examination – 60**

**Teaching methods:** PowerPoint Projection through LCD and Execution Methods.

**MAPPING WITH PROGRAM OUTCOMES**



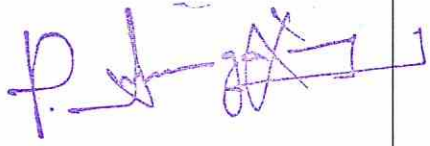
CO \ PO	PO1	PO2	PO3	PO4
CO1	M	S	S	S
CO2	M	S	S	S
CO3	M	M	M	L
CO4	M	S	S	S

**S - Strong; M-Medium; L-Low**



**ASSESSMENT PATTERN**

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
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<b>Course Code:</b>	<b>20CTU15</b>	<b>JAVA Programming</b>						<b>Batch:</b>	<b>2020-2021</b>
							<b>Semester:</b>	<b>IV</b>	
<b>Hrs/Week:</b>	<b>6</b>	<b>L</b>	<b>6</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>-</b>	<b>Credits:</b>	<b>6</b>

### COURSE OBJECTIVES

- To describe the basic knowledge of object-oriented programming, the fundamental Concepts of java and its advanced concepts
- To understand the overview of standalone Java applications and web Applications.
- To illustrate the key aspects of java Standard API library such as IO, Applets and Thread, GUI based controls and File concepts.
- To Experiment the overall concepts Java Programming.

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Observes the knowledge about the principles of Java programming.	K1
CO2	Relate the concepts of Object Oriented Programming to Develop Java applications.	K2
CO3	Develops the robust & concurrent application using Multithreading, Applets, Threads and Exception handling concepts.	K3
CO4	Examines and Experiment Java applications with Graphical User Interface (GUI) and Files.	K4

### SYLLABUS

20CTU15	JAVA Programming	IV
Unit No.	Topics	Hours
I	<b>Introduction to Java</b> Features of Java - History of Java- Structure – Java Tokens – Statements – Java Virtual Machine - Data Types - Variables - Operators - Decision Making and Branching - Decision Making and Looping	14
II	<b>Object Oriented concepts:</b> Classes, Objects and Methods: Methods & variables - Constructor-Overloading - Static members - Final Classes – Abstract method- Arrays, Strings and Vectors. – Interfaces: Multiple Inheritance –Extending interfaces-implementing	15

	interfaces. Packages: Putting Classes together-creating, accessing & using packages.	
III	<p><b>Multithreaded Programming:</b> creating Threads -Extending Threads -Thread life cycle- Thread Exception- Priority-Implementing Runnable interface.</p> <p><b>Managing Errors and Exceptions:</b> Introduction- Exception handling – Exceptions- Multiple Catch statement-using finally statement– Applet Programming – Graphics Programming.</p>	14
IV	<p><b>Files:</b></p> <p>Managing Input / Output Files in Java : Concepts of Streams- Stream Classes – Byte Stream classes – Character stream classes – Using streams – I/O Classes – File Class – I/O exceptions – Creation of files – Reading / Writing characters, Byte-Handling Primitive data Types – Random Access Files. <b>Advanced concepts of Java:</b>AWT Class and Controls: Introduction -AWT class - AWT controls-Labels, Buttons, CheckBox, List, TextField, TextArea– AWT managers and menus – Layout manager - MenuBar&amp; Menus - Event handling by AWT components.</p>	15
V	<p><b>Java Bean :</b></p> <p>Introduction: Java Bean - Socket Programming – Servlets - Java Server Pages, JDBC. Networking : Classes and Interface – Inet Address – Inet4 and Inet6 Address – TCP/IP Client Sockets – URL – TCP/IP Server Sockets- Datagrams.</p>	14

*Note: Distribution of marks for Internal Examination -30 and External Examination –70*

**Teaching methods:** Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

## TEXT BOOKS

1. Balagurusamy.E, "*Programming with Java*", TMH, 6th Edition, 2019.
2. Herbert Schildt, "*The Complete Reference Java*", Paperback, 7th Edition, 2011

## REFERENCE BOOKS

1. John R. Hubbard, "*Programming with Java*", TMH, 2nd Edition. 2004
2. Patrick Naughton & Herbert Schildt, "*The Complete Reference Java 2*", TMH, 3rd Edition. 2005.
3. James Gosling, Bill Joy, Guy Steele, Gilad Bracha, and Alex Buckley, "*The Java Language Specification*", Java SE 8, March 2014.



## WEB RESOURCES

<https://www.tutorialspoint.com/java/index.htm>

<https://www.edureka.co/blog/advanced-java-tutorial>

<https://www.javatpoint.com/>

## MAPPING WITH PROGRAM OUTCOMES

CO	PO	PO1	PO2	PO3	PO4
CO1		S	S	M	S
CO2		M	S	S	S
CO3		S	S	S	M
CO4		S	S	S	M

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
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<b>Course Code:</b>	20CTU16	<b>LINUX and Shell Programming</b>						<b>Batch:</b>	2020-2021
								<b>Semester:</b>	IV
<b>Hrs/Week:</b>	6	L	6	T	-	P	-	<b>Credits:</b>	6

### COURSE OBJECTIVES

- Educate the principles of operating system including File handling utilities, Security by file permissions, Process utilities, Disk utilities and Networking Commands.
- Familiarize shell programming, pipes, input and output redirection
- Develop the ability to formulate regular expressions and use them for pattern matching
- Learn the essential facts of SHELL programming in order to solve the SHELL script problems.

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Define the basics of operating system.	K1
CO2	Identify various Linux commands to manipulate system operations.	K2
CO3	Develop shell scripts using the shell programming structures	K3
CO4	Analyze the execution of shell commands.	K4

### SYLLABUS

20CTU16	<b>LINUX and Shell Programming</b>	IV
<b>Unit No.</b>	<b>Topics</b>	<b>Hours</b>
I	<b>INTRODUCTION TO OPERATING SYSTEMS AND LINUX:</b> Basics of Operating Systems: Definition – Generations of Operating systems – Types of Operating Systems, OS Service - A brief history of LINUX.	14
II	<b>LINUX UTILITIES:</b> Architecture of LINUX - features of LINUX - introduction to vi editor. <b>Linux commands-</b> PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip, file handling utilities, security by file permissions,	

	process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin. Text Processing utilities and backup utilities, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, cpio	15
III	<b>Introduction to Shells:</b> Linux Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command- Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization.	15
IV	<b>Filters:</b> Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count Characters, Words or Lines, Comparing Files.	14
V	<b>Grep:</b> Operation, grep Family, Searching for File Content. <b>Sed: Scripts,</b> Operation, Addresses, commands, Applications, grep and sed.	14

*Note: Distribution of marks for Internal Examination -30 and External Examination –70*

**Teaching methods:** Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

#### TEXT BOOKS

1. Richard Petersen, *Linux: The Complete Reference, Sixth Edition*, Tata McGraw-Hill Publishing Company Limited, New Delhi, Edition 2008.
2. Silberschatz, Peter B. Galvin and Greg Gagne, , *Operating System Concepts*, Wiley - Indian Edition, 2012

#### REFERENCE BOOKS

1. Robert Love, O'Reilly ,*Linux System Programming, 2<sup>nd</sup> Edition SPD.2008*
2. W. Richard. Stevens, *Advanced Programming in the UNIX Environment, 3rd edition*, Pearson Education, New Delhi, India.(2005),
3. Daniel P. Bovet ,*Understanding the Linux Kernel: From I/O Ports to Process Management* ,O'Reilly, Kindle Edition, 2012

#### WEB RESOURCES

[www.shellscript.sh/](http://www.shellscript.sh/)

<https://linuxconfig.org/bash-scripting-tutorial-for-beginners>

<https://www.geeksforgeeks.org/introduction-linux-shell-shell-scripting>




**MAPPING WITH PROGRAM OUTCOMES**

CO \ PO	PO1	PO2	PO3	PO4
CO1	M	S	S	S
CO2	S	S	S	M
CO3	M	M	S	M
CO4	S	S	M	S

S-Strong, M- Medium, L – Low

**ASSESSMENT PATTERN**

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 Dr.C.Thirumoorthi	 Mrs.K.Mythili	

**K. MYTHILI M.Sc., M.Phil., (Ph.D)**  
**Associate Professor & HOD**  
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**Curriculum Development Cell**  
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**Coimbatore-641 028.**



<b>Course Code:</b>	20CTIU16	<b>Business Intelligence</b>						<b>Batch:</b>	2020-2021
								<b>Semester:</b>	IV
<b>Hrs/Week:</b>	6	L	6	T	-	P	-	<b>Credits:</b>	6

### COURSE OBJECTIVES

- To understand concept and regular terminology of reporting applications.
- Identify the benefits of Descriptive analytics using Cognos BI
- Analyzing and visualizing the data using Cognos BI
- Organize big data sets into meaningful structures, incorporating data profiling and quality standards

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Illustrate and manage Business performance	K2
CO2	Define how business performance's activities will be achieved by using modeling, provisioning and visualization	K1
CO3	Solve Basic features of cognos BI	K3
CO4	Formulate calculations , Filters ,Prompt and security in Cognos BI	K4

### SYLLABUS

20CTIU16	Business Intelligence	IV
Unit No.	Topics	Hours
I	<b>INTRODUCTION:</b> IBM Cognos 10 Family -BI Enterprise Components, BI Architecture (high level)BI Security, BI Groups and Roles -Framework Manager UI, View the top-level objects and reports-Package as a report author.	15
II	<b>DATA STRUCTURE:</b> Data Sources and Model Types-Differentiate Data Entities- Relational Models-Operational vs. Reporting -Operational Databases- Example of an Operational and Reporting Database Query-Create a Star Schema from an Operational Model- Operational Data -Reporting Data- Fact Table-Dimension Tables-Define Relationships - Identify Issues with a Star Schema-Cardinality- Relationships-.	14

<b>III</b>	<p><b>REPORTS:</b></p> <p>Introduction to the Reporting Application - Report Studio- Explore the Environment Explorer Bar and Report Templates- Generate the Report-Create List Reports - Group Data-Format List Column- Include List Headers and Footers-Focus Reports using Filters- Create Filters- Filter Your Data with Advanced Detail Filters-Create Crosstab Reports-Create a Crosstab Report- Add Measure to Crosstab Reports-Format Crosstab Reports</p>	<b>14</b>
<b>IV</b>	<p><b>GRAPHICAL REPORT</b></p> <p>Data Graphically - Chart Report- Charts Containing Peer and Nested Items-Reuse Custom Chart Palettes-Data driven Baselines and Markers to Charts-Focus Reports using Prompts - Parameters and Prompts-Create a Parameter Item on the Report-Build a Prompt Page- Prompt Item to a Report-Extend the Model to add Staff Location Metadata-Rearrange the diagram.</p>	<b>14</b>
<b>V</b>	<p><b>DATA SOURCE:</b></p> <p>Extend Reports using Calculations - Derive Additional Information from the Data Source-Run-time Date/Time Functions to Report - String Functions - Customize Reports with Conditional Formatting-Change Displays Based on Conditions-Steps for Conditional Formatting-Drill Through from One Report to Another. Navigate to Related Data in IBM Cognos BI-Set Up Drill-Report-Values Passed to Target Parameters-Create a Report using Relational Data-Relational Data Tree-List Object-Introduction to BI Administration BI Administration Workflow, Portal and Configuration--Create a Report from a Dimensionally-modeled Relational Data Source.</p>	<b>15</b>

*Note: Distribution of marks for Internal Examination -40 and External Examination -60*

**Teaching methods:** Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

### TEXT BOOK

1. IBM Course ware

### REFERENCE BOOKS

R2: IBM COGNOS BI V 10.1 – Hand Book (RED BOOK)

## WEB RESOURCES

[https://www.tutorialspoint.com/management\\_information\\_system/business\\_intelligence\\_system.htm](https://www.tutorialspoint.com/management_information_system/business_intelligence_system.htm)

<https://www.geektonight.com/business-intelligence-notes-pdf/>

<https://www.guru99.com/business-intelligence-definition-example.html>




## MAPPING WITH PROGRAM OUTCOMES

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	L	-
CO2	S	S	M	L
CO3	S	S	S	S
CO4	S	S	S	S

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 IBM	 Mrs.K.Mythili	

**K. MYTHILI M.Sc., M.Phil., (Ph.D)**  
**Associate Professor & HOD**  
**Department of Computer Technology**  
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**Co-ordinator**  
**Curriculum Development Cell**  
**Hindusthan College of Arts & Science,**  
**Coimbatore-641 028.**

<b>Course Code:</b>	20CTU17	<b>Practical – V: Programming Using Java</b>						<b>Batch:</b>	2020-2021
								<b>Semester:</b>	IV
<b>Hrs/Week:</b>	6	L	-	T	-	P	6	<b>Credits:</b>	3

### COURSE OBJECTIVES

- Understand and Develop Standalone Java Programs.
- Design and Develop GUI Applications using AWT, Applet and Swing.
- Design event driven GUI and web related applications which mimic the real world scenarios.
- Propose the use of Networking technologies by implementing them in the Java programming language to solve the given problem.

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Relate Java problems using object-oriented concepts	K1
CO2	Demonstrate java applications using packages & collection interfaces.	K2
CO3	Develop concurrent Applications using Multithreading	K3
CO4	Categorize Event driven and Graphical User Interface programming using AWT and Applet	K4



**SYLLABUS**

20CTU17	Practical – V: Programming Using Java	IV
Ex. No.	Program List	Hours
1	Write the java program for the manipulation of string class.	6
2	Write a java program to implement the multiple inheritance using interfaces.	6
3	Write a java program to demonstrate the use of packages.	6
4	Write a java program to implement the concept of Multithreading.	6
5	Write a java program to create an Exception and throw the exception.	6
6	Write a java program to implement the concept of Applet & AWT Events.	6
7	Develop a GUI program using Swing components.	6
8	Write a java program which open an existing file and append the text to that file.	6
9	Develop a program to Analyze the Gene sequence.	6
10	Write a program for calculating Biocomputing.	6
11	Write a Socket Program to Perform file transfer from Server to the Client.	6
12	Write a Program to implement Remote Procedure call under Client / Server Environment	6

*Note: Distribution of marks for Internal Examination- 40 and for External Examination – 60*

**Teaching methods:** PowerPoint Projection through LCD and Execution Methods.


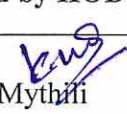

### MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

### ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
Mrs.D.Mythili 	Mrs.K.Mythifi 	

**K. MYTHILI M.Sc., M.Phil., (Ph.D)**  
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<b>Course Code:</b>	<b>20CTU19</b>	<b>Practical – VI :Web Technology</b>						<b>Batch:</b>	<b>2020-2021</b>
								<b>Semester:</b>	<b>IV</b>
<b>Hrs/Week:</b>	<b>5</b>	<b>L</b>	<b>-</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>5</b>	<b>Credits:</b>	<b>3</b>

### COURSE OBJECTIVES

- Evaluate problems and analyze data using current technologies in a wide variety of business and organizational contexts.
- Build dynamic web pages using JavaScript (Client side programming)
- Create XML documents and Schemas.
- Incorporate best practices for building applications by using ASP.

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Develop a webpage and publishing them.	K3
CO2	Demonstrate software systems of varying complexity using Javascript and ASP.	K2
CO3	Categorize well formed/ Valid XML Document.	K4
CO4	Choose web application development software tools like Javascript, ASP, XML and identify the environments currently available on the market to design web sites as a member and leader in a team.	K1

### SYLLABUS

20CTU19	Practical – VI :Web Technology	IV
Ex. No.	Program List	Hours
1	Write a JavaScript to design a simple calculator to perform the following operations: sum, product, difference and quotient.	6
2	Using Java Script's Window and document objects and their properties and various methods like alert (), eval (), ParseInt () etc. methods to give the dynamic functionality to HTML web pages.	6
3	Writing Java Script snippet which make use of Java Script's inbuilt as well as user defined objects like navigator, Date Array, Event, Number etc.	6
4	Write a JavaScript code that displays text "TEXT-GROWING" with increasing font size in the interval of 100ms in RED COLOR, when	6



	the font size reaches 50pt it displays “TEXT-SHRINKING” in BLUE color. Then the font size decreases to 5pt.	
5	Develop and demonstrate a HTML5 file that includes JavaScript script that uses functions for the following problems: a. Parameter: A string b. Output: The position in the string of the left-most vowel c. Parameter: A number d. Output: The number with its digits in the reverse order	6
6	Design an XML document to store information about a student. The information must include Reg No, Name, and Name of the College, Branch, Year of Joining, and email id. Make up sample data for 3 students. Create a CSS style sheet and use it to display the document	6
7	Design a personal web page using ASP.	6
8	Perform different Text file operations using Textstream Object in ASP.	6
9	Write a Program in ASP to get data using a form, validate the data and returns the same data for correction if any using the same form	6
10	Display a different content each time a user visits a page Using ASP 3.0.	6

*Note: Distribution of marks for Internal Examination- 40 and for External Examination – 60*

**Teaching methods:** PowerPoint Projection through LCD and Execution Methods.




### MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

### ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
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<b>Course Code:</b>		<b>Animation Techniques</b>						<b>Batch:</b>	<b>2020-2021</b>
<b>Hrs/Week:</b>	2	<b>L</b>	<b>2</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>-</b>	<b>Semester:</b>	
								<b>Credits:</b>	

### COURSE OBJECTIVE:

- Understand about Animation techniques
- To familiarize the students with various approaches, methods and techniques of Animation Technology.
- To develop competencies and skills needed for becoming an effective Animator

### COURSE OUTCOME:

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	List the basic concepts of Animation Techniques	K1
CO2	Explain 2D and 3D Animation Techniques	K4
CO3	Develop Animation using Flash	K3
CO4	Demonstrate Time line based Animation	K2

	<b>Animation Techniques</b>	<b>2</b>
<b>Unit No.</b>	<b>Topics</b>	<b>Hours</b>
<b>I</b>	What is mean by Animation – Why we need Animation – History of Animation – Uses of Animation – Types of Animation – Principles of Animation – Some Techniques of Animation – Animation on the WEB – 3D Animation – Special Effects - Creating Animation.	<b>8</b>
<b>II</b>	Traditional 2D Animation Concept – Types of 2D Animation – Techniques of 2D Animation – Color – Text – Formation – Size – Script Animation – Time Line Effects – Application of 2D Animation – Characterization 2D – Principle of 2D Animation – Concept Development. 3D Animation & its Concepts – Types of 3D Animation – Skeleton & Kinetic 3D Animation – Texturing & Lighting of 3D Animation – 3D Camera Tracking – Applications & Software of 3D Animation.	<b>8</b>
<b>III</b>	Creating Animation in Flash: Introduction to Flash Animation – Introduction to Flash – Working with the Timeline and Frame-based Animation- Frame by frame animation, flip books, power of frames - Working with the Timeline and Tween-based Animation motion tween, Motion editor, shape tweens, Masks, Animating bones, using bitmap images– Understanding Layers - Actionsript.	<b>8</b>

### Teaching methods:

Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

## TEXT BOOKS

1. Ranjan Parekh. *Principles of Multimedia*. Tata McGraw Hill Publishing, 2008.
2. Shalini Gupta & Adity Gupta, *Flash 8 in Simple Steps –2007*, dreamtech.

## REFERENCE BOOKS

1. Todd Perkins, *Flash Professional CS5 Bible*. Wiley Dreamtech India Pvt Ltd, 2010.
2. Tom Meade, Shinsaku Arima, *MAYA 8.0 THE COMPLETE REFERENCE - TMH*.


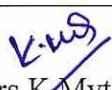
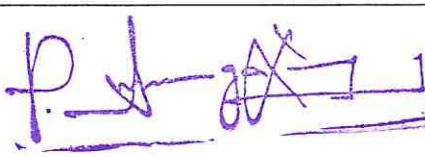
## MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 Mrs.D.Mythili	 Mrs.K.Mythili	

**K. MYTHILI** M.Sc., M.Phil., (Ph.D)  
Associate Professor & HOD  
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Co-ordinator  
Academic Audit Cell  
Hindusthan College of Arts & Science,  
Coimbatore-641 028.

<b>Course Code:</b>		<b>Digital Marketing</b>						<b>Batch:</b>	<b>2020-2021</b>
<b>Hrs/Week:</b>	<b>2</b>	<b>L</b>	<b>2</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>-</b>	<b>Semester:</b>	<b>-</b>
								<b>Credits:</b>	

**COURSE OBJECTIVE:**

- To provide the knowledge of digital marketing and its importance for marketing success, to develop a plan, digital channels and Google Ad Words campaigns.
- The social media planning and implement the knowledge Analytics of digital marketing.

**COURSE OUTCOME:**

<b>S.No</b>	<b>COURSE OUTCOME</b>	<b>BLOOMS LEVEL</b>
CO1	Remember and Comprehend basic marketing concepts.	K1
CO2	Classify the importance of conversion and working with digital relationship marketing.	K2
CO3	Build the confluence of marketing, operations, and human resources in real-time delivery.	K3
CO4	Examine and evaluate issues in adapting to globalised markets that are constantly changing and increasingly networked.	K4



	<b>Digital Marketing</b>	<b>Sem:</b>
<b>Unit No.</b>	<b>Topics</b>	<b>Hours</b>
<b>I</b>	Principles of Digital Marketing: Basics of Marketing-What is Digital Marketing?-Comparison of Traditional and Digital Marketing-Statistics of Digital Marketing- Benefits of Digital marketing-Latest Digital marketing trends-Digital marketing platforms-Digital Marketing strategy for websites-Career opportunities in digital marketing	<b>8</b>
<b>II</b>	Social Media Marketing: Introduction to social media marketing-Facebook marketing-Facebook advertising- YouTube marketing-Twitter marketing- LinkedIn marketing-Instagram Marketing-Document Sharing Site  Email Marketing: What is Email Marketing-Benefits of email marketing-Basic terminology in email marketing-Email Marketing software.	<b>8</b>
<b>III</b>	Google AdSense and Affiliate Marketing: Online money earning strategies-Success stories of online entrepreneurs-Planning a website for Adsense-What is Adsense?-Types of Bidding-Implementing Ads in a Website-What is Affiliate Marketing-Types of Affiliate Marketing-Making Money using Affiliate Marketing-Popular Affiliate Networks-Freelancing Business Strategies.	<b>8</b>

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

#### **TEXT BOOKS**

1. *Kevin Urrutia & Wilson Lin, "Digital Marketing Made Easy", FORBES, Kindle Edition.*

#### **REFERENCE BOOKS**

1. [https://www.amazon.com/dp/B08B5JW2SR/ref=rdr\\_kindle\\_ext\\_tmb](https://www.amazon.com/dp/B08B5JW2SR/ref=rdr_kindle_ext_tmb)

#### **WEB RESOURCES**

1. <https://blendinfotech.com/digital-marketing-course-syllabus/India>
2. [https://www.deccansoft.com/Documents/SyllabusDocs/7f53e17e-b4a1-45d2-b3b0-bafd2a504d27 Syllabus of Digital Marketing.pdf](https://www.deccansoft.com/Documents/SyllabusDocs/7f53e17e-b4a1-45d2-b3b0-bafd2a504d27%20Syllabus%20of%20Digital%20Marketing.pdf)


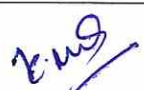
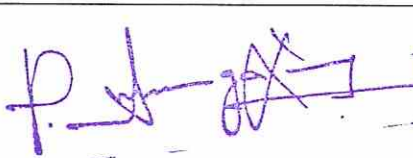


## MAPPING WITH PROGRAM OUTCOMES

CO	PO	PO1	PO2	PO3	PO4
C01		L	M	M	L
C02		M	L	L	M
C03		M	S	L	S
C04		S	M	S	L

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 Mr.G.Ravishankar	 Mrs.K.Mythili	

**K. MYTHILI M.Sc., M.Phil., (Ph.D)**  
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**Co-ordinator**  
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Course Code		PHP Programming						Batch	2020-2021
								Semester	
Hrs/Week	2	L	2	T	-	P	-	Credits	

### COURSE OBJECTIVE:

To provide the necessary knowledge to design and develop dynamic, database-driven web applications using PHP

### COURSE OUTCOME :

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Identify Client and Server side Scripting languages	K3
CO2	Demonstrate PHP programs that use various PHP library functions, and that manipulate files and directories	K2
CO3	Analyze and solve various database tasks using the PHP language	K4
CO4	Construct a complete website	K6

PHP Programming		
Unit No.	Topics	Hours
I	Introducing PHP: What is PHP – What is Mysql – Developing a Web Application Platform: Html Embeddedness – Cross platform compatibility – stability – Fast Feature Development – Strong User Communities. Server side Scripting Overview – Static HTML – Client Side technologies – Server Side Scripting – what is Server-side Scripting	8
II	Getting Started with PHP : Installing PHP : Installation procedures – Installing PHP on CentOS - Installing PHP on Debian - Installing PHP From Source – Microsoft Windows and Apache- Other Web servers – Developments tools – Canonical PHP Tags – Hello world – Jumping IN & Out of PHP Mode – including files	8
III	Learning PHP Syntax and variables – Comments – Variables – Variable scope – Constants – Type Declaration – Automatic Type conversion – The simple types – Integers – Double – Boolean – NULL – Strings – Echo and print. Boolean Expression – Operators – Branching – Looping – Simple Mathematic Functions – Randomness.	8

### Teaching methods:

Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

## TEXT BOOKS

1. Steve Suehring Tim Converse and Joyce Park - PHP6 and MySQL Bible- Wiley-India. New Delhi 2009.

## REFERENCE BOOKS

1. Dacie Cristian- Pack Pub AJAX and PHP - 2006
2. Scouarnec Yann- Stolz Jeremy Jeremy and Glass Michael - Beginning PHP5- APACHE- MYSQL Web Development - Wiley-India New Delhi- 2005


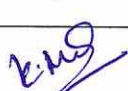
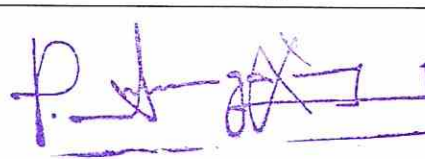
## MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 Dr.C.Thirumoorthi	 Mrs.K.Mythili	

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Co-ordinator  
Academic Audit Cell  
Hindusthan College of Arts & Science,  
Coimbatore-641 028

<b>Course Code:</b>		<b>Block Chain Technology</b>						<b>Batch:</b>	<b>2020-2021</b>
								<b>Semester:</b>	
<b>Hrs/Week:</b>	2	<b>L</b>	<b>2</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>-</b>	<b>Credits:</b>	

**COURSE OBJECTIVE:**

This course covers the technical aspects of public distributed ledgers, blockchain systems, cryptocurrencies, and smart contracts.

**COURSE OUTCOME:**

<b>S.No</b>	<b>COURSE OUTCOME</b>	<b>BLOOMS LEVEL</b>
CO1	Apply the Knowledge how to securely interact with them	K3
CO2	Design, build, and deploy smart contracts and distributed applications	K6
CO3	Explain how block chain systems work and its Applications	K2
CO4	Analyze ideas from block chain technology into their own projects.	K4



		<b>Sem:</b>
<b>Unit No.</b>	<b>Topics</b>	<b>Hours</b>
<b>I</b>	<b>Blockchain :</b> Introduction, Advantage over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, Chain Policy, Life of Blockchain application, Soft & Hard Fork, Private and Public blockchain.	<b>8</b>
<b>II</b>	<b>Distributed Consensus:</b> Nakamoto consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficulty Level, Sybil Attack, Energy utilization and alternate. <b>Cryptocurrency:</b> Bitcoin protocols - Mining strategy -GHOST.	<b>8</b>
<b>III</b>	<b>Cryptocurrency Regulation:</b> Stakeholders, Roots of Bit coin, Legal Aspects-Crypto currency Exchange, Black Market and Global Economy. <b>Applications:</b> Internet of Things, Medical Record Management System, Domain Name Service and future of Blockchain.	<b>8</b>

**Teaching methods:**

Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

## TEXT BOOKS

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, *Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction*, Princeton University Press (July 19, 2016).

## REFERENCE BOOKS

1. Antonopoulos, *Mastering Bitcoin: Unlocking Digital Cryptocurrencies*
2. Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System*


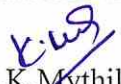

## MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 Mrs. T. Kavipriya	 Mrs. K. Mythili	

**K. MYTHILI M.Sc., M.Phil., (Ph.D)**  
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Co-ordinator  
Academic Audit Cell  
Hindusthan College of Arts & Science,  
Coimbatore-641 028.

<b>Course Code:</b>		<b>Multimedia and its Applications</b>					<b>Batch:</b>	<b>2020-2021</b>
<b>Hrs/Week:</b>	<b>2</b>	<b>L</b>		<b>T</b>		<b>P</b>		
							<b>Credits:</b>	

**COURSE OBJECTIVE:**

- Introduce the fundamental elements of multimedia.
- Acquire the Knowledge on representations, perceptions and applications of multimedia.
- Develop Software skills and hands on digital media.

**COURSE OUTCOME:**

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Classify the technologies behind multimedia applications	K2
CO2	Explain the key concepts in current multimedia technology and to create quality multimedia software titles.	K5
CO3	Analyze Video and Animation Techniques	K4
CO4	Develop the skills to build multimedia projects.	K3

		<b>Sem:</b>
<b>Unit No.</b>	<b>Topics</b>	<b>Hours</b>
<b>I</b>	<p><b>Introduction to Multimedia Computer Fonts and Hypertext :</b></p> <p>What is multimedia, Components of multimedia, Web and Internet multimedia applications. Usage of text in Multimedia, Families and faces of fonts, International character sets and hypertext, Digital fonts techniques.</p>	<b>8</b>
<b>II</b>	<p><b>Audio and Image fundamentals and representations:</b></p> <p>Digitization of sound, frequency and bandwidth, decibel system, data rate, audio file format, Sound synthesis, MIDI, Adding sound to your multimedia project, Audio software and hardware. Colour Science , Colour, Colour Models, Colour palettes, Dithering, 2D Graphics, Image Compression and File Formats , Use of image editing software, Gamma correction, Photo Retouching.</p>	<b>8</b>
<b>III</b>	<p><b>Video and Animation :</b></p> <p>Video Basics , How Video Works, Broadcast Video Standards, Video Recording and Tape formats, Shooting and Editing Video (Use Adobe remier for editing), Video Compression and File Formats. Animation: Cell Animation, Computer Animation, Morphing. Some Authoring Tools, Macromedia Director &amp; Flash.</p>	<b>8</b>

**Teaching methods:**

Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.



## TEXT BOOKS

1. Tay Vaughan, "Multimedia making it work", Tata McGraw-Hill, 2008.
2. Rajneesh Aggarwal & B. B Tiwari, "Multimedia Systems", Excel Publication, New Delhi, 2007.

## REFERENCE BOOKS

1. Parekh Ranjan, "Principles of Multimedia", Tata McGraw-Hill, 2007
2. Anirban Mukhopadhyay and Arup Chattopadhyay, "Introduction to Computer Graphics and Multimedia", Second Edition, Vikas Publishing House.

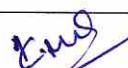
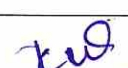
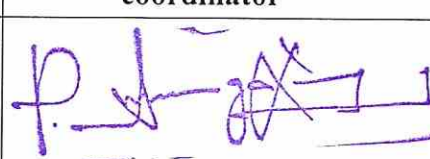
## MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 Mrs.K.Mythili	 Mrs.K.Mythili	

**K. MYTHILI** M.Sc., M.Phil., (Ph.D)  
Associate Professor & HOD  
Department of Computer Technology  
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Coimbatore - 641 028.

**Co-ordinator**  
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Hindusthan College of Arts & Science,  
Coimbatore-641 028.

Course Code		E Learning						Batch	2020-2021
								Semester	
Hrs/Week	2	L	2	T	-	P	-	Credits	

**COURSE OBJECTIVE:**

- Augment the quality of learning and teaching
- Meet the learning style or needs of students to the novel scenario
- Application Ability to use learned material in new situations.

**COURSE OUTCOME:**

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Find knowledge about the various E-learning Techniques	K1
CO2	Explain the importance of E-learning	K2
CO3	Apply the deployment of E-learning	K3
CO4	Examine and evaluate issues in E-learning	K4

E Learning		
Unit No.	Topics	Hours
I	<b>E-Learning – Introduction</b> History of E-Learning, Benefits of E-Learning, Unleashing E-Learning, E-Learning for Whom, E-Learning Checklist, Benefits of E-Learning , Methods of E-Learning	8
II	<b>Potential of E Learning</b> Advantages And Disadvantages of E-Learning, Preparing for E-Learning , Types of E-Learning Training, Benefits of E-Learning for Organization	8
III	<b>Deployment of E Learning and Tools</b> Using an LMS, Learning theories, Application of Learning theory (education) to E-Learning, Teacher use of technology, Exemplification of E Learning tools	8

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

## TEXT BOOKS

1. *Text Book Sasikala, "Perspectives of E-Learning", TPH Publishers*
1. *Dr.S.Sasikala, "Perspectives of E-Learning", TPH Publishers.*

## REFERENCE BOOKS

1. *W. Allen, " Guide to E-Learning: Building Interactive, Fun, and Effective Learning Programs for Any Company", KOBO*
2. *Richard E. Mayer and Ruth C. Clark, E-Learning and the Science of Instruction: Proven Guidelines for Consumer and Designers of Multimedia Learning, Wiley*

## WEB RESOURCES

Web Link:

<https://elearningindustry.com/deploy-effective-corporate-compliance-training-with-user-friendly-lms-free-ebook>

## MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 Dr.S.Sasikala	 Mrs.K.Mythili	

**K. MYTHILI M.Sc., M.Phil., (Ph.D)**  
**Associate Professor & HOD**  
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Co-ordinator  
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Course Code		Network Administration & Troubleshooting						Batch	2020-2021
								Semester	
Hrs/Week	2	L	2	T	-	P	-	Credits	

### COURSE OBJECTIVE:

- Explore the various technologies of computer networks and Network administration
- Define key terms and critical concepts of trouble shooting.
- Enumerate the phases of the security systems development life cycle and Describe the information security roles of professionals within an organization

### COURSE OUTCOME:

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Recall the Technologies of Networking	K1
CO2	Apply and experiment the concepts network administration.	K3
CO3	Categorize the essential systems administration skills related to server operating systems, system and network service administration, computer and information security, and directory services administration.	K4
CO4	Relate the network security and troubleshooting concepts and network access control mechanisms.	K2

Network Administration & Troubleshooting		
Unit No.	Topics	Hours
I	<b>Network Topologies and Technologies:</b> Network Topologies: Bus, Star, Ring, Point-to-point, Ethernet networks and Standards, WIFI, Token Ring Networks, Wireless Access Point, Advanced features of NIC.	8
II	<b>Network Operating System Fundamentals:</b> Operating system fundamentals, Network Operating System-Role of Client and Server Operating System, Centralized User Account and computer management, Server and Network Fault Tolerance. Operating System Virtualization, Installing an OS	8
III	<b>Network Management and Administration:</b> Managing user and group accounts – Storage and file system management – Working with shared files and printers – Backup and fault tolerance. <b>Troubleshooting:</b> Network troubleshooting tools – Troubleshooting situations – Disaster recovery.	8



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

### TEXT BOOKS

*Book Sasikala, "Perspectives of E-Learning", TPH Publishers*

*Gregory Tomsho, "Guide to Networking Essentials 6e", Cengage Learning*

### REFERENCE BOOKS

1. *Michael Parmer, "Hands On Networking Essentials", Cengage Learning*
2. *Paul Browning, CISCO CCNA simplified, Cisco Press*

### MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

### ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 Mrs.K.Mythili	 Mrs.K.Mythili	

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

<b>Course Code:</b>		<b>VM Ware</b>						<b>Batch:</b>	<b>2020-2021</b>
								<b>Semester:</b>	
<b>Hrs/Week:</b>	2	<b>L</b>	<b>2</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>-</b>	<b>Credits:</b>	

**COURSE OBJECTIVE:**

- Identify the need for Data Center Virtualization.
- Describe the Components and Features of Vsphere

**COURSE OUTCOME:**

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Explain the concepts of Virtualization Technology.	K5
CO2	Discuss Vsphere components and their function.	K6
CO3	Demonstrate an ESXi host.	K2
CO4	Build Vmware Applications.	K3

	<b>VM Ware</b>	
<b>Unit No.</b>	<b>Topics</b>	<b>Hours</b>
<b>I</b>	Introduction to Virtualization Technologies - VMware workstation - VMware player - Virtual box. Introduction to VMware Virtualization - Introduce Virtualization - Introduce Virtual machines - Introduce vSphere components . VMware ESX and ESXi ( ESX/ESXi - Introduce the architecture of ESX and ESXi - Manually configure ESX/ESXi - VMware vCenter Server - Install and configure vCenter Server components -Manage vCenter Server inventory objects.	<b>8</b>
<b>II</b>	Networking - Create, configure, and manage vNetwork standard switches - Create, configure, and manage network connections - Create, configure, and manage port groups - Storage - Configure ESX/ESXi with iSCSI, NFS,- Create and manage vSphere datastores. Virtual Machines -Deploy virtual machines using the Create New Virtual Machine wizard, templates, cloning, and VMware vCenter Converter - Modify and manage virtual machines - Perform Storage vMotion migrations 8. Access Control - Control user access through roles and permissions.	<b>8</b>

<b>III</b>	Resource Monitoring - Control virtual machine access to CPU, memory, and I/O resources-Introduce VMkernel methods for optimizing CPU and memory usage - Monitor resource usage using vCenter Server performance graphs and alarms - Data Protection -Back up and recover virtual machines using VMware Data Recovery . Scalability - Manage multiple vCenter Server inventories using VMware vCenter Linked Mode - Manage ESX/ESXi configuration compliance using Host Profiles - Create, configure, and manage vNetwork distributed switches, network connections, and port groups - Perform VMware vMotion migrations -Configure and manage a VMware Distributed Resource Scheduler cluster. High Availability - Configure and manage a VMware High Availability cluster - Configure fault-tolerant virtual machines using VMware Fault Tolerance.	<b>8</b>
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**Teaching methods:**

Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

**REFERENCE BOOKS**

Mastering VMware vSphere 6 | Edition:Reprint 2015 | Sybex | GrantOrchard AND JoshAtwell AND NickMarshall AND ScottLowe(2015)

**WEB RESOURCES**

[www.vmware.com](http://www.vmware.com)


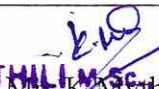

**MAPPING WITH PROGRAM OUTCOMES**

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

S-Strong, M- Medium, L – Low

**ASSESSMENT PATTERN**

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 Dr.C.Thirumoorthi	 <b>Mrs. K. Mythili</b> <b>Associate Professor &amp; HOD</b> <b>Department of Computer Technology</b> <b>Hindusthan College of Arts and Science (Autonomous)</b> <b>Coimbatore - 641 028.</b>	 <b>Co-ordinator</b> <b>Academic Audit Cell</b> <b>Hindusthan College of Arts &amp; Science,</b> <b>Coimbatore-641 028</b>



<b>Course Code:</b>		<b>Project Management</b>						<b>Batch:</b>	<b>2020-2021</b>
							<b>Semester:</b>	<b>-</b>	
<b>Hrs/Week:</b>	<b>2</b>	<b>L</b>	<b>2</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>-</b>	<b>Credits:</b>	

**COURSE OBJECTIVE:**

- To Deliver successful projects that support organization's strategic goals and create project plans that address real-world management challenges
- To Develop the skills for tracking and controlling and deliverables

**COURSE OUTCOME:**

<b>S.No</b>	<b>COURSE OUTCOME</b>	<b>BLOOMS LEVEL</b>
CO1	Find the exposure for organizing and managing a project.	K1
CO2	Classify the model from the conventional product to the modern world.	K2
CO3	Analyze and design the software architecture.	K4
CO4	Apply, identify, select and develop the model project.	K3



Project Management		
Unit No.	Topics	Hours
I	<b>Basics of Project Management:</b> Introduction, Need for Project Management, Project Management Knowledge Areas and Processes, The Project Life Cycle, The Project Manager (PM), Phases of Project Management Life Cycle, Project Management Processes.	8
II	<b>Project Identification and Selection:</b> Introduction, Project Identification Process. Project Planning: Introduction, Project Planning, Need of Project Planning.	8
III	<b>Organizational Structure and Organizational Issues:</b> Introduction, Concept of Organizational Structure, Roles and Responsibilities of Project Leader, Relationship between Project Manager and Line Manager, Leadership Styles for Project Managers.	8

#### Teaching methods:

Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

#### TEXT BOOKS

1. Project Management Absolute Beginner's Guide 3<sup>rd</sup> Edition by Greg Horine.

#### REFERENCE BOOKS

1. A Guide to the Project Management Body of Knowledge the PMBOK Guide 5<sup>th</sup> Edition.

#### WEB RESOURCES

**Web Link:** <http://ptgmedia.pearsoncmg.com/images/9780789750105/samplepages/0789750104.pdf>


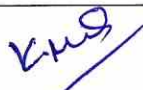

#### MAPPING WITH PROGRAM OUTCOMES

CO	PO	PO1	PO2	PO3	PO4
	CO1	S	S	S	M
	CO2	S	S	S	S
	CO3	S	S	S	M
	CO4	S	S	S	S

S-Strong, M- Medium, L – Low

**ASSESSMENT PATTERN**

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

Course Designed by	Verified by HOD	Approved by CDC coordinator
 B. Yazhini	 Mrs.K.Mythili	

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