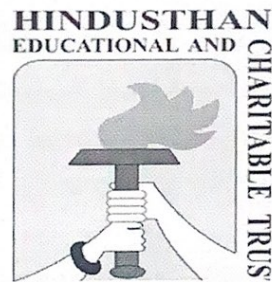


**LEARNING OUTCOMES–BASED CURRICULUM  
FRAMEWORK (LOCF)**

in the

**UNDERGRADUATE PROGRAMME  
Bachelor of Science in Information Technology**

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



**HICAS**

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

(Affiliated to Bharathiar University and Accredited by NAAC)

**COIMBATORE-641028**

**TAMILNADU, INDIA.**

Phone: 0422-4440555

Website: [www.hindusthan.net/hicas/](http://www.hindusthan.net/hicas/)

## HINDUSTHAN COLLEGE OF ARTS AND SCIENCE

### DEPARTMENT OF INFORMATION TECHNOLOGY

#### PREAMBLE

Learning Outcome Based Curriculum Framework for Undergraduate education in Bachelor of Science in Information Technology

The intent of this programme is to produce graduates who are able to have higher-level thinking and creativity through Information and Communication Technology.

#### VISION

“To become a globally recognized centre of excellence in the field of Information Technology, providing technology excellence that advances learning, teaching, research to produce budding IT professionals, researchers, innovators and entrepreneurs.”

#### MISSION

The Department of Information Technology (IT) strives to provide quality and competency-based education and research activities through necessary infrastructure and fine-tune the younger generation to congregate the challenges ahead with courage.

#### **Programme Educational Objectives (PEO)**

Under Graduates of Information Technology programme will

**PEO1:** Provide solutions to challenging problems in their profession by applying Computer Sciencetheory and principles.

**PEO2:** Engage in life-long learning and professional development to adapt to rapidlychanging work environment.

**PEO3 -** Enable students to develop communication, teamwork and leadership skills necessary to build their career.

**PEO4-** Able to adapt innovative practices and contribute towards research and technological development in the field of Information Technology through Total Quality Education



**PROGRAMME OUTCOME (PO) :**

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

**PO2:** 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 of Computer field.

**PROGRAMME SPECIFIC OUTCOME (PSO):**

**PSO1:** Understand, analyse and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics and Networking for efficient design of computer-based systems of varying complexity.

**PSO2:** Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions to existing problems.

**PSO3:** Apply standard Software Engineering practices and strategies in software project development using open-source programming environment to deliver a quality product for business success.

**PSO4:** An ability to use knowledge in various domains to identify real world problems and hence to provide solution to new ideas and innovations.

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

**SCHEME OF EXAMINATIONS - CBCS & LOCF PATTERN**  
*(For the Students admitted from the Academic year 2020-2021 and onwards)*

**UG PROGRAMME**

**Programme: B.Sc. Information Technology**

Part	Course Code	Course Type	Course Title	Lecture Hours/week	Exam Duration (hours)	MAX. MARKS			CREDIT POINTS
						IE	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	20ITU01	DSC	Fundamentals of Computing and C Programming	5	3	30	70	100	5
III	20ITU02	DSC	Computer System Architecture	4	3	30	70	100	4
III	20ITMU02	DSC	<b>Linux Administration with Scripting</b>			50	50		
III	20ITU03	GE	Allied: Mathematics for Computing	5	3	30	70	100	4
III	20ITU04	DSC	Practical - I: Programming using C	4	3	40	60	100	2
IV	20ITUV01	ACC	VAC-I	2	1	50	-	50	Grade*
IV	20ITUJ01	AEE	Communicative Skills	2	1	50	-	50	Grade*
IV	20ITUJ02	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	20ITU05	DSC	Data Structures and Algorithms	4	3	30	70	100	3
III	20ITU06	DSC	Python Programming	3	3	30	70	100	3
III	20ITMU06	DSC	<b>Introduction to Programming using Python</b>			50	50		
III	20ITU07	GE	Allied: Numerical Methods	5	3	30	70	100	4
III	20ITU08	DSC	Practical - II: Data Structures using Python	4	3	40	60	100	2
IV	20GSU01	AECC	Value Education – Human Rights	2	2	100	-	100	2



IV	20ITUV02	ACC	VAC-II	2	1	50	-	50	Grade*
IV	20ITUJ03	AEE	Communicative Skills	2	1	50	-	50	Grade*
IV	20ITUJ04	AEE	Soft Skill	2	1	50	-	50	Grade*
<b>Semester – III</b>									
III	20ITU09	DSC	Programming with JAVA	5	3	30	70	100	5
III	20ITU10	DSC	Network Security and Cryptography	5	3	30	70	100	5
III	20ITU11	DSC	Software Engineering	4	3	30	70	100	4
III	20ITMU11	DSC	Big Data and Data Science – R Programming			50	50		
III	20ITU12	GE	Allied: Operations Research	5	3	30	70	100	4
III	20ITU13	DSC	Practical -III: Programming using JAVA	6	3	40	60	100	3
III	20ITU14	SEC	Practical -IV: Networking Security Lab	3	3	40	60	100	2
IV	20GSU02	AECC	Environmental Studies	2	2	100	-	100	2
IV	20ITUV03	ACC	VAC-III	2	1	50	-	50	1
IV	20ITUJ05	SEC	Aptitude / Placement Training	2	1	50	-	50	Grade*
IV	20ITUJ06	SEC	Online Classes	2	1	-	-	-	C/NC* *
<b>Semester – IV</b>									
III	20ITU15	DSC	Relational Database Management System	6	3	30	70	100	6
III	20ITMU15	DSC	Database Administration Fundamentals			50	50		
III	20ITU16	DSC	Operating System	6	3	30	70	100	6
III	20ITU17	DSC	Practical - V: RDBMS Applications	6	3	40	60	100	3
III	20ITU18	GE	Allied: Business Accounting	5	3	30	70	100	4
III	20ITU19	SEC	Practical - VI: Mobile Application Development	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	20ITUV04	ACC	VAC-IV	2	1	50	-	50	1
IV	20ITUJ07	SEC	Aptitude / Placement Training	2	1	50	-	50	Grade*
IV	20ITUJ08	SEC	Online Classes	2	1	-	-	-	C/NC* *
<b>Semester – V</b>									
III	20ITU20	DSC	.NET Programming	6	3	30	70	100	5

III	20ITU21	DSC	Data Mining & Warehousing	6	3	30	70	100	5	
III	20ITMU21	DSC	Machine Learning			50	50			
III	20ITU22	DSC	Practical - VII: Programming using .NET	6	3	40	60	100	3	
III	20ITU23A	DSE	Elective I: Software Testing	6	3	30	70	100	5	
	20ITU23B		Elective I: Cloud Computing							
	20ITU23C		Elective I: E- Commerce							
III	20ITU24	SEC	Practical - VIII: Data Analytics	6	3	40	60	100	3	
III	20ITMU24	SEC	Artificial Intelligence			50	50			
IV	20GSU05	AECC	Non-Major Elective: General Awareness	-	2	100	-	100	2	
V	20GSU06	AECC	Law of Ethics	-	2	100	-	100	2	
IV	20ITUV05	ACC	VAC-V	2	1	50	-	50	1	
IV	20ITUJ09	SEC	Aptitude / Placement Training	2	1	50	-	-	Grade*	
IV	20ITUJ10	SEC	Online Classes	2	1	-	-	-	C/NC* *	
<b>Semester – VI</b>										
III	20ITU25	DSC	Open Source Tools	5	3	30	70	100	5	
III	20ITU26A	DSE	Elective II: Internet of Things	5	3	30	70	100	5	
	20ITU26B		Elective II: Computer Installation & Servicing							
	20ITU26C		Elective II: Artificial Intelligence and Expert Systems							
III	20ITU27	DSC	Practical - IX: Open Source Tools	6	3	40	60	100	3	
III	20ITU28A	DSE	Elective III: Big Data Analytics	5	3	30	70	100	5	
	20ITU28B		Elective III: Information Security							
	20ITU28C		Elective III: Digital Image Processing							
III	20ITU29	SEC	Practical - X: Software Testing Tools	5	3	40	60	100	3	
III	20ITU30	DSC	Project Work	4	-	40	60	100	4	
IV	20ITUV06	ACC	VAC-VI	2	1	50	-	50	1	
IV	20ITUJ11	SEC	Aptitude / Placement Training	2	1	50	-	-	Grade*	
IV	20ITUJ12	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	<b>Courses offered by the Departments (Additional Credit Courses)</b>
	a) Digital Marketing
	b) Network Reconnaissance
	c) VM Ware
	d) Animation and its Technique
	e) Multimedia and its Applications
	f) Network Administration and Trouble shooting
	g) Project Management
	h) Mongo DB
	i) Block Chain Technology
	j) E-Learning

List of Elective Papers/ DSE (Can choose any one of the paper as electives)		
	Course Code	Title
Electives/ DSE-I	20ITU23A	Elective I: Software Testing
	20ITU23B	Elective I: Cloud Computing
	20ITU23C	Elective I: E – Commerce
Electives/ DSE-II	20ITU26A	Elective II: Internet of Things
	20ITU26B	Elective II: Computer Installation & Servicing
	20ITU26C	Elective II: Artificial Intelligence and Expert Systems
Electives/ DSE-III	20ITU28A	Elective III: Big Data Analytics
	20ITU28B	Elective III: Information Security
	20ITU28C	Elective III: Digital Image Processing



## ABSTRACT FOR SCHEME OF EXAMINATIONS

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

S.No.	Part	Course (MIL/AECC/AEE/DSC/DSE/SEC/GE/ACC)	Papers	Credit	Total Credits	Marks	Total Marks
1	Part I	Modern Indian Language(MIL)	2	3	6	100	200
2	Part II	Ability Enhancement Compulsory course(AECC)	2	3	6	100	200
3	Part III	Discipline Specific course(DSC)	19	2/3/4/5	76	100	1900
		Generic Elective(GE)	4	4	16	100	400
		Discipline Specific Elective(DSE)	3	5	15	100	300
		Skill Enhancement Course(SEC)	4	2/3	11	100	400
4	Part IV	Additional Credit Course (ACC)	6	1	4	50	300
		Skill Enhancement Course(SEC)	8	-	-	50	100
		Ability Enhancement Elective (AEE)	4	-	-	50	200
		Ability Enhancement Compulsory course(AECC)	4	2	8	100	400
5	Part V	Ability Enhancement Compulsory course(AECC)	2	2	2	100	200
<b>Total</b>			<b>58</b>	<b>-</b>	<b>140*</b>	<b>950</b>	<b>4600</b>

\*Excluding Additional Credit Course(ACC) Credit Points(4)

  
Syllabus Co-Ordinator

  
BOS Chairman

  
Academic Council - Member Secretary

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

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

### 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 96% and above - 30 marks 91% to 95% - 25 marks 86% to 90% - 20 marks 75% 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>



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 with Microsoft & HP

### 1. 50-50 Pattern Policy:

#### a) 50 Marks Internals

Components	Marks
Class Assignment#	25
Class Attentiveness\$	15
Class Attendance*	10
<b>TOTAL</b>	<b>50</b>

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

- \* Below 75 = 0 mark
- \* Above 75-80 - 6 marks
- \* Above 80-85 - 7 marks
- \* Above 85-90 - 8 marks
- \* Above 90-95 - 9 marks
- \* Above 95-100 -10 marks

# - Minimum 10 Assignments

\$ - Interactive Session, Seminar participation, Attentiveness in Class

Components will be considered for Internal 50 Marks and divided by 2 and **Converted to 25 marks.**

#### b) Continuous Assessment Test:

- i. Tests will be conducted under 50 marks Pattern
- ii. Objective questions 50 x 1 mark each = 50 Marks
- iii. Best of 2 Continuous Assessment Test will be considered for Internal 50 Marks and divided by 2 and **Converted to 25 marks.**

(a+ b = 25+25= 50 marks)

### 2. 50 Marks Externals

- Online Exam with objective Pattern will be conducted
- Question Pattern will be objective with scenarios
- Approximately : 38 to 50 questions carry 100 marks = 100/2 = 50 Marks

### 3. Final Exam (Global Certification Exam)

- 50-50 Pattern will be followed
- Online Exam will be conducted for remaining 50 Marks
- Course completion Certificate will be issued for candidates securing more than 50% marks
- Global Certification will be issued for candidates securing more than 70% marks
- In case of Failure a candidate can take the exam after 24 hours after getting the results.



Course Code:	20ITU01	Course Title						Batch:	2020-2021 & onwards
		Fundamentals of Computing and C Programming						Semester:	I
Hrs/Week:	5	L	5	T	-	P	-	Credits:	5

<p><b>COURSE OBJECTIVE</b></p> <ul style="list-style-type: none"> <li>• Provide exposure to problem-solving through programming.</li> <li>• Learn the fundamentals of computing techniques.</li> <li>• Develop simple applications in 'C' language.</li> <li>• Understand logics that help to create programs.</li> </ul>
---

<b>COURSE OUTCOMES (CO)</b>
-----------------------------

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

## SYLLABUS

20ITU01	Fundamentals of Computing and C Programming	Sem: I
Unit No.	Topics	Hours
I	<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.	9
II	<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.	12
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 BOOKS

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

## REFERENCE BOOKS

- 1.E.Balaguruswami, " Programming in ANSI C", TMH 21<sup>st</sup> reprint 1998
- 2 .Y.Kanetkar, "Let us C", BPB Publications, 15<sup>th</sup> Edition 2017 revised.
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>

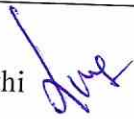
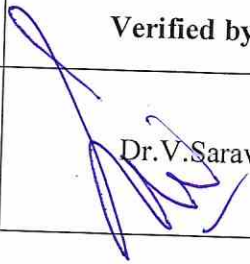

## MAPPING WITH PROGRAM OUTCOMES

PO CO	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 Co-coordinator
Mr.M.Karthi 	 Dr. V. Saravanan	

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



<b>Course Code:</b>	<b>20ITU02</b>	<b>Course Title</b>						<b>Batch:</b>	<b>2020-2021 &amp; onwards</b>
		<b>Computer System Architecture</b>						<b>Semester:</b>	<b>I</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>Credits:</b>	<b>4</b>

#### **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)**

<b>S.No</b>	<b>COURSE OUTCOME</b>	<b>BLOOMS LEVEL</b>
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

## SYLLABUS

20ITU02	Computer System Architecture	Sem: 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 : Intel 8086 Microprocessor</b>	9

*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. M. Morris Mano, "Computer System and Architecture", Pearson Education; Third edition reprint 2017*

## REFERENCE BOOKS

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

## WEB RESOURCES

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

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




## MAPPING WITH PROGRAM OUTCOMES

PO CO	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 Co-coordinator
Mrs.D.Mythili 	Mrs.K.Mythili 	

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



Course Code:	20ITMU02	Course Title						Batch:	2020-2021 & onwards
		Linux Administration with Scripting						Semester:	I
Hrs/Week:	4	L	4	T	-	P	-	Credits:	4

### COURSE OBJECTIVE

- Basics of Linux, User management, Disk Management, Package Management, Server Management, Security Implementation Scripting

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Outline Linux Operating system with particular emphasis on command line tools, utilities and shell scripting.	K2
CO2	Discuss about shell concepts and use of shell features.	K6
CO3	Apply the various commands and utilities related to file system management.	K3
CO4	Analyze the relevant information from a variety of sources.	K4

**SYLLABUS**

20ITMU02	Linux Administration with Scripting	Sem: I
Unit No.	Topics	Hours
I	Linux Basics : Access the command line – Log in to a Linux system and run simple commands using the Shell – Manage files from the command line – copy,move,create,delete and organize files from the bash shell prompt – Get help in Red Hat Enterprise Linux – Resolve problems by using online help systems and Red Hat support utilities – Create, View and edit text files – Create, view and edit text files from command output or in an editor – Manage local Linux users and groups – Administer local password policies – Control access to files with Linux file system permissions – Set Linux files system permissions on files and interpret the security effects of different permission settings – Monitor and manage Linux processes – Obtain information about the system and control processes running on it – Control services and daemons.	9
II	Control and monitor network services and system daemons using system configure and secure OpenSSH service – Access and provide access to the command line on remote systems securely using OpenSSH – Analyze and store logs – Locate and accurately interpret relevant system log files for troubleshooting purposes – Managed Red Hat Enterprise Linux networking – Configure basic IPv4 networking on Red Hat Enterprise Linux systems – Archive files and copy them from one system to another – Install and update software packages – Download,install,update and manage software packages from Red Hat and yum packages repositories – Access Linux file systems – Access and inspect existing file systems on a Red Hat Enterprise Linux system – Use virtualized systems – Create and use Red Hat Enterprise Linux virtual machines with KVM and libvirt.	10
III	LINUX Administration, Server and Security: Automate installation of red Hat Enterprise Linux system with kickstart – Use regular expressions with grep – Write regular expressions that, when partnered with grep, will allow you to quickly isolate or locate content within text files – Create and Edit text files with vim. Introduce the vim text editor with which you can open, edit and save text files – Schedule future Linux tasks – Schedule tasks to automatically execute in the future – Manage priority of Linux processes – Influence the relative priorities at which Linux processes run – Control access to files with access control lists (ACL) – Manage file security using POSIX access control lists – Manage SELinux security – Manage the Security using POSIX access control lists – Manage SELinux security – Manage the Security Enhanced Linux (SELinux) behaviour of a system to keep it secure in case of a network service compromise – Connect to network-defined users and groups – Configure systems to use central identity management services – Add disks, partitions and file systems to a Linux system – Manage simple partitions and life systems.	10



IV	Manage logical volume management (LVM) storage – Manage logical volumes from the command line. Access networked attached storage with network file system(NFS) – Access (secure) NFS Shares. Access networked storage with SMB – Use autofs and the command line to mount and unmount SMB file system – Control and troubleshoot the Red Hat Enterprise Linux boot process – Limit network communication with firewall – Configure a basic firewall.	10
V	Linux Administration, Server and Shell Scripting: Control services and daemons – Review how to manage services and boot-up process using system – Manage IPv6 networking – Configure and troubleshoot basic IPv6 networking on Red Hat Enterprise Linux systems – Configure link aggregation and bridging – Configure and troubleshoot advanced network interface functionality including bonding, teaming and local software bridges – Control network port security – Permit and reject access to network services using advanced SELinux and firewall filtering techniques – Manage DNS for servers – Set and verify correct DNS records for systems and configure secure DNS caching – Configure email delivery – Relay all email sent by the system to an SMTP gateway for central delivery – Provide block-based storage – Provide and use networked iSCSI block devices as remote disks – Provide file- based storage – Provide NFS exports and SMB file shares to specific systems and users – Configure MariaDB databases – Provide a MariaDB SQL database for use by programs and database administrators – Provide Apache HTTPD web service – Configure Apache HTTPD to provide Transport Layer Security (TLS) enabled websites and virtual hosts – Write Bash scripts – Write simple shell scripts using Bash – Bash conditionals and other control structures to write more sophisticated shell commands and scripts – Configure the shell environment – Customize Bash start up and use environment variables, Bash aliases and Bash functions – Linux containers preview – Preview the capabilities of Linux containers, Docker and other related technologies in Red Hat Enterprise Linux 7.	9

*Note: Distribution of marks for Internal Examination -50 and External Examination -50*

**Teaching methods:**

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

**TEXT BOOKS**

1. *LINUX ADMINISTRATION WITH SCRIPTING - certipoint( Pearsonvue publications) 2019 Edition*

**REFERENCE BOOKS**

1. *Linux For Beginners* by Jason Cannon.
2. *The Linux Command Line : A Complete Introduction* by William Shotts.




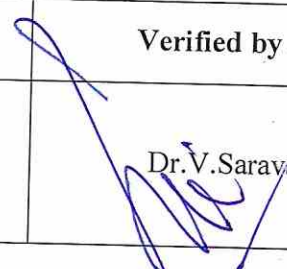

## MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

Follows Track -2 Industry Oriented (Microsoft & HP) pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
 Ms. G. SivaBrindha	 Dr. V. Sarayanan	

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

Course Code:	20ITU04	Course Title						Batch:	2020-2021 & onwards
		Practical – I : Programming using C						Semester:	I
Hrs/Week:	4	L	4	T	-	P	4	Credits:	2

#### COURSE OBJECTIVE

- 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	Choosethe 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**

20ITU04	Practical – I: Programming using C	Sem: I
Ex. No.	Program List	Hours
1	Program to develop a Simple Calculator using switch case.	4
2	Program to print the Alphabet A to E and reverse the same decreasing one by one line by line using for Loop.	4
3	Program to sort numbers in Ascending and descending order using Arrays..	4
4	Program to accept two number from user and swap the values using call by reference method	4
5	Program to find the Prime numbers between two integers using functions	4
6	Program to implement Matrix operations Addition, Subtraction and Multiplication – using functions.	4
7	Program to generating Fibonacci Numbers using recursive functions	4
8	Program for String manipulations without using string functions (string length, string comparison, string copy) (Using function pointers).	4
9	Define a structure Employee having elements emp_id, name, DOB, DOJ etc. Accept data and reprint it. (use structure within structure)	4
10	Program to implement dynamic memory allocation.	4
11	Program to write the content into a file, read the content from the same file and display it.	4
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.	4

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

**Teaching methods:**

PowerPoint Projection through LCD, Demonstration



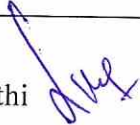

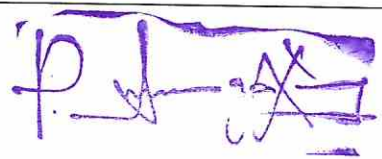
## MAPPING WITH PROGRAM OUTCOMES

PO CO	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 Co-coordinator
Mr.M.Karthi 	 Dr.V.Saravanan	

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

<b>Course Code:</b>	<b>20ITU05</b>	<b>Course Title</b>						<b>Batch:</b>	<b>2020-2021 &amp; onwards</b>
		<b>Data Structures and Algorithms</b>						<b>Semester:</b>	<b>II</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>Credits:</b>	<b>3</b>

### **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)**

<b>S.No</b>	<b>COURSE OUTCOME</b>	<b>BLOOMS LEVEL</b>
CO1	Define basic types for data structure, implementation and application	K1
CO2	Illustrate the complexity of given 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

**SYLLABUS**

20ITU05	Data Structures and Algorithms	Sem: 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 – Tree Traversal – Threaded Binary Trees - Counting binary trees. <b>Graphs:</b> Terminology and representations – Traversals- Connected Components.	9
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. Searching: <b>Files:</b> Files, Queries and Sequential organizations.	9
V	<b>Index Techniques:</b> Hashed Index-tree–indexing-Btrees. <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 BOOKS**

1. Ellis Horowitz, Sartaj Sahni and Sanguithevar, "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

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

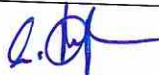


## MAPPING WITH PROGRAM OUTCOMES

PO CO	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 Co-coordinator
 Ms.G. Priyanka	 Mrs.K.Mythili	

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

Course Code:	20ITU06	Course Title						Batch:	2020-2021 & onwards
		Python Programming						Semester:	II
Hrs/Week:	3	L	3	T	-	P	-	Credits:	3

**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**

20ITU06	Python Programming	Sem: II
Unit No.	Topics	Hours
I	<b>PYTHON BASICS, LIBRARIES</b> <b>Overview of Python</b> -History of Python- Origins Features- Downloading and Installing Python- Running Python. <b>Basic Syntax</b> -Hello World-Interactive mode Programming -Script mode Programming -A simple Python Example-Python Libraries.	7
II	<b>DATA, EXPRESSIONS, STATEMENTS</b> Python Interpreter and Interactive mode - <b>Values And Types</b> :Int, Float, Boolean, String and List; Variables - Expressions -Statements, Tuple Assignment - Precedence of Operators - Comments. <b>Modules And Functions</b> : Function Definition and Use, Flow Of Execution, Parameters And Arguments.	7
III	<b>CONTROL FLOW, FUNCTIONS</b> <b>Conditionals</b> : Boolean Values and Operators - Conditional (if), Alternative (if-else), Chained Conditional (if-elif-else); <b>Iteration</b> : State, While, For, Break, Continue, Pass. <b>Fruitful Functions</b> : Return Values - Parameters - Local And Global Scope - Function Composition -recursion. <b>Strings</b> : String Slices - String Functions And Methods - Lists as Arrays.	7
IV	<b>LISTS, TUPLES</b> <b>Lists</b> : List Operations - List Slices - List Methods - List Loop - Mutability - Aliasing - Cloning Lists - List Parameters. <b>Tuples</b> : Tuple Assignment - Tuple As Return Value.	7
V	<b>DICTIONARIES, FILES</b> <b>Dictionaries</b> : Operations And Methods- Advanced List Processing - List Comprehension. <b>Files And Exception</b> : 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:**

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

**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. I Mark Lutz, "Programming Python ", O Reily, 4th Edition, 2010, ISBN 9780596158118
2. Tim Hall and J-P Stacey, "Python 3 for Absolute Beginners", 2009, ISBN:9781430216322
3. Magnus Lie Hetland, "Beginning Python: From Novice to Professional", 2nd Edition, 2009, ISBN:9781590599822.



## WEB RESOURCES

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


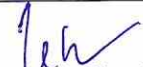

## MAPPING WITH PROGRAM OUTCOMES

PO CO	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

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

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
 Mr. D. Vijayakumar	 Dr. P. Senthilvadivu	

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

<b>Course Code:</b>	20ITMU06	<b>Course Title</b>						<b>Batch:</b>	<b>2020-2021 &amp; onwards</b>
		<b>Introduction to Programming using Python</b>						<b>Semester:</b>	<b>II</b>
<b>Hrs/Week:</b>	3	<b>L</b>	<b>3</b>	<b>T</b>	<b>-</b>	<b>P</b>	<b>-</b>	<b>Credits:</b>	3

#### **COURSE OBJECTIVE**

- Learn Python programming fundamentals
- Expose students to application development and prototyping using Python
- Learn to apply fundamental problem solving techniques

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

<b>S.No</b>	<b>COURSE OUTCOME</b>	<b>BLOOMS LEVEL</b>
CO1	Understand why Python is a useful scripting language for developers.	K1
CO2	Illustrate the structure and components of a Python program.	K2
CO3	Analyze and apply how to read and write files in Python.	K4
CO4	Build and package Python modules for reusability	K6

**SYLLABUS**

20ITMU06	Introduction to Programming using Python	Sem: II
Unit No.	Topics	Hours
I	Perform Operations using Data types and Operators: Evaluate an expression to identify the data type Python will assign to each variable - Data types include str, int, float, and bool - Convert between and work with data types – Type casting; constructing data structures; indexing and slicing operations - Determine the sequence of execution based on operator precedence - Assignment; Comparison; Logical; Arithmetic; Identity (is); Containment (in) - Select the appropriate operator to achieve the intended result - Assignment; Comparison; Logical; Arithmetic; Identity (is); Containment (in)	7
II	Control Flow with Decisions and Loops: Construct and analyze code segments that use branching statements.- if; elif; else; nested and compound conditionals - Construct and analyze code segments that perform iteration - while; for; break; continue; pass; nested loops and loops that include compound conditionals	7
III	Perform Input and Output Operations: Construct and analyze code segments that perform file input and output operations - open; close; read; write; append; check existence; delete; with statement – Construct and analyze code segments that perform console input and output operations - Read input from console; print formatted text; use of command line arguments	7
IV	Document code and Structure Code: Document code segments using comments and documentation strings - Use of indentation and white space; comments and documentation strings; pydoc - Construct and analyze code segments that include function definitions. - Call signatures; default values; return; def; pass.	7
V	Perform Troubleshooting and Error Handling: Analyze, detect, and fix code segments that have errors - Syntax errors; logic errors; runtime errors - Analyze and construct code segments that handle exceptions - Try; except; else; finally; raise. Perform Operations Using Modules and Tools: Perform basic operations using built-in modules - math; datetime; io; sys; os; os.path; random - Solve complex computing problems by using built-in modules: math; datetime; random.	8

*Note: Distribution of marks for Internal Examination -50 and External Examination -50*

**Teaching methods:**

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



**TEXT BOOKS**

1. Python programming- Certiport (Pearson vue publications)

**REFERENCE BOOKS**

1. Think Python: An Introduction to Software Design-Allen b downey
2. Fluent Python: Clear, Concise, and Effective Programming- Luciano Ramalho

**MAPPING WITH PROGRAM OUTCOMES**

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

S-Strong, M- Medium, L – Low

**ASSESSMENT PATTERN**

Follows Track -2 Industry Oriented (Microsoft & HP) pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
Ms. G. SivaBrindha	Dr. V. Saravanan	

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

Course Code:	20ITU08	Course Title					Batch:	2020-2021 & onwards	
		Data Structures using Python					Semester:	II	
Hrs/Week:	4	L	-	T	-	P	48	Credits:	2

#### COURSE OBJECTIVE

- Understand basic concepts about stacks, queues, lists, trees and graphs
- Understand concepts about searching and sorting techniques.
- Provide the necessary biological (Gene and protein) background which are required solve the problem that arise during the designing of algorithm.

#### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Recall the fundamentals concepts of data structures.	K1
CO2	Construct the program for array, stack, queue and linked list operation.	K3
CO3	Summarize the searching and sorting techniques	K2
CO4	Distinguish certain types of biological problem like sequence alignment, gene detection, structure prediction, data-mining literature	K4

**SYLLABUS**

20ITU08	PRACTICAL II : Data Structures using Python	Sem: II
Ex. No.	Program List	Hours
1	Program to create an array of 5 integers and display the array items. Access individual element through indexes.	4
2	Program to implement the queue operations.	4
3	Program to implement stack operations Using a Python List.	4
4	Program to perform Binary Search.	4
5	Program to implement Linear Search.	4
6	Program to perform selection sort.	4
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.	6
9	Gene Sequence mining using Python.	6
10	Bio computing in Python.	6

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

**Teaching methods:**

PowerPoint Projection through LCD, Demonstration



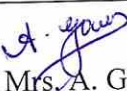
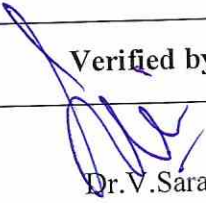

## MAPPING WITH PROGRAM OUTCOMES

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	M	L
CO2	M	L	S	S
CO3	S	S	M	S
CO4	S	S	L	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 Co-coordinator
 Mrs. A. Gowri	 Dr. V. Saravanan	

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

<b>Course Code:</b>	<b>20ITU09</b>	<b>Programming with JAVA</b>					<b>Batch:</b>	<b>2020-2021 &amp; Onwards</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>Semester:</b>	<b>III</b>
								<b>Credits:</b>	<b>5</b>

### COURSE OBJECTIVE

- 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)

<b>S.No</b>	<b>COURSE OUTCOME</b>	<b>BLOOMS LEVEL</b>
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**

20ITU09	Programming with JAVA	Sem: III
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	10
II	<b>Object Oriented concepts:</b> Classes, Objects and Methods: Methods & variables - Constructor-Overloading - Static members - Final Classes – Abstract method- Arrays, Strings and Vectors. – <b>Interfaces:</b> Multiple Inheritance –Extending interfaces- implementing interfaces. Packages: Putting Classes together-creating, accessing & using packages.	12
III	<b>Multithreaded Programming:</b> creating Threads -Extending Threads -Thread life cycle- Thread Exception- Priority-Implementing Runnable interface. <b>Managing Errors and Exceptions:</b> Introduction- Exception handling – Exceptions- Multiple Catch statement-using finally statement– Applet Programming – Graphics Programming.	14
IV	<b>Files:</b> 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.	10
V	<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& Menus - Event handling by AWT components. Introduction: Java Bean - Socket Programming – Servlets - Java Server Pages, JDBC.	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 – A Primer", TMH, 3rd Edition.

**REFERENCE BOOKS**

1. Patrick Naughton & Herbert Schildt, "The Complete Reference Java 2", TMH, 3rd Edition.
2. John R. Hubbard, "Programming with Java", TMH, 2nd Edition.
3. Herbert Schildt, "The Complete Reference Java", Paperback, 7th Edition



## WEB RESOURCES

Web Link:

1. <https://www.w3schools.com/java/>
2. <https://www.javatpoint.com/java-tutorial>




## MAPPING WITH PROGRAM OUTCOMES

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	M	-
CO2	S	M	S	-
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 Co-coordinator
 Dr. P.Lalitha	 Dr. V. Saravanan	

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

Course Code:	20ITU10	Course Title						Batch:	2020-2021 & onwards
		Network Security and Cryptography						Semester:	III
Hrs/Week:	5	L	5	T	-	P	-	Credits:	5

### COURSE OBJECTIVE

- Understand the fundamental principles of access control models and techniques, authentication and secure system design.
- Have a strong understanding of different cryptographic protocols and techniques and be able to use them.
- Apply methods for authentication, access control, intrusion detection and prevention.
- Identify and mitigate software security vulnerabilities in existing systems.

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Identify cryptography algorithms, network security concepts and system security.	K1
CO2	Apply security principles to system design, implement encryption and decryption algorithms.	K2
CO3	Identify and investigate network security threat and firewalls.	K3
CO4	Analyze and design network security protocols and standards.	K4

**SYLLABUS**

20ITU10	Network Security and Cryptography	Sem: III
Unit No.	Topics	Hours
I	<b>Introduction:</b> Introduction to Cryptography, Security Threats, Vulnerability, Active and Passive attacks, Security services and mechanism, Conventional Encryption Model. Classical encryption techniques - substitution ciphers and transposition ciphers – cryptanalysis – steganography - stream and block ciphers - Modern Block Ciphers: Block ciphers principals - Shannon’s theory of confusion and diffusion - fiestal structure.	12
II	<b>Cryptography and Block Ciphers:</b> Data encryption standard (DES) - strength of DES - differential and linear crypt analysis of DES - block cipher modes of operations - triple DES – AES. Traffic confidentiality - key distribution - random number generation.	10
III	<b>Public key cryptography and Authentication requirements:</b> Principles of public key crypto systems - RSA algorithm - security of RSA - key management – Diffie-Hellman key exchange algorithm - introductory idea of Elliptic curve cryptography – Elgamel encryption - Message Authentication and Hash Function: Authentication requirements - authentication functions - message authentication code - hash functions - security of hash functions and MACS.	12
IV	<b>Integrity checks and Authentication algorithms:</b> MD5 message digest algorithm - Secure hash algorithm (SHA) Digital Signatures: Digital Signatures - authentication protocols - digital signature standards (DSS) - proof of digital signature algorithm - Authentication Applications: Kerberos and X.509 - directory authentication service - electronic mail security-pretty good privacy (PGP) - S/MIME.	13
V	<b>IP Security and Key Management:</b> IP Security: Architecture - Authentication header - Encapsulating security payloads - combining security associations - key management. Web and System Security: Web Security: Secure socket layer and transport layer security - secure electronic transaction (SET) - System Security: Intruders - Viruses and related threads - firewall design principals – trusted systems.	13

*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. William Stallings, "Cryptography and Network security Principles and Practices", Pearson/PH – Seventh Edition, 2017

## REFERENCE BOOKS

1. Modern Cryptography: Theory and Practice, by Wenbo Mao, Prentice Hall PTR, 1<sup>st</sup> Edition.
2. Network Security Essentials: Applications and Standards, by William Stallings, Prentice Hall
3. Cryptography and Network Security, by Behrouz A. Frouzan, Tata McGraw Hill

## WEB RESOURCES

Web Link:

1. [http://uru.ac.in/uruonlinelibrary/Cyber\\_Security/Cryptography\\_and\\_Network\\_Security.pdf](http://uru.ac.in/uruonlinelibrary/Cyber_Security/Cryptography_and_Network_Security.pdf)
2. <https://www.tutorialspoint.com/cryptography/index.htm>



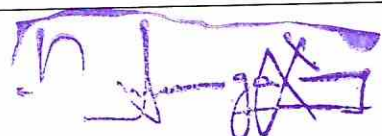
## MAPPING WITH PROGRAM OUTCOMES

PO CO	PO1	PO2	PO3	PO4
CO1	M	S	M	-
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 Co-coordinator
 Ms. G. Sivabrintha	 Dr. V. Saravanan	

Cell  
Science,  
028.

<b>Course Code:</b>	20ITU11	<b>Course Title</b>						<b>Batch:</b>	2020 -2021 & onwards
		Software Engineering						<b>Semester:</b>	III
<b>Hrs/Week:</b>	4	L	4	T	-	P	-	<b>Credits:</b>	4

### COURSE OBJECTIVE

- Be successful professionals in the field with solid fundamental knowledge of software engineering
- Utilize and exhibit strong communication and interpersonal skills, as well as professional and ethical principles when functioning as members and leaders of multi-disciplinary teams
- Apply their foundations in software engineering to adapt to readily changing environments using the appropriate theory, principles and processes
- Construct skills that will enable them to construct software of high quality – software that is reliable, and that is reasonably easy to understand, modify and maintain.

### COURSE OUTCOMES (CO)

S.No.	COURSE OUTCOME	BLOOMS LEVEL
CO1	Identify, formulates and solves complex engineering problems by applying principles of engineering, science, and mathematics.	K1
CO2	Evaluate the engineering design principles to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	K2
CO3	Analyze frameworks, models to test and maintain various software engineering concepts.	K3
CO4	Apply and understand the risks in ethical and professional responsibilities in engineering situations and consider the impact of engineering solutions in global, economic, environmental, and societal contexts	K4



## SYLLABUS

20ITU11	Software Engineering	Sem:III
Unit No.	Topics	Hours
I	<b>Introduction And Agile Development</b> Software Engineering-Software Process- Generic process model-Prescriptive process model-specialized, unified process-Agile Development-Agile Process- Extreme Programming- Other agile Process Models-Software engineering Knowledge-core Principles-Principles that guide each framework Activity.	10
II	<b>Requirements Modeling</b> Requirements Analysis-SoftwareScenario Based Modeling, UML Models-Data Modeling Concepts, Class Based Modeling, Requirements Modeling Strategies, Flow Oriented Modeling, Creating a Behavioral Model, Pattern for Requirement Modeling.	9
III	<b>Software Design Concepts</b> Design Process, Design Concepts, Design Model , Architectural Design: Software Architecture, Architectural Genres, Styles, Design, Component Level Design: Designing Class Based Components, Designing Traditional Components, Component Based Development, User Interface Design: The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, WebApp Interface Design; Pattern Based Design: Design Patterns, Pattern Based Software Design, Architectural Patterns, Component Level Design Patterns, User Interface Design Patterns, WebApp Design Patterns.	10
IV	<b>Quality Concepts And Testing</b> Software Quality- Quality Concepts- Software Quality Assurance-Testing: Strategic Approach to software Testing- Strategic Issues- Software Testing Strategies- Testing Conventional Applications- Testing Object-Oriented Applications	10
V	<b>Risk Management And Maintenance</b> Software Risks, Risk Identification, Risk Projection, Risk Refinement, Risk Mitigation, Monitoring, and Management, Maintenance: Software Maintenance-Software Supportability- Reengineering- Business Process Reengineering- Software Reengineering- Reverse Engineering- Restructuring- Forward Engineering- Economics of Reengineering.	9

*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. Roger S.Pressman, " Software Engineering- A Practioner's Approach", Seventh Edition, McGraw-Hill International Edition, 2010.
2. Roger S. Pressman, Bruce R. Maxim " Software Engineering\_ A Practitioner's Approach" McGraw-Hill Education , 2014.



## REFERENCE BOOKS

1. Ian Sommerville, "Software Engineering", 8<sup>th</sup> Edition, Pearson Education Asia, 2011.
2. Stephan Schach, Software Engineering, Tata McGraw Hill 2007.
3. Pfleeger and Lawrence Software Engineering : Theory and Practice, Pearson Education, Second Edition.

## WEB RESOURCES

Web Link:

1. <https://lecturenotes.in/notes/15479-note-for-software-engineering-se-by-sourav-mishra?reading=true>
2. [https://mrcet.com/downloads/digital\\_notes/CSE/III%20Year/SOFTWARE%20ENGINEERING%20NOTES.pdf](https://mrcet.com/downloads/digital_notes/CSE/III%20Year/SOFTWARE%20ENGINEERING%20NOTES.pdf)

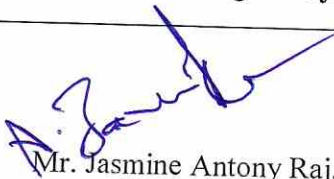

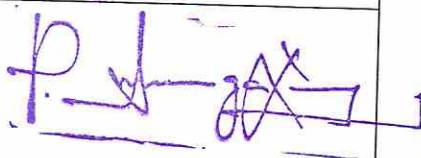
## MAPPING WITH PROGRAM OUTCOMES

PO CO	PO1	PO2	PO3	PO4
CO1	S	M	M	M
CO2	M	M	S	S
CO3	M	S	S	S
CO4	M	-	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 Co-coordinator
 Mr. Jasmine Antony Raj. A	 Dr. V. Saravanan	

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

Course Code:	20ITMU11	Course Title						Batch:	2020 -2021 & onwards
		Big Data and Data Science – R Programming						Semester:	III
Hrs/Week:	4	L	4	T	-	P	-	Credits:	4

#### COURSE OBJECTIVE

- To understand basic concepts of Big Data and Hadoop.
- To be familiar with the field of analytics.
- To make learner able to construct what goes behind the processing of huge volumes of data.
- To prepare an individual for a job in Big Data Programming or in the analytics space.

#### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	To identify the fundamentals of Big Data and working with hadoop concepts.	K1
CO2	Ability to scripting with Hive and Hbase and programming with MapReduce.	K2
CO3	Ability to synchronize distributed resources using zookeeper and data loading concepts.	K3
CO4	To understand business analytics using R programming.	K4



**SYLLABUS**

20ITMU11	Big Data and Data Science – R Programming	Sem:III
Unit No.	Topics	Hours
I	<b>Big Data – Programming and Development</b> <b>Introduction to Big Data:</b> Introduction-Applicability of Big Data-Big Data Technologies-Introduction to Hadoop-Distributed Computing Basics-Evolution of Distributed systems. Working with Hadoop and its components and concepts-Analysis of Hadoop-HDFS and Hadoop commands-Introduction to MapReduce-How MapReduce works-Pig-Hive.	9
II	<b>Scripting with Hive &amp; Hbase:</b> Hive Data types and file formats-Hive query language-Hbase architecture Details-Working with Hbase. Programming using Mapreduce for Big Data-1: Programming concepts in MapReduce-HDFS programming in Java-Executing a MapReduce program-Debugging & Diagnosing MapReduce program. Programming using MapReduce for Big Data-2: Job Chaining & Merging-Input & Output patterns-NextGen MapReduce using YARN & REST.	9
III	<b>Distributed Resource synchronization using Zookeeper:</b> Zookeeper in detail. Data loading using Sqoop: Sqoop in detail-Introduction to ETL and CDC-TelenD: Introduction-components-ETL perspective-Installation-Basic operations. Handling large log files using Flume:Flume in detail- Kafka: introduction-Architecture and workflow- Installation-Basic operations. Handling workflow using Oozie-Workflow scheduling using Oozie. Understanding Popular Big Data platforms: Cludera- Hortonworks-Greenplum- Vertica.	10
IV	<b>Analytics with R</b> <b>Introduction to Business Analytics:</b> Introduction to Business Analytics & its features-Types of Business Analytics- Business Analytics Case Studies-Business Decisions-Business Intelligence-Data Science and its importance. Introduction to R: Introduction- Understanding R-Using R to illustrate the basic concepts-installing R and RStudio-Integrated Development environments for R-Using R console-Scripting in R-R Workplace and Packages-Distributed R.R Programming: Introduction-Operators in R-Basic and Advance data types-Loops and Conditional statement in R-Commands to run an R script and a Batch script- Functions in R-String manipulation in R-Dplyr package-an.verview-Installing Dplyr-Functions of the Dplyr package.	10
V	<b>R Data structure:</b> Types of Data structure in R-Vectors-Scalars-Matrices-Arrays-Data Frames-Factors-Lists-Acceptable formats to Import and Export data in R- Data Visualization: Graphics in R-Types of Graphics-Basic elements of graph- Methods to save graphics as files-Procedure to export graphics in RStudio. R Connection with database: Introduction to RDMS-Introduction to MySql-R packages to connect to database-Data analysis of data from database. Debugging in R: introduction-important function to debug.Statistics in R:Introduction –Types of Data-Qualitative vs Quantitative analysis-Hypotheses testing in R-Need of Hypotheses testing-Test of mean-Test of Variance-Chi- Square test-Non-parametric test-Linear regression-Basics of classification-Basics of Clustering	10

*Note: Distribution of marks for Internal Examination -50 and External Examination -50*



**Teaching methods:**

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

**TEXT BOOKS**

1. *Big Data Analytics with R*, Simon Walkowiak, Packt Publishing
2. *Big Data & Hadoop Learn by Example*, By MayankBhushan · 2018, BPB Publications

**REFERENCE BOOKS**

1. *R for Data Science Import, Tidy, Transform, Visualize, and Model Data*, By Hadley Wickham, Garrett Golemund, O'Reilly Media , 2016
2. *Data Analytics with Hadoop An Introduction for Data Scientists*, By Benjamin Bengfort, Jenny Kim, O'Reilly Media , 2016
3. *Big Data Analytics with R and Hadoop*, By VigneshPrajapati, Packt Publishing , 2013

**WEB RESOURCES**

Web Link:




1. <http://csis.pace.edu/ctappert/cs816-19fall/books/2015DataScience&BigDataAnalytics.pdf>
2. <https://www.cs.upc.edu/~robert/teaching/estadistica/rprogramming.pdf>

**MAPPING WITH PROGRAM OUTCOMES**

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

S-Strong, M- Medium, L-Low

**ASSESSMENT PATTERN**

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
 Ms. Sivabrintha G	 Dr. V. Saravanan	

Cell  
B. Science,  
028.

<b>Course Code:</b>	20ITU13	<b>Practical -III:Programming using JAVA</b>						<b>Batch:</b>	2020-2021 & Onwards
								<b>Semester:</b>	III
<b>Hrs/Week:</b>	6	L	-	T	-	P	6	<b>Credits</b>	3

### COURSE OBJECTIVE

- Understand and Develop Standalone Java Programs.
- Design and Develop GUI Applications using Abstract Window Tool Kit.
- Develop GUI Application using Applet.
- Develop Applications using Swing.

### COURSE OUTCOMES (CO)

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

**SYLLABUS**

20ITU13	Practical-III: Programming using JAVA	Sem:III
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 demonstrate Graphics and Applet class.	6
7	Write a java program to implement the concept of Applet & AWT Events.	6
8	Develop a Java Program to implement Swing concepts.	6
9	Develop a GUI program using Swing components.	6
10	Write a java program which open an existing file and append the text to that file.	6
11	Develop a program to Analyze the Gene sequence.	6
12	Write a program for calculating Biocomputing.	6

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

**Teaching methods:** PowerPoint Projection through LCD, Demonstration.

**MAPPING WITH PROGRAM OUTCOMES**




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

Strong, M- Medium, L - Low



## ASSESSMENTPATTERN

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

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
 Dr. P.Lalitha	 Dr.V.Saravanan	

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

Course Code:	20ITU14	Course Title						Batch:	2020-2021 & onwards
		Practical -IV: Networking Security Lab						Semester:	III
Hrs/Week:	3	L	-	T	-	P	3	Credits:	2

### COURSE OBJECTIVE

- Inculcate knowledge in Networking and Security concepts.
- Understand various cryptographic algorithms.
- Understand the basic categories of threats to computers and networks
- Describe public-key cryptosystem

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Create basic cryptographic algorithms, message and web authentication and security issues.	K1
CO2	Analyze information system requirements for both of them such as client and server.	K2
CO3	Evaluate the current legal issues towards security	K3
CO4	Develop various Encryption and Decryption algorithms for effective communication.	K4

**SYLLABUS**

20ITU14	Practical -IV: Networking Security Lab	Sem: III
Ex. No.	Program List	Hours
1	Write a java program that contains a string (char pointer) with a value 'Hello world'. The program should XOR each character in this string with 0 and displays the result.	3
2	Write a java program that contains a string (char pointer) with a value 'Hello world'. The program should AND or and XOR each character in this string with 127 and display the result.	3
3	Write a Java program to perform encryption and decryption using the following algorithm Ceaser cipher	3
4	Write a Java program to perform encryption and decryption using the following algorithm Substitution cipher	3
5	Write a JAVA program to implement the DES algorithm logic	4
6	Write a JAVA program to implement the Blowfish algorithm logic.	4
7	Write a JAVA program to implement the Rijndael algorithm logic.	4
8	Write a Java program to implement RSA algorithm.	4
9	Write the RC4 logic in Java Using Java cryptography; encrypt the text "Hello world" using Blowfish. Create your own key using Java key tool.	4
10	Calculate the message digest of a text using the SHA-1 algorithm in JAVA.	4

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

**Teaching methods:**

PowerPoint Projection through LCD, Demonstration

**MAPPING WITH PROGRAM OUTCOMES**




PO CO	PO1	PO2	PO3	PO4
CO1	M	M	S	S
CO2	M	S	S	S
CO3	-	S	M	M
CO4	S	M	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 Co-coordinator
 Mrs. Antony Cynthia	 Dr. V. Saravanan	

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

Course Code:	20ITU15	Course Title						Batch:	2020-2021 & onwards
		Relational Database Management System						Semester:	IV
Hrs/Week:	6	L	6	T	-	P	-	Credits:	6

### COURSE OBJECTIVE

- To describe the fundamental elements of Relational database management system.
- To understand database management system, data availability, data integrity, data security, and data independence.
- To analyze database requirements and determine the entities involved in the system and their relationship to one another.
- To inculcate knowledge on RDBMS concepts.

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Define the fundamental elements of Relational Database Management System	K1
CO2	Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra	K2
CO3	Applying various Normalization Techniques and Develops PL/SQL programming using Cursor Management, Error Handling, Procedures, Functions, Triggers and Packages	K3
CO4	Illustrate the knowledge of the processes of database development and administration using SQL and PL/SQL	K4

**SYLLABUS**

20ITU15	Relational Database Management System	Sem:IV
Unit No.	Topics	Hours
I	<p><b>Database Concepts : A Relational approach :</b> Database–Relationships– Database Management System (DBMS)– The Relational Database Model – Integrity Rules –Theoretical Relational Languages.</p> <p><b>Database Design: Data Modeling and Normalization :</b> Data Modeling– Dependency – Database Design – Normal forms – Dependency Diagrams – Denormalization.</p>	14
II	<p><b>Oracle9i: An Overview :</b> Personal Databases–Client / Server Databases – Oracle9i : An Introduction – The SQL *Plus Environment – Structured Query Language (SQL)– Logging into SQL *Plus–SQL *Plus Commands.</p> <p><b>Oracle Tables: Data Definition Language (DDL) :</b> Naming Rules and conventions– Data Types – Constraints – Creating an Oracle Table– Displaying Table Information– Altering an Existing Table– Dropping, Renaming, Truncating a Table– Oracle’s Various Table Types – Spooling –Error Codes.</p>	14
III	<p><b>Working with Tables: Data Management and Retrieval:</b> Data Manipulation Language (DML)– Adding a new Row / Record – Customized Prompts –Updating and Deleting Existing Rows / Records– Retrieving Data from a Table – Arithmetic Operations– Restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables– DEFINE command – CASE structure.</p> <p><b>Functions and Grouping:</b> Built-in functions–Grouping Data. <b>Multiple Tables: Joins and Set operators:</b> Join–Set operators.</p>	15
IV	<p><b>PL/SQL: A Programming Language:</b> Fundamentals of PL/SQL – PL/SQL Block Structure–Comments–Data Types–Variable Declaration– Assignment Operation – Bind Variables– Substitution Variables – Printing – Arithmetic Operators.</p> <p><b>Control Structures and Embedded SQL:</b> Control Structures – Nested Blocks –SQL in PL/SQL –Data Manipulation–Transaction Control statements.</p> <p><b>PL/SQL Cursors and Exceptions:</b> Cursors – Implicit &amp; Explicit Cursors and Attributes – Cursor FOR loops – SELECT...FOR UPDATE cursor– WHERE CURRENT OF Clause–Cursor with Parameters–Cursor Variables– Exceptions–Types of Exceptions.</p>	14
V	<p><b>PL/SQL Composite Data Types:</b> Records–Tables–VArrays. <b>PL/SQL Named Blocks:</b> Procedures – Functions – Packages –Triggers –Data Dictionary Views.</p>	15

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

**Teaching methods:**

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



## TEXT BOOKS

1. NileshShah. "DatabaseSystemsusingOracle",PHILearningPrivateLimited, 2ndedition,2014.

## REFERENCE BOOKS

1. RaghuRamakrishnanandJohannesGehrke, "DatabaseManagementSystems", McGraw-HillEducation, 2003.
2. Singh, "DatabaseSystems: Concepts,Design&applications", PearsonEducation.
3. AbrahamSilberschatz, HenryF.Korth, S.Sudarshan, "DatabaseSystemConcepts", McGraw-Hill, Fifthedition, 2005.

## WEB RESOURCES

WebLink:

1. <https://www.geeksforgeeks.org/dbms/>
2. <https://www.javapoint.com/dbms-tutorial>

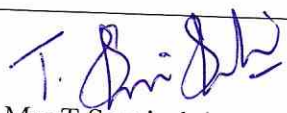


## MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

FollowscommonpatternofInternalandExternalAssessment,suggestedinthe Regulations.

CourseDesignedby	Verifiedby HOD	Approved by CDC Co-coordinator
 Mrs. T. Seeniselvi	 Dr. V. Saravanan	

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

Course Code:	20ITMU15	Course Title						Batch:	2020-2021 & onwards
		Database Administration Fundamentals						Semester:	IV
Hrs/Week:	6	L	6	T	-	P	-	Credits:	6

### COURSE OBJECTIVE

- To prove introductory knowledge of skills with database including relational database.
- To be familiar with the concepts of and have hands on experience with the technologies.
- Undertake relevant training courses by working with tutorial and samples available on MSDN.
- To recommend hands on experience with the technologies.

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Understand core database concepts and relational database concepts	K1
CO2	security requirements for databases and the data stored in them and database objects, such as tables and views	K3
CO3	Apply graphical tools to create views, scripting using T-SQL scripts, SQL to create database queries and stored procedures	K2
CO4	Implement Normalization concepts, choosing appropriate keys and security concepts.	K3



## SYLLABUS

20ITMU15	Database Administration Fundamentals	IV
Unit No.	Topics	Hours
I	Understanding Core Database Concepts: Understand how data is stored in tables - understanding what a table is and how it relates to the data that will be stored in the database; Columns/fields, rows/records - Understand relational database concepts - Understanding what a relational database is, the need for relational database management systems. (RDBMS), and how relations are established - Understand data manipulation language (DML)- Understanding what DML is and its role in databases - Understand data definition language (DDL). Understanding how T-SQL can be used to create database objects such as tables and views.	14
II	Creating Database Objects: Choose Data Types: understanding what data types are, why they are important, and how they affect requirements - Understand Tables and How to Create Them - purpose of tables; Creating tables in a database by using proper ANSI SQL syntax - Create Views. Understanding - when to use views and how to create a view by using T-SQL or a graphical designer - Create Stored Procedures and Functions. Selecting, inserting, updating, or deleting data.	14
III	Manipulating Data : Select Data - utilizing SELECT queries to extract data from one table; extracting data by using joins; Combining result sets by using UNION and INTERSECT - Insert Data. Understanding how data is inserted into a database; how to use INSERT statements - Update Data. Understanding how data is updated in a database and how to write the update data to the database by using the appropriate UPDATE statements; update by using a table- Delete Data. Deleting data from single or multiple tables; ensuring data and referential integrity - by using transactions.	15
IV	Data Storage : Understand Normalization - understanding the reasons for normalization, the five most common levels of normalization, how to normalize a database to third normal form- Understand primary, foreign, and composite keys. Understanding the reason for keys in a database, choosing appropriate primary keys, selecting appropriate data type for keys, selecting appropriate fields for composite keys, understanding the relationship between foreign and primary keys - Understand Indexes. Understanding clustered and non-clustered indexes and their purpose in a database.	15
V	Administering a Database: Understand Database Security Concepts. Understanding the need to secure a database, what objects can be secured, what objects should be secured, user accounts, and roles - Understand Database Backups and Restore. Understanding various backup types, such as full and incremental, importance of backups, how to restore a database.	14

*Note: Distribution of marks for Internal Examination - 50 and for External Examination - 50*

### Teaching methods:

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



## TEXT BOOKS

1. NileshShah. "DatabaseSystemsusingOracle",PHILearningPrivateLimited, 2ndedition,2014.

## REFERENCE BOOKS

1. RaghuRamakrishnanandJohannesGehrke, "DatabaseManagementSystems", McGraw-HillEducation, 2003.
2. Singh, "DatabaseSystems: Concepts,Design&applications", PearsonEducation.
3. AbrahamSilberschatz, HenryF.Korth, S.Sudarshan, "DatabaseSystemConcepts", McGraw-Hill, Fifthedition, 2005.

## WEB RESOURCES

WebLink:

1. <https://www.geeksforgeeks.org/dbms/>
2. <https://www.javapoint.com/dbms-tutorial>



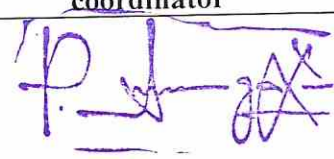
## MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

## ASSESSMENT PATTERN

FollowscommonpatternofInternalandExternalAssessment,suggestedinthe Regulations.

CourseDesignedby	Verifiedby HOD	Approved by CDCCo- coordinator
 Ms.G. Sivabrintha	 Dr.V.Saravanan	

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

<b>Course Code:</b>	<b>20ITU16</b>	<b>Course Title</b>						<b>Batch:</b>	<b>2020-2021 &amp; onwards</b>
		<b>Operating System</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 OBJECTIVE

- Understand the purpose, structure and functions of Operating System.
- Study the process management, scheduling and implementation of Memory management policies and virtual memory
- Understand various issues in Inter Process Communication (IPC) and the role of OS in IPC.
- Understand the case study of Linux and Windows by performing File Management and Disk Management.

### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Describe the important computer system resources and the role of operating system in their management policies and algorithms.	K1
CO2	Discuss the process management policies and scheduling of processes by CPU	K2
CO3	Illustrate the storage management with respect to different storage management technologies	K3
CO4	Analyze the case study and perform file management techniques.	K4

**SYLLABUS**

20ITU16	Operating System	Sem: IV
Unit No.	Topics	Hours
I	<b>Introduction to operating system:</b> Introduction - Mainframe systems - Desktop Systems - Multiprocessor Systems - Distributed Systems - Clustered Systems - Real Time Systems - Handheld Systems - System Components - Operating System Services - System Programs -Process Concept - Process Scheduling - Operations on Processes - Cooperating Processes -Inter-process Communication.	14
II	<b>Scheduling in operating system:</b> Scheduling- Threads - Overview - Threading issues - CPU Scheduling - Basic Concepts - Scheduling Criteria - Scheduling Algorithms - Multiple-Processor Scheduling - Real Time Scheduling - The Critical-Section Problem - Semaphores - Critical regions - Monitors.	15
III	<b>Memory Allocation:</b> System Model - Deadlock Characterization - Methods for handling Deadlocks - Deadlock Prevention - Deadlock detection - Recovery from Deadlocks - Storage Management - Swapping - Contiguous Memory allocation - Paging - Segmentation - Segmentation with Paging.	14
IV	<b>Memory Management:</b> Virtual Memory - Demand Paging - Process creation - Page Replacement - Allocation of frames - Thrashing - File Concept - Access Methods - Directory Structure - File Sharing – Protection.	14
V	<b>File Structure:</b> File System Structure - File System Implementation - Directory Implementation - Allocation Methods - Free-space Management. Kernel I/O Subsystems - Disk Structure - Disk Scheduling- Disk Management - Swap-Space Management. Case Study: The Linux System, Windows.	15

*Note:DistributionofmarksforInternalExamination-30andforExternalExamination-70*

**Teaching methods:**

Lecturing,PowerPoint ProjectionthroughLCD,Assignment,DiscussionandActivity.

**TEXT BOOKS**

1. Harvey M. Deitel, "Operating System", Pearson Education Pvt. Ltd, Third Edition, 2019.

**REFERENCE BOOKS**

1. William Stallings, "Operating System", Prentice Hall of India, 4th Edition.
2. Dhamdhere, "Systems Programming and Operating System", TM 2<sup>nd</sup> Edition Revised.
3. Godbole, "Operating System 3E", McGraw-Hill Education (India) Pvt Limited.



## WEB RESOURCES

Web Link:

1. <https://civildatas.com/download/operating-systems-by-deitel>
2. [https://kupdf.net/download/operating-systems-deitel-3rd-edition-1-pdf\\_58aa0f676454a7ee1bb1e8f5\\_pdf](https://kupdf.net/download/operating-systems-deitel-3rd-edition-1-pdf_58aa0f676454a7ee1bb1e8f5_pdf)



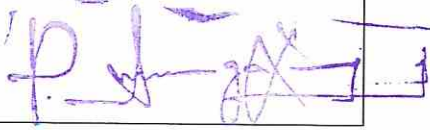
## MAPPING WITH PROGRAM OUTCOMES

PO CO	PO1	PO2	PO3	PO4
CO1	S	M	M	M
CO2	M	M	M	S
CO3	M	M	S	M
CO4	S	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 Co-coordinator
 Mrs. A. Gowri	 Dr. V. Saravanan	

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

Course Code:	20ITU17	Course Title						Batch:	2020-2021 & onwards
		Practical - V: RDBMS Applications						Semester:	IV
Hrs/Week:	6	L	-	T	-	P	6	Credits:	3

#### COURSE OBJECTIVE

- To Understand and gain knowledge in database concepts.
- To Design and develop applications using frontend tools and back-end DBMS.
- To effectively organize, maintain applications, and information in database concepts
- To retrieve information efficiently in database concepts

#### COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Interpreting and underlying concepts of database	K2
CO2	Defining the Database model and determining the DDL and DCL commands	K1
CO3	Builds PL/SQL functions	K3
CO4	Develop and validate by building applications	K3

**SYLLABUS**

20ITU17	Practical - V: RDBMS Applications	Sem: IV
Ex. No.	Program List	Hours
1	Create a table for Student details with Registration Number as Primary Key and following fields: Name, Course, Gender, Age, Year of Joining and Percentage. Insert at least 10 rows and perform various queries using any one Comparison, Logical, Set, Sorting and Grouping Operators.	6
2	Create a table for Student database and perform DDL and DML Commands and generate a report.	6
3	Develop a database for Employee applications by applying Built-in Functions.	6
4	Write a PL/SQL block to find out if a year is a leap year. A leap year is divisible by 4 but not by 100, or it is divisible by 400. (Hint: The function MOD (n, d) divides n by d and return the integer remainder from the operations).	6
5	Write a PL/SQL code to find Factorial of a given number using Recursive Function.	6
6	Write a PL/SQL program in Cursor using Loops.	6
7	Create a database trigger to implement in the main and transaction tables which is related to the inventory system for checking the data validity with the tables having the needed fields	6
8	Write a PL/SQL program to create a table for a bank account and create an exception for managing the account where the account is said to be zero.	6
9	Develop a simple project for Student Database Management System using Visual Basic as front end and ORACLE as back end.	12
10	Demonstrate simple project for Airline Reservation Management System using Visual Basic as front end and ORACLE as back end and display a report.	12

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

**Teaching methods:**

PowerPoint Projection through LCD, Demonstration



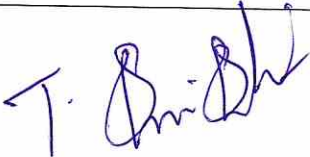

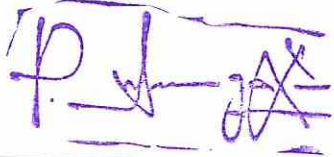
## MAPPING WITH PROGRAM OUTCOMES

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	M	M
CO2	S	M	M	S
CO3	S	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 CDCCo-coordinator
 Mrs. T. Seeni Selvi	 Dr. V. Saravanan	

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

<b>Course Code:</b>	<b>20ITU19</b>	<b>Course Title</b>						<b>Batch:</b>	<b>2020-2021 &amp; onwards</b>
		<b>Practical - VI: Mobile Application Development</b>						<b>Semester:</b>	<b>IV</b>
<b>Hrs/Week:</b>	<b>5</b>	<b>L</b>		<b>T</b>	<b>-</b>	<b>P</b>	<b>5</b>	<b>Credits:</b>	<b>3</b>

#### **COURSE OBJECTIVE**

- To understand the components and services related to Android Studio.
- To design and implement simple applications using android studio
- To facilitate students to understand android SDK
- To inculcate working knowledge of Android Studio development tool

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

<b>S.No</b>	<b>COURSE OUTCOME</b>	<b>BLOOMS LEVEL</b>
CO1	Understand the components of Android studio.	K1
CO2	Apply the concepts of HTML, XML and CSS	K2
CO3	Develop simple applications	K3
CO4	Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces.	K4

**SYLLABUS**

20ITU19	Practical - VI:Mobile Application Development	Sem: IV
Ex. No.	Program List	Hours
1	Identify the various windows in Android Studio and Illustrate the steps to build a simple android Application	6
2	Help the user move from one screen to another and in between the navigation list the action performed. Demonstrate the Activity Life Cycle	6
3	If Jack wants to add the amount he spent on purchasing items and detect the amount he replaced in the shop. Together with that he will have to perform bulk operations and single operations, what should he do. Design an android program to perform the operations of a calculator.	6
4	Sandiya accesses any one of the mobile application, in this scenario implement the action performed. Implementation of events(Android program to change the image displayed on the screen)	6
5	A baby keeps crying and his mother tries very hard to calm the child. This has no effect on the child. But when the mobile is given and a video is played the child is very happy. Design a program for this scenario. Develop a simple android app for displaying a video view.	6
6	If you are allowed to choose from a list of option what would you do? Illustrate Listview Activity.	6
7	How do we remember special events? Create a simple android app to display calendar event using Intent.	6
8	Design Tab Navigation App.	6
9	Design a simple Quiz App.	6
10	Develop a simple Music Player App.	6

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

**Teaching methods:**

PowerPoint Projection through LCD, Demonstration






## MAPPING WITH PROGRAM OUTCOMES

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	M	-
CO2	S	M	-	S
CO3	S	S	M	S
CO4	S	M	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 Co-coordinator
 Mrs. MarraynalSEastaff	 Dr. V. Saravanan	

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