HICAS

LEARNING OUTCOMES–BASED CURRICULUM FRAMEWORK (LOCF)

in the

UNDERGRADUATE PROGRAMME

Bachelor of Computer Applications - BCA

FOR THE STUDENTS ADMITTED FROM THE

ACADEMIC YEAR 2021 - 2022 AND ONWARDS

HINDUSTHAN EDUCATIONAL AND CHARITABLE TRUST

HICAS

HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)
(Affiliated to Bharathiar University and Accredited by NAAC) COIMBATORE-641028
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PREAMBLE

Learning Outcome Based Curriculum Framework for Undergraduate education in Bachelor of Computer Applications is a 3 – Year Undergraduate Programme spread over six semesters. The course is designed to achieve high degree of technical skills in Problem solving and application development. The course develops requisite professional skills and problem solving abilities for pursuing a successful career in software industry and forms the required basics for pursuing higher studies in Computer Applications.

VISION

To provide world class education to the students to face global challenges and to inculcate the latest trends in technological advancement. To cater the needs of the environment and ethical values in the mind of students to become good citizens and entrepreneurs.

MISSION

The Mission of the College is to pursue a philosophy of perpetual acquisition of knowledge.
The important policy is to provide value-based education and to bring out the hidden potentials in students that equips them to approach life with optimism.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

Under Graduates of Computer Applications program will

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

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

PEO3: Understand the importance of renewable energy and its applications

PEO4: To provide the students, the ability to adapt new technology in the key domain of Computer Applications.

PEO5: To improve student's professional and ethical values, effective communication and team work skills to work in multidisciplinary teams.

PROGRAMME OUTCOME (PO)

PO1: To apply computing knowledge in mathematics for real time applications.

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

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

PO4: Function effectively as a member or leader of a team engaged in activities appropriate to the Computer Applications discipline.

PO5: An ability to communicate and engage effectively with diverse stakeholders.

PO6: An ability to analyze impacts of computing on individuals, organizations, and society.

PO7: An ability to use appropriate techniques, skills, and tools necessary for computing practice.

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1: Gain proficiency in the practice of computing.

PSO2: Develop class environment congenial and competitive for generation of ideas, innovation and sharing.

PSO3: Prepare for continued professional development and lifelong learning on Computer Applications.

PSO4: Acquire the skill to experiment the physical properties of materials.

PSO5: Able to make effective use of Information Technology.

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

SCHEME OF EXAMINATIONS - CBCS & LOCF PATTERN

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

UG PROGRAMME

Programme: BCA Branch: Computer Applications

Part	Course Code	Course Type	Course Title	Credit points	Lecture Hours/ Week		Exam Duration (hours)	MAX. MARKS		
					Theory	Practical		I.E.	E.E	Total
			Semester – I							
I	21LA101 / 21LAH01/ 21LAM01/ 21LAF01	MIL	Tamil-I/ Hindi-I/ Malayalam – I/ French-I	4	6	-	3	30	70	100
II	21ENG01	AECC	English – I	4	6	-	3	30	70	100
III	21CAU01	DSC	**Core-I :** Programming with C	4	4	-	3	30	70	100
III	21CAU02 / 21CAGU02	DSC	**Track 1: Core -II** / **Track 2: Core -II**	4	4	-	3	30	70	100
III	21CAU03	DSC	**Core -III: Practical - I** Programming Using C	2	-	4	3	40	60	100
III	21CAU04	GE	**Allied-I** Mathematics for Computing	4	5	-	3	30	70	100
IV	21CAUE01	AEE	Open Elective - I	2	3	-	3	100	-	100
IV	21GSU01	AECC	Environmental Studies	1	2	-	2	50	-	50
IV	21CAUV01	SEC	VAC – I/Life Skills-I @ / Communicative English	1*	2	-	2	50	-	50**
IV	-	SEC	SDR-Students Development Report	Assessment will be in the Fifth Semester						
V	-	AECC	Extension Activities NSS/NCC/Sports/YRC/SIS/ SA	Assessment will be in the Fourth Semester						
Total				**25**	**32**	**4**	-	**340**	**410**	750

			Semester – II							
I	21LAT02 /21LAH02 /21LAM02 /21LAF02	MIL	Tamil-II/ Hindi-II/ Malayalam-II/ French-II	4	6	-	3	30	70	100
II	21ENG02	AECC	English – II	4	6	-	3	30	70	100
III	21CAU05	DSC	**Core -IV** : Python Programming	4	4	-	3	30	70	100
III	21CAU06	DSC	**Track 1 Core -V**	4	4	-	3	30	70	100
	21CAGU06		**Track 2 Core -V**							
III	21CAU07	DSC	**Core -VI: Practical - II:** Programming using Python	2	-	4	3	40	60	100
III	21CAU08	DSC	**Core -VII:** Multimedia Systems	3	3	-	3	30	70	100
III	21CAU09	GE	**Allied-II** Numerical Methods	4	5	-	3	30	70	100
III	21CAU10	SEC	Internship / Industrial Visit / **Mini Project**	1	-	-	-	100	-	100
IV	21CAUV02	SEC	VAC – II/Life Skills-II @ / **Language**	1*	2	-	2	50	-	50**
IV	21CAUJ01	SEC	**Aptitude / Placement Training**	Grade *	2	-	2	50	-	50**
Total				**26**	**32**	**4**	-	**320**	**480**	**800**
			Semester - III							
III	21CAU11	DSC	**Core -VIII:** Programming with JAVA	5	5	-	3	30	70	100
III	21CAU12	DSC	**Track 1 Core- IX**	5	5	-	3	30	70	100
	21CAGU12		**Track 2 Core- IX**							
III	21CAU13	DSC	**Core -X: Practical –III:** Programming using JAVA	3	-	5	3	40	60	100
III	21CAU14	DSC	**Core -XI : Practical – IV** : Web Technology Lab	3	-	5	3	40	60	100
III	21CAU15	DSC	**Core- XII:** System Software & Operating System	3	3	-	-	30	70	100
III	21CAU16	GE	**Allied-III** Operations Research	4	5	-	3	30	70	100
IV	21CAUE02	AEE	Open Elective-II	2	3	-	3	100	-	100
IV	21GSU02	AECC	Human Rights	1	2	-	2	50	-	50
IV	21CAUJ02	SEC	**Aptitude / Placement Training**	Grade *	2	-	2	50	-	50**
IV	21CAUJ03	SEC	**Online Course**	-	1	-	-	-	-	C/NC≠
Total				26	**26**	**10**	-	**350**	**400**	**750**

			Semester – IV							
III	21CAU17	DSC	**Core-XIII :** Relational Database Management System	5	5	-	3	30	70	100
III	21CAU18 / 21CAGU18	DSC	**Track 1 Core- XIV** / **Track 2 Core- XIV**	5	5	-	3	30	70	100
III	21CAU19	DSC	**Core -XV :Practical V:** RDBMS Applications	3	-	5	3	40	60	100
III	21CAU20	DSC	**Core -XVI: Practical VI:** Software Testing Tools	3	-	5	3	40	60	100
III	21CAU21	GE	**Allied-IV** Business Accounting	4	5	-	3	30	70	100
III	21CAU22	DSE	**Electives/DSE-I**	4	4	-	3	30	70	100
III	21CAU23	SEC	Internship / Institutional Training / **Mini-Project**	1	-	-	-	100	-	100
IV	21CAUV03	ACC	VAC–III	1*	2	-	2	50	-	50**
IV	21CAUJ04	SEC	**Aptitude / Placement Training**	Grade *	2	-	2	50	-	50**
IV	21CAUJ05	SEC	**Online Course**	-	1	-	-	-	-	C/NC≠
IV	21GSU03	AECC	Internet Security	1	2	-	2	50	-	50
V	21GSU04	AECC	Extension Activities NSS/NCC/SPORTS/YRC/ SIS/SA#	2	-	-	-	-	-	C/NC≠
Total				**28**	**26**	**10**	**-**	**350**	**400**	**750**
			Semester - V							
III	21CAU24	DSC	**Core --XVII :** .NET Programming	5	5	-	3	30	70	100
III	21CAU25	DSC	**Core --XVIII :** Mysql & PHP	5	5	-	3	30	70	100
III	21CAU26	DSC	**Core --XIX : Practical VII:** Programming using .NET	3	-	6	3	40	60	100
III	21CAU27 / 21CAGU27	DSC	**Track 1: Core -XX Practical - VIII** / **Track 2: Core -XX Practical - VIII**	3	-	6	3	40	60	100
III	21CAU28	DSE	**Electives/DSE - II**	4	5	-	3	30	70	100
IV	21CAUE03	AEE	Open Elective-III	2	3	-	3	100	-	100
IV	21GSU05	AECC	General Awareness	1	1	-	2	50	-	50
IV	21GSU06	AECC	Law of Ethics	1	-	-	2	50	-	50
IV	21CAUV04	ACC	VAC–IV	1*	2	-	-	50	-	50**
IV	21CAUJ06	SEC	**Aptitude / Placement Training**	Grade *	2	-	2	50	-	50**
IV	21CAUJ07	SEC	**Online Course**	-	1	-	-	-	-	C/NC≠
IV	21CAUJ08	SEC	**SDR- Student Development Report**	2*	-	-	-	-	-	-
Total				**24**	**24**	**12**	**-**	**370**	**330**	**700**

			Semester – VI							
III	21CAU29	DSE	Electives / DSE-III	4	5	-	-	30	70	100
III	21CAU30	DSE	Electives / DSE-IV	4	5	-	-	30	70	100
III	21CAU31	SEC	**Project Work /Student Research / Paper**	5	5	-	-	40	60	100
III	21CAU32	DSC	**Core-XI Self-Study Course**	3	-	-	3	30	70	100
Total				**16**	**15**	-	-	**130**	**270**	**400**
			Grand Total	**145**						**4150**

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

Range of marks	Equivalent remarks
80 and above	Exemplary
70 – 79	Very good
60 – 69	Good
50 – 59	Fair
40 – 49	Satisfactory
Below 10	Not Satisfactory = Not completed

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

PASSING MINIMUM

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

Abstract of

Scheme of Examination

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

Part	Course	Papers	Credit	Total Credits	Marks	Total Marks
Part I	Languages/ **(MIL)**	2	4	**8**	100	**200**
Part II	English/**AECC-I**	2	4	**8**	100	**200**
Part III	Core /**DSC**	21	2/3/4 /5	**77**	100	**2100**
	Allied /**GE**	4	4	**16**	100	**400**
	Electives/**DSE**	4	3 /4	**16**	100	**400**
	Project **SEC**	1	5	**5**	100	**100**
	Internship/Institutional Training Mini-Project (Summer Courses #)	*2*	*1*	*2*	*100*	*200*
Part IV	Open Electives /**AEE**	3	2	**6**	100	**300**
	EVS & Internet Security / **AECC**	5	1	5	50	**250**
	Job Oriented Course / Value Added Course	*2*	*1*	*2**	*50*	***100****
	Skill Based/ Placement/Aptitude **SEC**	4	Grade*	Grade*	50	**200****
	On line Courses/SEC	3	C/NC	C/NC	-	C/NC
	Life Skills / **SEC**	2	1	2*	50	**100****
	SDR-Student Development Report	*1*	*2*	*2**	-	-
Part V	Extension Activities NSS / NCC/Sports/YRC / SIS / SA – **AECC**	1	C/NC	2	-	-
	Total			**145(6 Extra Credits)**		**4150 + (400**)**

List of Open Elective Papers	
Open Electives	Yoga for Human ExcellenceHuman Health & Hygiene Indian Culture and Heritage Indian Constitution and Political SystemConsumer Awareness and Protection Professional Ethics and Human Values Human Rights, Women's Rights& Gender Equality Disaster Management Green Farming Corporate Relationsstart a Business? Research Methodology and IPR General Studies for Competitive ExaminationsIIT JAM Examination (for Science only) CUCET Examination
VAC Papers	
Courses offered by the Departments to other Programmes	

Note: VAC / JOC courses can be added along with the above open electives

Track 1

S. No	Subject Code	Subject Name
1.	21CAU02	Computer System Architecture
2.	21CAU06	Data Structures and Algorithms

Track 2 (Industry Integrated Course – Google)

S. No	Subject Code	Subject Name
1.	21CAGU02	G Suite
2.	21CAGU06	Professional Collaboration Engineer

List of Elective Papers/ DSE (Can choose any one of the paper as electives)		
	Course Code	Title
Electives/ **DSE-I**	21CAU22A	**Elective I:** Software Testing (OR)
	21CAU22B	**Elective I:** Computer Installation Services
Electives/ **DSE-II**	21CAU28A	**Elective II:** Introduction to Compiler Design (OR)
	21CAU28B	**Elective II:** Information Security
Electives/ **DSE-III**	21CAU29A	**Elective III:** Cloud Computing(OR)
	21CAU29B	**Elective III:** Introduction to Machine Learning (OR)
	21CAU29C	**Elective III:** Network Security and Cryptography
Electives/ **DSE-IV**	21CAU30A	**Elective IV:** Internet of Things(OR)
	21CAU30B	**Elective IV:** Deep Learning (OR)
	21CAU30C	**Elective IV:** Computer Graphics

Syllabus Coordinator

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Regulations

1.Internship / Institutional Training / **Mini-Project** is a Summer Course related to the discipline can be permitted to complete during the end of I and III semesters for one week and permitted to submit a report.

2. Project work/Dissertation is considered as a special course involving application of knowledge in solving analyzing /exploring a real-life situation / difficult problem. A Project/Dissertation work may be given in lieu of a discipline specific elective paper.

3.FAST TRACK SYSTEM

Two core courses DSE- III & DSE- IV are the subjects which are to be related with NPTEL courses.

The Students have the options of taking two subjects of the sixth semester of **BCA** through NPTEL / Swayam portal from the list given or offered by NPTEL and approved by the department for which credit transfer is permitted. The students should inform the department prior to the registration of the course and get due approval for the same. If the student completes these courses before the start of the sixth semester, the student can be considered for a fast track programme, and do the project work alone during the sixth semester apart from the self-study paper. Once the student submits the successful course completion credentials as required by the college for the NPTEL/SWAYAM online courses, then the credit transfer will be considered for qualifying the degree.

4. If the students who are all completed the NPTEL courses before Semester –V for UG can avail exemption from appearing exams of DSE- III & DSE- IV in Fast track scheme.

5. NSS / NCC/Sports/YRC / SIS / SA is mandatory for all students as per New Education Policy and the students must attend the allocated hours within two years and complete the programme. They will be evaluated during the end of second year (Fourth Semester) and also a certificate will be issued.

6.SDR – Student Development Report to be received by the department from the students till end of the fifth semester. (Evidences of Curriculum activities and Co-curriculum activities)

7.For online courses minimum of 2 certificates in any of the online platform is mandatory.

Extension Activities

NSS - National Service Scheme, as enrolled member with the College Unit.

NCC - National Credit Corps, as enrolled member with the College Unit.

SPORTS - Sports & Games Participation with College Team

YRC/RRC-Youth Red Cross / Red Ribbon Club, as enrolled member with the College Unit.

Rotaract Club - Rotaract Club, as enrolled member with the College Unit.

SIS - Special Interest Subjects, as approved by the Academic Council

SA - Social Activity for not less than 50 hours with NGGO like Aram Foundation / Shanthi Social Service / Siruthuli / KulangalPathukappuAmaipu /Old age Home / Nature Foundation / etc.

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

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

1. Internal Marks for all UG

Components	Marks
Test I	5
Test II	5
Model Exam	10
Assignment	5
Attendance*	5
TOTAL	30

***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
Total	40

b) Components for Practical E.E.

Components	Marks
Experiments	50
Record	5
Viva	5
Total	60

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 Report Viva-voce	25 50 25	- 50 50	I.E a)Attendance b)Review/Work diary*	 10 30	 40
Total	**100**	**100**	E.E** a) Final report b)Viva-voce	40 20	 60
				Total	**100**

*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. Guidelines for Internet Security/Human Rights/Law of Ethics/Environmental studies (Part IV)

Components	Marks
Two Tests (each 2 hours) of 20 marks each [4 out of 7 descriptive type questions 4 x 5 = 20 Marks]	40
Two assignments (2 x 5)	10
Total	**50**

5. Guidelines for General Awareness (Part IV)

Components	Marks
Two Tests (each 2 hours) of 25 marks each [50 objective type questions 5 0 x 1/2 = 25 Marks]	50

6. Guidelines for Open Elective (Part IV)

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

7. Value Added Courses / Aptitude/Placement courses:

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

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 and 7are to be treated as 100% Internal papers.
4. For item No.07, 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 (2x12 = 24 marks)
Answer any **TWO** Questions out of **THREE** Questions
ALL Questions Carry **EQUAL** Marks
(Q.No: 11 to 13)

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 (5x6=30 Marks)
Answer ALL Question
ALL Questions Carry **EQUAL** Marks
(Q.No 11 to 15 Either or type)
(One question from each Unit)

SECTION- C (3x10=30 Marks)
Answer any **THREE** Questions out of **FIVE** Questions
ALL Questions carry **EQUAL** Marks
(Q.No 16 to 20) (One question from each Unit)

For UG (Question paper pattern) (Max. 70 marks)

Sec–A (10x1=10marks)	All Questions will be in K1 Level
Sec–B (5x6=30marks) Either or type	4 Questions will be in K1 Level, 3 Questions will be in K2, K3 each
Sec–C (3x10=30marks) Any 3 out of 5 questions	2 Questions will be in K2, 3 Questions will be in K3 & K4 level

Track-2 (Google – Mobile App Development with Google Technologies)

For Semester – I both MCQ and Analytical Type Questions will be followed

1. **30-70 Pattern Policy**
   a. **30 Marks Internals**

Components	Marks
MCQ	20
Analytical Pattern	5
Class Attendance*	5
TOTAL	30

***Split-up of Attendance Marks**

- Below 75 = 0 mark
- Above 75-80 - 1 marks
- Above 80-85 - 2 marks
- Above 85-90 - 3 marks
- Above 90-95 - 4 marks
- Above 95-100 -5 marks

   b. **Continuous Assessment Test**
      i. Tests will be conducted under 25 marks Pattern
      ii. MCQ = 20(20*1= 20 Marks)
      iii. Analytical Pattern = 5 (5*1= 5 Marks)
      iv. Best of 2 Continuous Assessment Test will be considered for Internal 30 Marks

2. **70 Marks Externals**
   Online Exam with objective Pattern will be conducted for MCQ = 50 Marks &
   Analytical Pattern = 20 Marks

For Semester – II only MCQ Type Questions will be followed

1.30-70 Pattern Policy
   a. **30 Marks Internals**

Components	Marks
MCQ	25
Class Attendance*	5
TOTAL	30

   b .Continuous Assessment Test
      i. Tests will be conducted under 25 marks Pattern
      ii. MCQ= 25(25*1=25 Marks)
      iii. Best of 2 Continuous Assessment Test will be considered for Internal 30Marks

2. **70 Marks Externals**
   Online Exam with objective Pattern will be conducted for MCQ = 70(70*1=70 Marks)
3. **Final Exam (Global Certification Exam)**
   - The pattern that follows exactly Google Certification Exam pattern.
   - Online Exam will be conducted with MCQ and Analytical pattern.
   - Global Certification will be provided to students who clear the examination in the first attempt, if not, the candidate can appear after 14 days, third attempt after 60 days, and fourth attempt after 365 days.
   - If not, Candidate can reappear for the examination conducted by industry experts.
     - The minimum passing should be 40%.
   - Global Certification will be issued as whether the candidate is Certified or Not.
   - The certification expires after 2 years and students will need to get re-certified to maintain their certification status after 2 years

Guideline for Industry oriented Program

1. The minimum passing should be 40%.
2. Global Certification will be provided to students who clear the examination in the first attempt, if not, the candidate can appear after 14 days, third attempt after 60 days, fourth attempt after 365 days.
3. If not, he/she can reappear for the examination conducted by industry experts.

The certification expires after 2 years and students will need to get re-certified to maintain their certification status after 2 years.

Course Code:	21CAU01	Course Title						Batch:	2021-2022 & onwards
		Programming with C						Semester:	I
Hrs/Week:	4	L	4	T	-	P	-	Credits:	4

COURSE OBJECTIVE

- To impart adequate knowledge on the need of programming languages and problem solving techniques.
- To develop an in-depth understanding of functional and logical concepts of C Programming.
- To familiarize the basic syntax and semantics of C Language.
- To develop programs using pre-processor directives and Files.
- Introduces the more advanced features of the C language.

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Recollect various programming constructs and to develop C programs.	K1
CO2	Understand the fundamentals of C programming	K2
CO3	Choose the right data representation formats based on the requirements of the problem.	K3
CO4	Compare different Operations on arrays, functions, pointers, structures, unions and files.	K4
CO5	Illustrate the concepts of various data structures.	K3

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze

SYLLABUS

Course Code 21CAU01	Programming with C	Sem: I
Unit No.	**Topics**	**Hours**
I	**Introduction to C**: 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.	10
II	**Decision Control and Looping Statements:** Introduction to Decision Control Statements –Conditional Branching Statements –Looping Statements –Nested Loops –Jumps in loops – Goto Statement. **Functions**: Introduction –using functions –Function declaration –Function definition –Function call –Return statement –Categories of Functions–Recursive function.	10
III	**Arrays:** Introduction –One dimensional- Declaration of Arrays –Two dimensional –Multi dimensional –Dynamic arrays – Character arrays and Strings. **Pointers:** 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.	10
IV	**Structure and Union**: Introduction- Defining a Structures- Declaring structure variables-Accessing Structure members-Initialization-Array of structures-Arrays within structures-Structure within structures-Unions.**Files:** Introduction to Files –Defining and opening a file-Closing a file-I/O operation on files-Random access to files-Command line arguments.	9
V	**Dynamic Memory Allocation and Linked List**: Introduction-Allocating a block of memory-Multiple block of memory-Altering the size of block-Concept of linked list-Advantage-Types-Pointers revisited-Creating linked list-Inserting-Deleting-Application of linked list.	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. E.Balagurusamy, "Computing Fundamentals and C Programming", TMH 7th reprint 2011

REFERENCE BOOKS

1.E.Balaguruswami, " Programming in ANSI C", TMH 21st reprint 1998

2 .Y.Kanetkar, "Let us C", BPB Publications, 15thEdition 2017 revised.

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

WEB RESOURCES

Web Link:

1. https://www.tutorialspoint.com/cprogramming/index.html
2. https://www.geeksforgeeks.org/c-language-set-1-introduction/
3. https://fresh2refresh.com/c-programming/

MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
Mr.M.Karthi Name & Signature of the Staff	Dr. P. Senthil Vadivu Name & Signature	

Dr. P. SENTHIL VADIVU,
M.Sc.,M.Phil.,Ph.D.,
Head & Associate Professor
Dept. of Computer Applications
Hindusthan College of Arts & Science
Coimbatore - 641 028.

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

Course Code:	21CAU02	Course Title							Batch:	2021-2022 & Onwards
		Computer System Architecture							Semester:	I
Hrs/Week:	4	L	4	T	-	P	-		Credits:	4

COURSEOBJECTIVE

- 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.
- Inculcate knowledge on multiprocessor concepts

COURSE OUTCOMES (CO)

S.No	COURSEOUTCOME	BLOOMS LEVEL
CO1	Describe various data representation and logic circuits and components of Computers.	K1
CO2	Discuss the basic concepts of computer organization and Architecture	K2
CO3	Explain the internal components of combinational circuits, CPU, I/O and Memory.	K3
CO4	Analyze the design of Logic Circuits ,CPU, IO and Memory	K4
CO5	Discuss the concepts of multiprocessor.	K2

K1- Remember, K2-Understand, K3-Apply, K4-Analyze

SYLLABUS

21CAU02	Computer System Architecture	Sem: I
Unit No.	**Topics**	**Hours**
I	**Data Representation:** Number Systems-Binary-Octal-Hexadecimal number-Complements-Floating Point Representation-Other Binary codes –Error Detection Codes - **Logic Circuits:** Logic Gates-Combinational Circuits-Half-Adder-Full-Adder- Flip-Flops-SR - JK – D and Tflip-flop.	9
II	**Basic computer organization:** Instruction codes-Computer registers-Computer instructions - Timing and Control - Instruction cycle-Memory - Reference Instructions - Input-output and interrupt - Complete computer description.	10
III	**Central processing unit:** 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) - Characteristics of RISC and CISC-Comparison of RISC and CISC. **Pipeline and Vector Processing:** Parallel processing - Pipelining - Arithmetic Pipeline - Instruction Pipeline - RISC Pipeline – Vector Processing.	10
IV	**Input – Output organization:** Input-output interface - Asynchronous Data Transfer - Modes of Transfer - Priority Interrupt – DMA - Input-Output Processor (IOP) - CPU-IOP Communication - Serial Communication.	10
V	**Memory Organization:** Memory Sub System - Memory hierarchy - Main memory - Auxiliary memory - Flash memory - Associative memory - Cache memory - Virtual memory. **Multiprocessors**: Characteristics- Interprocessor Arbitration- Interprocessor Communication and Synchronization- Cache Coherence **Self Study :** Intel 8086 Microprocessor	9

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

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

TEXT BOOK

1. M. Morris Mano, "Computer System and Architecture", Pearson Education, Third Edition, (30 June2017).

REFERENCE BOOKS

1. Badri Ram , "Advanced Microprocessors and Interfacing", TMH, 2012.
2. W. Stallings, "ComputerOrganization&Architecture", PearsonEducation, 8th Edition.2012.
3. M.Carter, "ComputerArchitecture", Schaum'soutlineseries, TMH, SpecialIndian Edition.

WEB RESOURCES

Web Link:

1. https://www.javatpoint.com/computer-organization-and-architecture-tutorial
2. https://www.tutorialspoint.com/computer_logical_organization/index.htm
3. https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/

MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
Mrs.K.Mythili Name & Signature of the Staff	Dr. P. Senthil Vadivu Name & Signature	..

Dr. P. SENTHIL VADIVU, M.Sc.,M.Phil.,Ph.D.,
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Curriculum Development Cell
Hindusthan College of Arts & Science,
Coimbatore-641 028.

Course Code:	21CAGU02	G SUITE						Batch:	2020-2021 & Onwards
								Semester:	I
Hrs/Week:	4	L	4	T	-	P	-	Credits:	4

COURSE OUTCOMES (CO)

COURSE OBJECTIVE:

1. To be familiar with Drive, Gmail, Hangouts Meet.
2. To be familiar with Docs, Sheets, Forms, Slides.
3. To understand the concept of Folders.
4. To be familiar with using Gmail offline.
5. Students will be ready to take the Google G Suite certification.

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Understand the management of Files, Folders in Drive	K1
CO2	Demonstrate the Effective use of Gmail offline.	K2
CO3	Apply hangout techniques	K3
CO4	Analyze Applications using sheets and forms	K4
CO5	Demonstrating the effective use of working with slides	K2

SYLLABUS

21CAGU02	G SUITE	Sem: I
Unit No.	**Topics**	**Hours**
I	Managing files in Drive - Creating and managing folders in Drive - Locating files - Sharing files and folders.	10
II	Personalizing settings in G Mail - Managing G Mail Inbox - Managing and communicating with Contacts - Locating Messages - Using G Mail offline.	10
III	Scheduling a Hangout- Working and collaborating in Docs	10
IV	Working in Sheets and Forms	9
V	Working in Slides	9

Note: MCQ type questions – 25 Marks, Analytical type questions 5 Marks Total 30 Marks
Teaching methods: slides projection through LCD, Assignments and class tests

TEXT BOOKS

No text book required. Students will use their college G Suite for Education ID as a learning tool. Online material is available - https://gsuite.google.co.in/intl/en_in/training/

REFERENCE BOOKS

Reference Links:- https://gsuite.google.co.in/intl/en_in/training/

WEB RESOURCES

MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN: G SUITE CERTIFICATION

Follows Track –2 (Industry Oriented Program with Google Technologies) pattern of Internal and External Assessment as mention in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
Name & Signature of the Staff	Dr. P. Senthil Vadivu Name & Signature	

Dr. P. SENTHIL VADIVU, M.Sc., M.Phil., Ph.D.,
Head & Associate Professor
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Co-ordinator
Curriculum Development Cell
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Coimbatore-641 028.

Course Code:	21CAU03	Course Title						Batch:	2021-2022 & onwards
		Practical – I : Programming using C						Semester:	I
Hrs/Week:	4	L	-	T	-	P	4	Credits:	2

COURSE OBJECTIVE

1. To learn the fundamentals of C Programming
2. To enhance their analyzing and problem solving skills
3. To gain knowledge about arrays, structures, pointers and functions
4. To develop the ability to apply file I/O operations.
5. To develop skills to design and analyze simple linear data structures.

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Choose the right data representation formats based on the requirements of the problem.	K3
CO2	Compare the various programming constructs and choosethe 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
CO5	Develop C program for Linear data structure operations and its applications	K3
K1 – Remember, K2 – Understand, K3 – Apply, K4 - Analyze		

SYLLABUS

21CAU03	Practical II: 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 Multiply two Matrices by Passing Matrix to a Function	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 Find Largest Number Using Dynamic Memory Allocation	4
11	Program to read and write a file line by line.	4
12	Program to know the working of linked list.	4

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

Teaching methods: PowerPoint Projection through LCD, Demonstration

MAPPING WITH PROGRAM OUTCOMES

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M	S	S	S	M	-
CO2	S	S	S	M	S	S	M
CO3	S	S	S	S	S	M	-
CO4	M	S	M	S	S	S	M
CO5	S	M	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
Mr.M.Karthi Name & Signature of the Staff	Dr. P. Senthil Vadivu Name & Signature	

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Co-ordinator
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Coimbatore-641 028.

Course Code:	21CAU05	Python Programming						Batch:	2021-2022 & Onwards
								Semester:	II
Hrs/Week:	4	L	4	T	-	P	-	Credits:	4

COURSE OBJECTIVE:

1. To describe the Fundamental elements of Python programming basics and paradigm.
2. To Discover the Knowledge on functions and pass arguments in Python.
3. To Relate about List, Dictionaries, Tuples and Files.
4. Solve the problems using String Concepts.
5. Interpret the concepts of object oriented programs with Python classes.

COURSE OUTCOMES (CO):

S. No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Describe the Syntax and semantics of Python Programming Languages.	K1
CO2	Observe the fundamental principles of Object-Oriented Programming	K1
CO3	Discuss the programming concepts to solve real world problems using Functions and Modules.	K2
CO4	Experiment with structuring the data using Lists, Dictionaries, and Tuples.	K3
CO5	Applying File Concepts to read and write data operations.	K4

K1 – Remember, K2 – Understand, K3 – Apply, K4 - Analyze

SYLLABUS

21CAU05	Python Programming	Sem: II
Unit No.	**Topics**	**Hours**
I	**Getting Started with Python Programming**: Running Code in the Interactive Shell ,Input, Processing, and Output, Editing, Saving, and Running a Script , Behind the Scenes: How Python Works, Detecting and Correcting Syntax Errors, Strings, Assignment, and Comments **Data Types:** String Literals, Escape Sequences, String Concatenation, Variables and the Assignment Statement, Program Comments and Doc strings, Numeric Data Types and Character Sets, Integers , Floating-Point , Character Sets , Arithmetic Expressions, Mixed-Mode Arithmetic and Type Conversions .	10
II	**Using Functions and Modules**: Calling Functions: Arguments and Return Values, The math Module, The Main Module, Program Format and Structure, Running a Script from a Terminal Command Prompt. **Loops and Selection Statements:** Definite Iteration: The for Loop , Executing a Statement a Given Number of , Count-Controlled Loops , Augmented Assignment , Loop Errors: Off-by-One Error, Traversing the Contents of a Data Sequence , Specifying the Steps in the Range , Loops That Count Down .Statements Conditional Iteration: The while Loop The Structure and Behavior of a while Loop Count Control with a while Loop The while True Loop and the break Statement, Random Numbers, Loop Logic, Errors, and Testing	10
III	**Selection: if and if-else Statements:** The Boolean Type, Comparisons, and Boolean Expressions, if-else Statements, One-Way Selection Statements, Multi-Way if Statements, Logical Operators and Compound Boolean Expressions, Short-Circuit Evaluation , Testing Selection **Lists and Dictionaries:** **Lists: List** Literals and Basic Operators, Replacing an Element in a List, List Methods for Inserting and Removing Elements , Searching a List, Sorting a List , Mutator Methods and the Value None , Aliasing and Side Effects , Equality: Object Identity and Structural Equivalence, Tuples. **Defining Functions:** The Syntax of Simple Function Definitions, Parameters and Arguments, The return Statement, Boolean Functions, Defining a main Function Case Study: Generating Sentences	10
IV	**Strings:** Accessing Characters and Substrings in Strings, The Structure of Strings, The Subscript Operator, slicing for Substrings, Testing for a Substring with the in Operator, String Methods **Text Files :** Text Files and Their Format, Writing Text to a File, Writing Numbers to a File , Reading Text from a File , Reading Numbers from a File , Accessing and Manipulating Files and Directories on Disk .	10
V	**Classes and OOP:** classes, objects, attributes and methods; defining classes; design with classes, data modeling; persistent storage of objects, Inheritance, polymorphism, operator overloading (_eq_, _str_, etc); abstract classes; exception handling, try block	8

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

Teaching methods: Slides Projection through LCD, Assignments and Class Tests

TEXT BOOKS

1. *Fundamentals of Python: First Programs, Second Edition Kenneth A. Lambert, Cengage Learning, 2019 .*
2. *Updated for Python 3, Shroff/O'Reilly Publishers, 2016 http://greenteapress.com/wp/think-python*

REFERENCE BOOKS

1. *Allen Downey, Jeffrey Elkner, Chris Meyers.How to think like a computer scientist learning with Python / 1st Edition,2012*
2. *Dr.K.Selvamani, Dr K Kulothungan, Dr E Anbalagam, Dr. R RameshProblem, solving and Python Programming, Sri Maruthi Publishers, 2019.*
3. *Timothy A. Budd , Exploring Python,12th Edition, McGraw Hill , 2010.*

WEB RESOURCES

https://www.learnpython.org/
https://www.tutorialspoint.com/python/index.htm
http://greenteapress.com/wp/think-python

MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

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

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
Dr.P.Lalitha	Dr. P. Senthil Vadivu	
Name & Signature of the Staff	Name & Signature	

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

Course Code:	21CAU06	Course Title							Batch:	2021-2022 & Onwards
		Data Structures and Algorithms							Semester:	II
Hrs/Week:	5	L	5	T	-	P	-		Credits:	4

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.
- Develop skills to apply appropriate data structures in problem solving.
- Explore the concepts of File Organizations, Symbol tables, Searching and sorting techniques.

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Define basic types for data structure, implementation and application	K1
CO2	Illustrate the procedures for implementing data structures and algorithms.	K2
CO3	Develop programming skills to apply appropriate data structures in problem solving.	K3
CO4	Analyze Linear and Non-Linear data structures, file organization, searching and sorting techniques	K4
CO5	Select appropriate tree and graph for solving the given problem.	K4
K1- Remember, K2-Understand, K3-Apply, K4-Analyze		

SYLLABUS

21CAU06	Data Structures and Algorithms	Sem: II
Unit No.	**Topics**	**Hours**
I	**Introduction to Algorithms** :Asymptotic Notations: Big-Oh, Omega and Theta- Best, Worst and Average case Analysis: Definition and an example - Arrays - Stacks and Queues - Fundamentals. **Linked List:**-Singly Linked List - Doubly linked list -Sparse Matrices-Polynomial addition.	12
II	**Trees:** Binary tree representations – Binary Tree Traversal – Threaded Binary Trees -Counting binary trees. **Graphs:** Terminology and representations - Traversals, Connected Components.	12
III	**Internal sorting** – Searching-Insertion sort-Quick sort-Heap Sort-2 way merge sort-Sorting on several keys. **External Sorting**: Storage device- Magnetic tape - Disk storage - Sorting with disk- K-way merging -Sorting with tape-Balanced Merge sorts-PolyphaseMerge.	12
IV	**Symbol tables:** Static tree table - Dynamic Tree tables-Hash tables -Hashing Functions-overflow handling-Theoretical evaluation of overflow techniques. **Files:** Files, Queries and Sequential organizations	12
V	**Index Techniques:**-Hashed Index-tree indexing-B trees. **File organizations:** Sequential organizations-Random Organization- Linked Organization- Inverted Files-Storage Management.	12

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

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

TEXT BOOK

1. *Ellis Horowitz, SartajSahni, Susan Anderson Freed, "Fundamentals Of Data Structures In C", Universities Press (India) Limited ,2017*

REFERENCE BOOKS

1. *MarkAllenWeiss, "DataStructure and Algorithm analysis in ", Pearson Education, Second Edition, Sixteenth Impression2014.*
2. *Alfred V. Aho, John E. Hopcroft and Jeffry D. Ullman, Data Structures and Algorithms, Pearson Education, New Delhi,2006*
3. *Reema Thareja, "Data Structures using C", Second Edition, Oxford University Press, 2011*

WEB RESOURCES

Web Link:

1. *https://www.tutorialspoint.com/data_structures_algorithms/index.htm*
2. *https://www.javatpoint.com/data-structure-introduction*
3. *https://www.geeksforgeeks.org/data-structures/*

MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN

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

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
Ms.G.Priyanka Name & Signature of the Staff	Dr. P. Senthil Vadivu Name & Signature	

Dr. P. SENTHIL VADIVU, M.Sc.,M.Phil.,Ph.D.,
Head & Associate Professor
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Co-ordinator
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Coimbatore-641 028.

Course Code:	21CAGU06	Professional Collaboration Engineer						Batch:	2020-2021 & Onwards
								Semester:	II
Hrs/Week:	4	L	4	T	-	P	-	Credits:	4

COURSE OBJECTIVE:

1. To be familiar with managing the G Suite Administrator Console.
2. To be able to manage various Apps in the organization domain.
3. Learn shortcut methods for Administrating the G suite Tools.
4. Students will be able to plan Advance G suite Console.
5. Students will be ready to take certification.

COURSE OUTCOMES (CO)

S. No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Understand the G suite Console	K1
CO2	Explain the effective user management in the G Suite Admin Console	K2
CO3	Control of G suite Services	K3
CO4	Develop and Create Apps.	K4
CO5	Plan to administer the G Suite Admin Console	K3

K1- Remember, K2-Understand, K3-Apply, K4-Analyze

SYLLABUS

21CAGU06	Professional Collaboration Engineer	Sem: II
Unit No.	Topics	Hours
I	Planning and Implementing G Suite authorization and access	10
II	Managing user, resource, and Team Drive lifecycles	9
III	Managing mail, Controlling and configuring G Suite services	9
IV	Configuring and managing content access Configuring and managing endpoint access	10
V	Monitoring organizational operations, Advancing G Suite adoption and collaboration	10

Note: MCQ type questions – 30 Marks.

Teaching methods: slides projection through LCD, Assignments and class tests
Example: *Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.*

TEXT BOOKS

https://support.google.com/a/?hl=en#topic=4388346

REFERENCE BOOKS

Reference Books: *NA*

WEB RESOURCES

Web Link: https://support.google.com/a/?hl=en#topic=4388346

MAPPING WITH PROGRAM OUTCOMES

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

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN: PCE CERTIFICATION EXAM

Follows Track –2 (Industry Oriented Program with Google Technologies) pattern of Internal and External Assessment as mention in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
Name & Signature of the Staff	Dr.P.Senthil Vadivu Name & Signature	

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Coimbatore-641 028.

Course Code:	21CAU07	Practical II: Programming Using Python						Batch:	2021-2022& Onwards
								Semester:	II
Hrs/Week:	4	L	-	T	-	P	4	Credits:	2

COURSE OBJECTIVE:

1. Developing adequate skills in python programming.
2. Write, Test and Debug Python Programs.
3. Implementation of Data Structure Concepts using Python.
4. Implementation of various applications using Python.
5. Interpret Object oriented programming using Python.

COURSE OUTCOMES (CO):

S. No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Understate and debug Python Programs.	K2
CO2	Apply Branching and looping concepts in Python Programs.	K3
CO3	Analyze and apply Data structure concepts using python programming.	K4,K3
CO4	Develop applications using Object oriented Programming.	K3
CO5	Develop application for Bio computing	K3
K1- Remember, K2-Understand, K3-Apply, K4-Analyze		

SYLLABUS

21CAU07	Practical II: Programming Using Python	Sem: II
Ex. No.	Program List	Hours
1	Program to find first n prime numbers.	6
2	Program to find the exponentiation of a number.	4
3	Program to perform Binary Search.	4
4	Program to implement Linear Search.	5
5	Program to perform Classes and methods	5
6	Program to perform polymorphism	5
7	Program to perform Inheritance	5
8	Program to perform Encapsulation	5
9	Gene Sequence mining using Python.	5
10	Bio computing in Python.	4

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

Teaching methods: Demonstration through LCD, Lab Practice and Class Tests

MAPPING WITH PROGRAM OUTCOMES

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	P07
CO1	S	S	S	M	M	-	S
CO2	S	M	M	M	M	M	S
CO3	S	S	S	M	-	M	S
CO4	S	S	M	M	-	M	S
CO5	M	M	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
Dr.P.Lalitha Name & Signature of the Staff	Dr.P.Senthil Vadivu Name & Signature	

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

Course Code:	21CAU08	Course Title						Batch:	2021-2022 & onwards
		Elective I: Multimedia Systems						Semester:	II
Hrs/Week:	3	L	4	T	4	P	-	Credits:	3

COURSE OBJECTIVE:

1. Understand the concepts of graphics color and image
2. Applying the programming media concepts
3. Apply image compression standards
4. Analyze the concept of video representation
5. To understand the concept of Multimedia communication

COURSE OUTCOMES (CO):

S. No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Apply image and colors	K3
CO2	Illustrate the process of Data compression	K2
CO3	Analyze the digital representation of sound	K4
CO4	Understand the details of video compression	K2
CO5	Apply the multimedia communication	K3

K1- Remember, K2-Understand, K3-Apply, K4-Analyze

21CAU08	Multimedia Systems	Sem: II
Unit No.	Topics	Hours
I	**Getting Started with Multimedia Systems**: Introduction, Definition of Multimedia, Characteristics of Data Streams, Multimedia Application Scenarios, History of Multimedia, Multimedia Basics, Digital Audio, Characteristics of Analog Audio, The Psychoacoustic Model, Speech: Representation, Synthesis and Recognition, Audio Formats, MIDI. **Images, Graphics and Color:** Human Visual Perception , Color Models, Image Formats, Graphics Formats, Digital Video, Characteristics of Motion, Persistence of Vision, Television, CRTs, LCDs and Plasma, Color Models for Video, Video Formats (NTSC, PAL-SECAM, HDTV).	7
II	**Programming Media**: Programming Sound, Java Sound API, Windows Media API,QuickTime Audio Codecs, Programming Graphics, Java Image Processing API, Windows Imaging API, Open GL, Programming Video, Java Media Framework. Windows Media API, QuickTime Video Codecs. **Lossless Compression** :Information Theory, Shannon-Fano Coding, Huffman Coding, Adaptive Coding, Adaptive Huffman, Arithmetic Coding, Dictionary-based Coding, Compression with Loss, Image Compression: The Concept, Joint Photographic Experts Group (JPEG), Hierarchical JPEG, Lossless JPEG, Graphics Interchange Format (GIF), Portable Network Graphics (PNG),	7
III	**Image Compression & Standards** Making still images: Editing and capturing images; Scanning images; Computer color models: Color palettes, Vector drawing, 3 -D drawing and rendering. JPEG-Objectives and Architecture: JPEG-DCT encoding and quantization. JPEG statistical coding, JPEG predictive loss less coding, JPEG performance. Overview of other image file formats as GIF, TIFF, BMP, PNG etc. **Digital representation of sound:** Time domain sampled representation, Method of encoding the analog signals, Sub-band coding, Fourier method: Transmission of digital sound, Digital audio signal processing, Stereophonic & quadraphonic signal processing, Editing sampled sound.	8
IV	**Virtual Reality** Applications of multimedia, Intelligent multimedia system, Desktop Virtual Reality (VR). VR operating System, Virtual environment displays and orientation tracking. Visually coupled system requirements, Intelligent VR software systems. Applications of environments in various fields viz. Entertainment manufacturing. Business, education, etc. **Video Compression:** Persistence of Vision Revisited, Motion Estimation, Motion JPEG, Bi-directional Coding, Motion Picture Experts Group (MPEG).	7
V	**Storage, Retrieval and Presentation of Media** Portable low-form factor Media, DLT for Audio, Optical Storage, Compact Disc Audio (CD), Digital Versatile Disc (DVD), Presentation, Dolby Sound, Synchronization, Multimedia Databases **Multimedia Communications** Multimedia Networking Applications, Streaming Media, Media on Demand, Real-Time Transmission Protocol, Real-Time Streaming Protocol, Hyper Text Markup Language, Synchronized Multimedia Integration Language (SMIL).	7

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

Teaching methods: Slides Projection through LCD, Assignments and Class Tests

TEXT BOOKS

1. *Multimedia SystemsConcepts Standards and Practice: Ramesh Yerraballi*

REFERENCE BOOKS

1. *Multimedia: Production, Planning and Delivery, Villamil & Molina, PHI*
2. *Multimedia: An Introduction, Villamil& Molina, PHI.*

WEB RESOURCES

https://users.ece.utexas.edu/~ryerraballi/MSB/Contents.html

MAPPING WITH PROGRAM OUTCOMES

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	M	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S
CO3	M	S	S	M	S	S	S
CO4	S	S	S	S	S	S	S
CO5	S	S	M	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
R. Jayakumar Mr.R.Jayakumar Name & Signature of the Staff	Dr. P. Senthil Vadivu Name & Signature	

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

Course Code:	21CAU22B	COMPUTER INSTALLATION AND SERVICES	Batch:	2021 - 2022
			Semester:	II
Hrs/Week:	3		Credits:	3

COURSE OBJECTIVE:

1. On Successful Completion of this subject the students should have a thorough knowledge on the different components of the computer and how to install the various hardware devices.
2. Develops student's technology skills required for troubleshooting computer software and hardware problems.
3. Find and edit basic input/output system (BIOS) settings.
4. Select and install the correct memory module and identify the elements, expectations, and requirements of the program.
5. To understand about the computer virus and troubleshooting techniques for data security

S. No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Tell the functionality of different parts of system.	K1
CO2	Develop the fundamental principles of using laptops and portable devices	K3
CO3	Classify the I/O Ports, Keyboard, Mouse Interface	K2
CO4	Test for the Knowledge about PC's Memory Organization and Troubleshooting tools	K4
CO5	Understand the various trouble shooting Techniques	K2
K1- Remember, K2-Understand, K3-Apply, K4-Analyze		

SYLLABUS

21CAU22B	COMPUTER INSTALLATION AND SERVICES	SEM:II
Unit No.	**Topics**	**Hours**
Unit I	Personal Computer Components-fundamental principles of using personal computers-purposes and characteristics of storage devices - purposes and characteristics of motherboards - purposes and characteristics of power supplies-purposes and characteristics of processor and CPUs - purposes and characteristics of memory -purposes and characteristics of display devices - purposes and characteristics of input devices - purposes and characteristics of adapter cards - purposes and characteristics of ports and cables - purposes and characteristics of cooling systems .	7
Unit II	Laptops and Portable Devices - the fundamental principles of using laptops and portable devices - purposes and characteristics of laptop-specific technologies- Identify and distinguish between mobile and desktop motherboards and processors including throttling, power management and WiFi - Install, configure, optimize and upgrade laptops and portable devices- Configure power management - Identify tools, basic diagnostic procedures and troubleshooting techniques for laptops and portable devices - Perform preventive maintenance on laptops and portable devices - Implement software security preventive maintenance techniques .	7
Unit III	**Input and Output Devices** Keyboard-Mouse-Scanner-Digitizer-Digital Camera-Monitors and Adapters-CRT-VGA –Display Controllers – Digital Display Technology – CRT Controller – Graphic Cards-Printers - Dot Matrix Printer – Plotters – Laser Printers – Inkjet Printers- Install, configure, optimize and upgrade personal computer components - Add, remove and configure internal and external storage devices - Install display devices - Add, remove and configure basic input and multimedia devices.	7
Unit IV	**On-Board Memory** PC's Memory Organization-DRAM - SDRAM – FPM DRAM -EDO DRAM - DDR SDRAM –DR DRAM – Cache – Virtual-Memory-Memory packaging-SIMM- DIMM- RIMM-I/OPorts: Serial – Parallel – USB – Game Port-External Memory-Hard Disk: Hard Disk Drive Sub Assemblies-Hard Disk Controller-MMX: CD-ROM Disk-CD-ROM Drive-DVD-Sound Blaster-Video on Pc.	7
Unit V	**Computer Troubleshooting and Maintenance** Power supply - Troubleshooting and Services -POST – Troubleshooting the Motherboard - Troubleshooting the Keyboard - Troubleshooting the HDD - Troubleshooting the Printer - Diagnostic software –Microsoft Diagnostic – Norton Utilities – QA Plus – ATDIAGS - Data Security: Computer Virus – Virus Prevention Techniques - Firewalls- Computers and Communications-Networking- LAN-WAN-Network Component- MODEM – Interrupt.	8

TEXT BOOKS

1 *Computer Service and Repair, Richard M. Roberts- G-W Publisher, 5th Edition 2021*

REFERENCE BOOKS

1 *Networking Fundamentals, Richard M. Roberts -G-W Publisher, 3rd Edition 2020*
2 *Upgrading & Repairing PCs Scott Mueller's – Publisher Que, 22nd Edition 2015*
3 *Computer Installation & Servicing, D Balasubramanian -McGraw Hill Education2nd Edition 2005*

WEB RESOURCES

https://wptcpdy.in/wp-content/uploads/2019/01/Comp.HW-Servicing-Networking.pdf

MAPPING WITH PROGRAM OUTCOMES

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	M	S	S	S	M	S	S
CO2	S	S	S	S	S	M	S
CO3	S	S	S	S	S	S	S
CO4	M	S	S	S	M	S	M
CO5	S	M	S	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
Mrs P.Vanitha Name & Signature of the Staff	Dr. P. Senthil Vadivu Name & Signature	

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