

LEARNING OUTCOMES–BASED CURRICULUM FRAMEWORK (LOCF)

in the

UNDERGRADUATE PROGRAMME

Bachelor of Computer Applications - BCA

FOR THE STUDENTS ADMITTED FROM THE

ACADEMIC YEAR 2022 - 2023 AND ONWARDS



**HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)
(Affiliated to Bharathiar University and Accredited by NAAC) COIMBATORE-641028
TAMILNADU, INDIA.**

Phone: 0422-4440555

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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 2022-2023 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	22LAT01/ 22LAH01/ 22LAM01/ 22LAF01	MIL	Tamil-I Hindi-I/ Malayalam-I/ French-I	4	6	-	3	50	50	100
II	22ENG01	AECC	English-I	4	6	-	3	50	50	100
III	22CAU01	DSC	Core-I :Programming with C	4	4	-	3	50	50	100
III	22CAU02	DSC	Track 1:Core -II	4	4	-	3	50	50	100
	22CAGU02		Track 2: Core -II							
III	22CAU03	DSC	Core-III: Practical -I Programming Using C	2	-	4	3	50	50	100
III	22CAU04	GE	Allied-I Mathematics for Computing	4	5	-	3	50	50	100
IV	22CAUE01	AEE	Open Elective - I	2	3	-	3	100	-	100
IV	22GSU01	AECC	Environmental Studies	1	2	-	2	50	-	50
IV	22CAUV01	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 ActivitiesNSS/NCC/Sports/YR C/SIS/SA	Assessment will be in the Fourth Semester						
Total				25	32	4	-	450	300	750
Semester-II										
I	22LAT02 /22LAH02 /22LAM02 /22LAF02	MIL	Tamil-II/Hindi- II/Malayalam- II/French-II	4	6	-	3	50	50	100

II	22ENG02	AECC	English- II	4	6	-	3	50	50	100
III	22CAU05	DSC	Core-IV: Python Programming	4	4	-	3	50	50	100
III	22CAU06	DSC	Track 1:Core V	4	4	-	3	50	50	100
	22CAGU06		Track2 :Core V							
III	22CAU07	DSC	Core-VI: Practical -II: Programming using Python	2	-	4	3	50	50	100
III	22CAU08	DSC	Core-VII: Multimedia Systems	3	3	-	3	50	50	100
III	22CAU09	GE	Allied-II Numerical Methods	4	5	-	3	50	50	100
III	22CAU10	SEC	Internship/Industrial Visit/ Mini Project	1	-	-	-	100	-	100
IV	22CAUV02	SEC	VAC-II/Life Skills-II(@)/ Language	1*	2	-	2	50	-	50*
IV	22CAUJ01	SEC	Aptitude/Placement Training	Grade *	2	-	2	50	-	50*
Total				26	32	4	-	450	350	800
Semester-III										
III	22CAU11	DSC	Core-VIII: Programming with JAVA	5	5	-	3	50	50	100
III	22CAU12	DSC	Track1: Core-IX	5	5	-	3	50	50	100
	22CAGU12		Track2: Core-IX							
III	22CAU13	DSC	Core-X:Practical -III: Programming using JAVA	3	-	5	3	50	50	100
III	22CAU14	DSC	Core -XI : Practical - IV :Web Technology	3	-	5	3	50	50	100
III	22CAU15	DSC	Core- XII: Operating Systems	3	3	-	-	50	50	100
III	22CAU16	GE	Allied-III: Operations Research	4	5	-	3	50	50	100
IV	22CAUE02	AEE	Open Elective-II	2	3	-	3	100	-	100
IV	22GSU02	AECC	Human Rights	1	2	-	2	50	-	50
IV	22CAUJ02	SEC	Aptitude/Placement Training	Grade *	2	-	2	50	-	50*
IV	22CAUJ03	SEC	Online Course	-	1	-	-	-	-	C/N C≠
Total				26	26	10	-	450	300	750
Semester-IV										
III	22CAU17	DSC	Core-XIII: Relational Database Management System	5	5	-	3	50	50	100
	22CAU18		Track1Core -XIV							

III	22CAGU18	DSC	Track 2Core-XIV	5	5	-	3	50	50	100
III	22CAU19	DSC	Core-XV: Practical V: RDBMS Applications	3	-	5	3	50	50	100
III	22CAU20	DSC	Core-XVI: Practical VI: Software Testing Tools	3	-	5	3	50	50	100
III	22CAU21	GE	Allied-IV Business Accounting	4	5	-	3	50	50	100
III	22CAU22	DSE	Electives/DSE-I	4	4	-	3	50	50	100
III	22CAU23	SEC	Internship / Institutional Training/Mini-Project	1	-	-	-	100	-	100
IV	22CAUV03	ACC	VAC-III	1*	2	-	2	50	-	50**
IV	22CAUJ04	SEC	Aptitude/Placement Training	Grade*	2	-	2	50	-	50**
IV	22CAUJ05	SEC	Online Course	-	1	-	-	-	-	C/NC≠
IV	22GSU03	AECC	Internet Security	1	2	-	2	50	-	50
V	22GSU04	AECC	Extension Activities NSS/NCC/SPORTS/YRC/ SIS/SA#	2	-	-	-	-	-	C/NC≠
Total				28	26	10	-	450	300	750
Semester-V										
III	22CAU24	DSC	Core-XVII: .NET Programming	5	5	-	3	50	50	100
III	22CAU25	DSC	Core-XVIII : Mysql & PHP	5	5	-	3	50	50	100
III	22CAU26	DSC	Core-XIX: Practical VII: Programming using.NET	3	-	6	3	50	50	100
III	22CAU27	DSC	Track1: Core-XX: Practical-VIII	3	-	6	3	50	50	100
	22CAGU27		Track2: Core-XX: Practical-VIII							
III	22CAU28	DSE	Electives/DSE-II	4	5	-	3	50	50	100
IV	22CAUE03	AEE	Open Elective-III	2	3	-	3	100	-	100
IV	22GSU05	AECC	General Awareness	1	1	-	2	50	-	50
IV	22GSU06	AECC	Law of Ethics	1	-	-	2	50	-	50
IV	22CAUV04	ACC	VAC-IV	1*	2	-	-	50	-	50**
IV	22CAUJ06	SEC	Aptitude/Placement Training	Grade *	2	-	2	50	-	50**
IV	22CAUJ07	SEC	Online Course	-	1	-	-	-	-	C/NC≠
IV	22CAUJ08	SEC	SDR- Student Development Report	2*	-	-	-	-	-	-
Total				24	24	12	-	450	250	700
Semester-VI										

III	22CAU29	DSE	Electives/DSE-III	4	5	-	3	50	50	100
III	22CAU30	DSE	Electives/DSE-IV	4	5	-	3	50	50	100
III	22CAU31	DSC	Core-XXI: Self-Study Course	3	-	-	3	50	50	100
III	22CAU32	SEC	Project Work /Student Research / Paper	5	5	-	-	50	50	100
Total				16	15	-	-	200	200	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)
- Grade-Grades depends on the marks obtained
- [#]C-Completed/ NC- Not Completed

Range of Marks	Equivalent remarks
80 and above	Exemplary
70-79	Very good
60-69	Good
50-59	Fair
40-49	Satisfactory
Below 40	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% (Both Internal and External)

Abstract of Scheme of Examination

(For the students admitted during the academic year 2022 – 2023 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
	<i>Internship/Institutional Training/Mini-Project</i>	2	1	2	100	200
Part IV	Open Electives /AEE	3	2	6	100	300
	AECC EVs/HR/IS/GA/LE	5	1	5	50	250
	<i>Value Added Course</i>	2	1	2*	50	100**
	Placement/Aptitude SEC	4	Grade*	Grade*	50	200**
	On line Courses/SEC	3	-	-	-	C/NC
	Life Skills / SEC	2	1	2*	50	100**
	<i>SDR-Student Development Report</i>	1	2	2*	-	-
Part V	Extension Activities NSS / NCC/Sports/YRC / SIS / SA –AECC	1	-	2	-	C/NC
	Total			145 (6 Extra Credits)		4150 + (400**)

List of Open Elective Papers

Open Electives	Yoga for Human Excellence Human Health & Hygiene Indian Culture and Heritage Indian Constitution and Political System Consumer Awareness and Protection Professional Ethics and Human Values Human Rights, Women's Rights & Gender Equality
VAC Papers	Disaster Management Green Farming Corporate Relations start a Business? Research Methodology and IPR General Studies for Competitive Examinations IIT JAM Examination (for Science only) CUCET Examination
Courses offered by the Departments to other Programmes	Digital Marketing E Learning

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

Track 1


S. No	Subject Code	Subject Name
1.	22CAU02	Computer System Architecture
2.	22CAU06	Data Structures and Algorithms

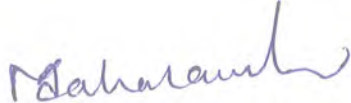
Track 2 (Industry Integrated Course – Google)

S. No	Subject Code	Subject Name
1.	22CAGU02	G Suite
2.	22CAGU06	Professional Collaboration Engineer

List of Elective Papers/ DSE (Can choose any one of the paper as electives)		
	Course Code	Title
Electives/ DSE-I	22CAU22A	Elective I: Software Testing (OR)
	22CAU22B	Elective I: Computer Installation Services
Electives/ DSE-II	22CAU28A	Elective II: Introduction to Compiler Design (OR)
	22CAU28B	Elective II: Information Security
Electives/ DSE-III	22CAU29A	Elective III: Cloud Computing(OR)
	22CAU29B	Elective III: Introduction to Machine Learning (OR)
	22CAU29C	Elective III: Network Security and Cryptography
Electives/ DSE-IV	22CAU30A	Elective IV: Internet of Things(OR)
	22CAU30B	Elective IV: Deep Learning (OR)
	22CAU30C	Elective IV: Computer Graphics


Syllabus Coordinator


BOS-Chairman/Chairperson


Academic Council – Member Secretary


PRINCIPAL
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Hindusthan College of Arts & Science (Autonomous),
Hindusthan Gardens, Behind Nava Indira,
Coimbatore - 641 028.

UG - Scheme of Evaluation (Internal & External Components)

(For the students admitted during the academic year 2022-2023 and onwards)

1. Internal Marks for all UG

Components	Marks
Test I	10
Test II	10
Model Exam	10
Assignment	5
Attendance*	5
Internal Assessment components **	10
TOTAL	50

*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

** List of components for Internal Assessment (MCQ Compulsory)

S.No	Components
1	Multiple choice questions
2	Club activities
3	Assignment
4	Seminar

(Any two components from the above list with five marks each will be calculated
.2x5=10 marks)

2. a) Components for Practical I.E.

Components	Marks
Test -I	15
Test - II	15
Observation	10
Application*	10
Total	50

b) Components for Practical E.E.

Components	Marks
Experiments/Exercise	40
Record	5
Viva	5
Total	50

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: a)Attendance	20	50
Report	50	50	b)Review/Work diary*	30	
Viva-voce	25	50			
Total	100	100	E.E** :a) Evaluation	30	50
			b)Viva-voce	20	
				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 $4 \times 5 = 20$ 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 $50 \times 1/2 = 25$ Marks]	50

6. Guidelines for open Elective (Part IV)

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

7. Value Added Courses and Aptitude/Placement courses:

Components	Marks
Two Test (each 1 hour) of 25 marks each QP is objective pattern ($25 \times 1 = 25$)	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 7 are to be treated as 100% Internal papers.
4. For item No.7, Tests conducted through online modules (Google Form/any other)
5. Item No.2: * - Application should be from the relevant practical subject other than the Listed programmes. It must be enclosed in the practical record.

UG PATTERN
QUESTION PAPER PATTERN FOR CIA I and CIA II EXAM

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

HINDUSTHAN COLLEGE OF ARTS & 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 6 = 24 marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

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

SECTION - C (2x10 = 20 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 & 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 Questions

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)

Blue Print of Question Paper for all UG Programmes

(For the academic year 2021-22, 2022-23)

FOR CIA I, CIA II - QUESTION PATTERN

Max. Marks: 50

Sec	Question No	Type	No of Question	Questions to be answered	Mark per question	K-level
A	1 to 6	MCQ/ True or False/ Fill up	6	6	1 (6x1=6)	All Questions will be K1
B	7 to 10	Either or Type (a or b)	8	4	6 (4x6=24)	4 Questions will be in K2 4 Questions will be in K3
C	11 to 13	Open choice	3	2	10 (2x10=20)	1 Question will be in K3 2 Question will be in K4

FOR MODEL/ESE - QUESTION PATTERN

Max. Marks:70

Sec	Question No	Type	No of Question	Questions to be answered	Mark per question	K-level
A	1 to 10	MCQ/ True or False/ Fill up	10	10	1 (10x1=10)	All Questions will be K1
B	11 to 15	Either or Type (a or b)	10	5	6 (5x6=30)	6 Questions will be in K2 4 Questions will be in K3
C	16 to 20	Open choice	5	3	10 (3x10=30)	2 Question will be in K3 3 Question will be in K4

(For the academic year 2020-21)

FOR CIA I, CIA II - QUESTION PATTERN

Max. Marks:50

Sec	Question No	Type	No of Question	Questions to be answered	Mark per question	K-level
A	1 to 6	MCQ/ True or False/ Fill up	6	6	1 (6x1=6)	All Questions will be K1
B	7 to 10	Either or Type (a or b)	8	4	5 (4x5=20)	4 Questions will be in K2 4 Questions will be in K3
C	11 to 13	Either or Type (a or b)	6	3	8 (3x8=24)	3 Question will be in K3 3 Question will be in K4

FOR MODEL/ESE - QUESTION PATTERN

Max. Marks:70

Sec	Question No	Type	No of Question	Questions to be answered	Mark per question	K-level
A	1 to 10	MCQ/ True or False/ Fill up	10	10	1 (10x1=10)	All Questions will be K1
B	11 to 15	Either or Type (a or b)	10	5	4 (5x4=20)	6 Questions will be in K2 4 Questions will be in K3
C	16 to 20	Either or Type (a or b)	10	5	8 (5x8=40)	5 Question will be in K3 5 Question will be in K4

Blue Print of Question Paper

Distribution of section-wise marks with K levels for UG 2021-22, 2022-23

CIA							
Sec.	K1	K2	K3	K4	Total questions	Questions to be answered	Total marks
A - MCQ/T or F / Fill up	6				6	6	6x1=6
B - Either or type		4	4		8	4	4x6=24
C - Open choice			1	2	3	2	2x10=20
Total Marks	6	24	34	20			84
% of marks without choice	7.14	28.57	40.48	23.81			100

Model Exam							
Sec.	K1	K2	K3	K4	Total questions	Questions to be answered	Total marks
A- MCQ/T or F/ Fill up	10				10	10	10x1=10
B - Either or type		6	4		10	5	5x6=30
C - Open choice			2	3	5	3	3x10=30
Total Marks	10	36	44	30			120
% of marks without choice	8.33	30	36.67	25			100

Distribution of section-wise marks with K levels for UG (2020-21)

CIA							
Sec.	K1	K2	K3	K4	Total questions	Questions to be answered	Total marks
A MCQ/T or F/ Fill up	6				6	6	6x1=6
B - Either or type		4	4		8	4	4x5=20
C - Either or type			3	3	6	3	3x8=24
Total Marks	6	20	54	24			104
% of marks without choice	5.77	19.23	51.92	23.08			100

Model Exam							
Sec.	K1	K2	K3	K4	Total questions	Questions to be answered	Total marks
A MCQ/True or False/ Fill up	10				10	10	10x1=10
B - Either or type		6	4		10	5	5x4=20
C - Either or type			5	5	10	5	5x8=40
Total Marks	10	24	56	40			130
% of marks without choice	7.69	18.46	43.08	30.77			100

UG Programme Regulations for the academic year 2022-2023

1. Internal marks components for the candidates admitted from the academic year 2022-2023 and onwards is as follows.

For Theory courses

Components	Marks
Test I	10
Test II	10
Model Exam	10
Assignment	5
Attendance	5
Internal Assessment components	10
TOTAL	50

For Practical courses

Components	Marks
Test –I	15
Test – II	15
Observation/Exercise	10
Application*	10
TOTAL	50

2. The pattern of the question paper for External Examination will be maximum of 70 marks for theory courses, the marks obtained will be converted into 50 as per the scheme.
3. Passing minimum for all UG programme is 40% in Internal and 40 % in External and the composition of total 40 marks out of 100 marks.
4. Internship / Institutional Training / Mini-Project is related to the discipline. The students can be permitted to complete the Internship / Institutional Training / Mini-Project before the end of First year (end of II semester) and before the end of the second year (end of IV semester) and submit a report.

Internship / Institutional Training	Duration: Not more than seven days
Mini project	During the course of study for not more than seven days.

5. Project work is considered as a special course involving application of knowledge in problem solving/analyzing/exploring a real-life situation. A Project work may be given in lieu of a discipline specific elective paper. Distribution of marks for major project for all UG programme will be 50:50 pattern for both Internal and External in total of 100/200 marks.
6. Two tests for fully internal subjects should be conducted during CIA-I and CIA –II by the department.
7. Retest for the failure candidates in CIA I or CIA II or Part IV or Part V or Extra credit courses should be conducted during the model examination after getting approval from the COE office. The candidates who are not able to complete the minimum pass mark in internal components even getting chance of reappearance, will be treated as arrear candidates.
8. For the Theory cum Practical blended courses, 50:50 Internal and External pattern will be followed for theory examination and Fully internal pattern will be followed for Practical examination. For theory part, External examination will be conducted as regular pattern (max of 70 marks) and it will be converted into 25 marks.

Course	Internal Marks		External marks		Total marks (Max. marks 50)	
	Min.	Max.	Min.	Max.	Min.	Max.
Theory	10	25	10	25	20	50
Practical	20	50	-		20	50

For Practical components for Theory cum Practical courses (Fully Internal)

Components	Marks
Test I	10
Test II	10
Experiment/Excercise	20
Record	5
Viva	5
Total	50

The Internal mark 50 will be converted into 25.

9. For the candidates admitted under the Fast Track System (FTS) must register their names to their concerned department heads and get approval from the COE office at the beginning of the III semester.
10. Students who are not willing to select the Project/Research work in Semester VI, can chose the theory papers offered by their departments as per the prescribed theory pattern.
11. Self Study will be a Core Paper of the department for which the examination pattern will be as like part III courses is followed.
12. 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.
13. SDR – Student Development Report to be received by the department from the students till end of the fifth semester. (Evidences of Curricular activities and Co-curricular activities)
14. For online courses minimum of 2 certificates in any of the online platform is mandatory.
15. Open elective courses:
Departments can offer list of subjects which teaches moral ethics to the young community for the better future. The topics relevant to Indian ethics, Culture, Women rights, Yoga, Green farming, Indian constitution etc., as an open elective courses. These courses can be offered by the department or other department as inter department courses. Marks earned for this courses will not be included for CGPA calculations.

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 /Kulangal Pathukappu Amaipu /Old age Home / Nature Foundation / etc.

Regulations of Fast Track System (FTS)

- From the academic year 2021-22, our college is offering Fast Track System (FTS) for all UG and PG programmes. In this system, we are offering two courses under the course type of Discipline Specific Elective (DSE) in the sixth semester for all UG programmes and fourth semester for all PG programmes, which are equivalent and related with **National Programme on Technology Enhanced Learning/Study Webs of Active-Learning for Young Aspiring Minds (NPTEL/SWAYAM)** courses.
- The students have the option of taking two subjects of the sixth semester of their programme through NPTEL/SWAYAM portal from the list given by NPTEL and can complete the online course before fifth semester and submit the received original certificates to the COE office for getting approval. If the student completes these courses before the beginning of the sixth semester (UG)/fourth semester (PG), the candidate can be considered and exempted to write the examination from the assigned DSE courses in the sixth semester/fourth semester. They should complete only the self study course and project work during the VI/IV semester as assigned in the scheme. The candidate who completes the online courses and submits the successful course completion credentials, the credit transfer will be considered as per our Scheme of Examination for qualifying the degree. **The minimum duration of the registered online course must be 12 weeks.** Course duration of less than 12 weeks will not be considered.
- For all PG programmes, the candidates who were admitted during the academic year 2021-2022 under the Fast track system, for the self study course, the internal mark component will be as follows. For others regular internal pattern follows.

TEST	Max. Marks	Mode
CIA I	50 (50x1=50)	Online objective type
Model Exam.	50 (50x1=50)	Online objective type

Out of these two tests, the total marks will be converted into 40 marks as Internal.

- For all UG programmes, the candidates who were admitted during the academic year 2021-2022 under the Fast track system, for the self study course, the internal mark component will be as follows. For others regular internal pattern follows.

TEST	Max. Marks	Mode
CIA I	50 (50x1=50)	Online objective type
CIA II	50 (50x1=50)	Online objective type
Model Exam.	50 (50x1=50)	Online objective type

Out of three tests, the total mark will be converted into 30 marks as Internal.

- For the students admitted in Fast Track System, must enroll their names to the concerned department heads and get approval from the COE office at the beginning of III semester for all UG Programmes and at the beginning of II semester for all PG programmes.
- The students who cleared and got certified for online courses under the fast track system, the grade obtained will be converted into average marks of range. The received certificates must be submitted to the COE office for approval of the Controller and the Principal. The FTS courses will be treated as fully external.

Scheme of Evaluation – Track2 (Industry Oriented)

- a. It is resolved that changes are recommended in the existing scheme of evaluation for the **Track 2: Industry Oriented (Mobile App Development with Google Technologies)** students from the academic year 2022-2023 and onwards.

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

1. 50-50 Pattern Policy:

a. 50 Marks Internals

- i. **MCQ -30 Marks**
- ii. **Analytical Pattern – 15 Marks**
- iii. **Class Attendance – 5 Marks**
(Above 95% to 100% = 5 marks
Above 90% to 95% = 4 marks
Above 85% to 90% = 3 marks
Above 80% to 85% = 2 marks
Above 75% to 80% = 1 marks
Below 75% = 0 mark)

b. Continuous Assessment Test:

- i. Tests will be conducted under 50 marks Pattern
- ii. MCQ = 30(15*2= 30 Marks)
- iii. Analytical Pattern = 20 (20*1= 20 Marks)

2. 50 Marks Externals

- Online Exam with objective Pattern will be conducted for MCQ = 40 Marks & Analytical Pattern = 10 Marks

For Semester – II only MCQ Type Questions will be followed

1. 50-50 Pattern Policy:

a. 50 Marks Internals

- i. **MCQ -30 marks**
- ii. **Practical session - 15**
- iii. **Class Attendance – 5 Marks**
(Above 95% to 100% = 5 marks
Above 90% to 95% = 4 marks
Above 85% to 90% = 3 marks
Above 80% to 85% = 2 marks
Above 75% to 80% = 1 marks
Below 75% = 0 mark)

b. Continuous Assessment Test:

- i. Tests will be conducted under 50 marks Pattern
- ii. MCQ=25 (25*2=50 Marks)

2. 50 Marks Externals

- Online Exam with objective Pattern will be conducted for MCQ = 50(50*1=50 Marks)

3. Final Exam (Global Certification Exam)

- a. The pattern that follows exactly Google Certification Exam pattern.
- b. Online Exam will be conducted with MCQ and Analytical pattern.
- c. 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.
- d. If not, Candidate can reappear for the examination conducted by industry experts.
 - The minimum passing should be 40%.
- e. Global Certification will be issued as whether the candidate is Certified or Not.
- f. The certification expires after 2 years and students will need to get re-certified to maintain their certification status after 2 years.

DEPARTMENT OF COMPUTER APPLICATIONS				CLASS: I BCA				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours / Week	CIA	Ext	Total
I	DSC	22CAU01	Programming with C	4	4	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	
	Entrepreneurship Oriented	
	Skill Development	✓

Course Objectives			
<ul style="list-style-type: none"> The course is oriented to those who want to advance structured and procedural programming Understanding and improving C programming skills. The major objective is to provide students with an understanding of code organization and functional hierarchical decomposition by using complex data types. Students will be able to develop logics that will help them to create programs, and applications in C. To practice the fundamental programming methodology via lab program experiences. 			
Unit	Course Contents	Hours	K Level
I	Overview of C: History of C – Importance of C – Basic Structure of C – Programming style. Introduction to C: Introduction –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.	10	UPTO K4
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-String function.	10	UPTO K4
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	10	UPTO K4

	Functions.		
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	UPTO K4
V	Dynamic Memory Allocation and Linked List: Introduction- Allocating a block of memory-Multiple blocks 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	UPTO K4

Note: The Questions should be asked in the ratio of 20% Programs and 80% for theory

Book for Study

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

Books for Reference

1. E.Balaguruswami, " Programming in ANSI C", TMH 21st reprint 1998
2. Y.Kanetkar, "Let us C", BPB Publications, 15th Edition 2017 revised.
3. Brian W Kwenighan, Dennis M.Ritchie, "The C Programming Language",
Prentice-Hall Software Series 2nd Edition
4. K N King, " C Programming A modern Approach", Second Edition.
5. Ashok N. Kamathane, "Computer Programming", IITL Education Solutions Limited

Web Resources

1. <https://www.tutorialspoint.com/cprogramming/index.html>
2. <https://www.geeksforgeeks.org/c-language-set-1-introduction/>

Pedagogy: Chalk & Talk, Exercise, Assignments & PPTs.

The rationale for Nature of the Course: Can be professionals in programming and logical solving skills.

Activities to be given

1. Logical thinking for complex problems.
2. Prepare concept-wise programs to develop programming skills.
3. Preparing the students for technical Exercises and programs to attend and clear interview rounds

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CLO1	Illustrate and Experiment the fundamental concept of C	UPTO K4
CLO2	Select the suitable loops and decision making statements to solve problems	UPTO K4
CLO3	Analyze the concepts of arrays and string handling function	UPTO K4
CLO4	Differentiate structures and unions	UPTO K4
CLO5	Explain the concepts of Pointers and Files	UPTO K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7
CLO 1	3	3	2	2	2	3	3
CLO 2	3	2	3	2	2	2	3
CLO 3	3	2	2	2	2	1	3
CLO 4	3	2	2	2	3	3	3
CLO 5	3	3	3	2	3	2	3

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
Mr.Karthi M	Dr.P.Senthil Vadivu	

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

DEPARTMENT OF COMPUTER APPLICATIONS				CLASS: I BCA				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours / Week	CIA	Ext	Total
I	DSC	22CAU02	Computer System Architecture	4	4	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	
	Skill Development	✓

Course Objectives

- 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, I/O and Memory.
- Inculcate knowledge on multiprocessor concepts

Unit	Course Contents	Hours	K Level
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 T Flip Fop.	9	UPTO K4
II	Digital Components: Integrated Circuits- Decoders- NAND Gate Decoder- Decoder Expansion- Encoders- Multiplexers- Memory Unit- Random-Access Memory -Read-Only Memory- Types of ROMs.	10	UPTO K4

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	UPTO K4
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	UPTO K4
V	Memory Organization: Memory Sub System- Memory hierarchy – Main memory - Auxiliary memory - Flash memory - Associative memory – Cache memory - Virtual memory. Multiprocessors: Characteristics- Intel-processor Arbitration- Interprocessor Communication and Synchronization- Cache Coherence Self Study 5 Intel 8086 Microprocessor.	9	UPTO K4

Note: The Questions should be asked in the ratio of 10% Problems and 90% for theory

Book for Study

1. LM. Morris Mano, “*Computer System and Architecture*”, Pearson Education, Third Edition, (30 June 2017).

Books for Reference

1. Badri Ram, “*Advanced Microprocessors and Interfacing*”, TMH, 2012.
2. W. Stallings, “*Computer Organization & Architecture*”, Pearson Education, 8th Edition -2012.
3. M. Carter, “*Computer Architecture*”, Schaum's outline series, TMH, Special Indian Edition.
4. P.V.S Rao, “*Computer System Architecture*”, PHI Learning Private Ltd, New Delhi, 2009.
5. Aharon Yadin, “*Computer Systems Architecture*”, 2020 by Chapman and Hall/CRC.

Web Resources

1. <https://www.javatpoint.com/computer-organization-and-architecture-tutorial>
2. <https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/>

Pedagogy: PowerPoint Projection through LCD, Assignment, Discussion and Activity.

Rationale for Nature of the Course: Can be professional in analyzing the architecture and organization of Digital computers.

Activities to be given

1. Number system conversion exercises.
2. Seminar on Digital components of a computer
3. Demonstrating Central Processing Unit using PPT

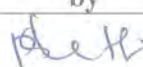


Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CLO1	Illustrate various data representation and logic circuits in a Computer.	UPTO K4
CLO2	Infer the concepts of Digital Components of a computer.	UPTO K4
CLO3	Illustrate the concepts of multiprocessor.	UPTO K4
CLO4	Explain the internal components of combinational circuits, CPU, I/O and Memory.	UPTO K4
CLO5	Analyze the design of Logic Circuits, CPU, and Memory	UPTO K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CLO1	1	3	3	2	1	2	3
CLO2	3	3	3	2	2	2	3
CLO3	3	3	3	1	2	2	3
CLO4	3	3	3	3	2	2	3
CLO5	3	3	3	3	2	3	3

3 – Advance Application 2 – Intermediate Level 1 – Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Mrs. P. Shanthi	 Dr. P. Senthil Vadivu	

Coordinator
Department Cell
Department of Science,
B. J. Somaiya Institute of Technology

DEPARTMENT OF COMPUTER APPLICATIONS				CLASS: I BCA				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours /Week	CIA	Ext	Total
I	DSC	22CAGU02	G SUITE	4	4	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	✓
	Skill Development	✓

Course Objectives

- To be familiar with Drive, Gmail, Hangouts Meet.
- To be familiar with Docs, Sheets, Forms, Slides.
- Students will be ready to take the Google G Suite certification.
- Industry oriented course
- To be familiar with latest Trends in G Suite.

Unit	Course Contents	Hours	K Level
I	Managing files in Drive - Creating and managing folders in Drive - Locating files - Sharing files and folders.	10	UPTO K4
II	Personalizing settings in G Mail - Managing G Mail Inbox - Managing and communicating with Contacts - Locating Messages - Using G Mail offline.	10	UPTO K4
III	Scheduling a Hangout- Working and collaborating in Docs	10	UPTO K4
IV	Working in Sheets and Forms	9	UPTO K4
V	Working in Slides	9	UPTO K4

Note: The Questions should be asked in the ratio of 10% Problems and 90% for theory

Book for Study

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

Books for Reference

NA

Web Resources

<https://support.google.com/a/users/answer/9296686>

Pedagogy: Power Point Projection through LCD, Assignment, Discussion and Activity.

Rationale for Nature of the Course: Can be professional G Suite Applications.

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K-Level
CLO1	Illustrate and to Create, manage folders in Drive.	UPTOK4
CLO2	Infer the concepts Personalizing settings in G Mail.	UPTOK4
CLO3	Illustrate the concepts of Scheduling a Hangout.	UPTOK4
CLO4	Explain the Sheets and Forms.	UPTO K4
CLO5	Analyze the design of Slides.	UPTO K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes(POs)

CLOs	Programme Outcomes(with Graduate Attributes)						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CLO1	1	3	3	2	1	2	3
CLO2	3	3	3	2	2	2	3
CLO3	3	3	3	1	2	2	3
CLO4	3	3	3	3	2	2	3
CLO5	3	3	3	3	2	3	3

3-Advance Application

2- Intermediate Level

1 -Basic Level

Course Designed by	Verified by	Approved by CDC Co-ordinator
<p><i>D. Senthil Vadivu</i></p>	<p><i>[Signature]</i> HOB</p>	<p><i>[Signature]</i></p>

Dr.P.Senthil Vadivu
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.

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

DEPARTMENT OF COMPUTER APPLICATIONS				CLASS: I BCA				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours / Week	CIA	Ext	Total
I	DSC	22CAU03	Practical I: Programming Using C	2	4	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	
	Entrepreneurship Oriented	
	Skill Development	✓

Course Objectives

- The course is oriented to those who want to advance structured and procedural programming
- Understanding and improving C programming skills.
- The major objective is to provide students with an understanding of code organization and functional hierarchical decomposition by using complex data types
- Students will be able to develop logics that will help them to create programs and applications in C.
- To practice the fundamental programming methodology via lab program experiences.

22CAU03	PRACTICAL I: Programming Using C	Hours	K-Level
1	Program to develop a Simple Calculator using a switch case.	4	UPTO K4
2	Program for Nested loop.	4	UPTO K4
3	Program to sort numbers in ascending and descending order using Arrays...	4	UPTO K4
4	Program to accept two numbers from user and swap the values using call by reference method	4	UPTO K4
5	Program to find the Prime numbers between two integers using functions	4	UPTO K4
6	Program to Multiply two Matrices by Passing Matrix to a Function	4	UPTO K4
7	Program to generating Fibonacci Numbers using recursive functions	4	UPTO K4

8	Program for String manipulations without using string functions (string length, string comparison, string copy) (Using function pointers).	4	UPTO K4
9	Program using Function Pointers.	4	UPTO K4
10	Program to Find Largest Number Using Dynamic Memory Allocation	4	UPTO K4
11	Program to read and write a file line by line.	4	UPTO K4
12	Program to know the working of linked list.	4	UPTO K4

Note: The Questions should be asked in the ratio of 100% Programs

Activities to be given

1. Logical thinking for complex programs
2. Prepare concept-wise programs to develop programming skills.
3. Preparing the students for technical Exercises and programs to attend and clear interview rounds.
4. To create and understand the programming concepts and methods used to develop a program.

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CLO1	Illustrate the fundamentals of C programming	UPTO K4
CLO2	Select the suitable loops and decision making statements to solve problems	UPTO K4
CLO3	Analyze the concepts of arrays and string handling function	UPTO K4
CLO4	Differentiate structures and unions	UPTO K4
CLO5	Experiment the concepts of Pointers, Files, command line, and linked list	UPTO K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7
CLO 1	3	3	3	3	2	3	3
CLO 2	3	3	3	2	3	2	3
CLO 3	3	3	3	3	2	3	3
CLO 4	3	3	3	3	3	3	3
CLO 5	3	3	3	2	2	3	3

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
Mr.Karthi M	Dr.P.Senthil Vadivu	

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

DEPARTMENT OF COMPUTER APPLICATIONS				CLASS: I BCA				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours / Week	CIA	Ext	Total
II	DSC	22CAU05	Python Programming	4	4	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	
	Skill Development	✓

Course Objectives

- To describe the fundamental elements of Python programming basics and paradigm.
- To discover the knowledge on functions and pass arguments in Python.
- To relate about list, dictionaries, tuples and files.
- Solve the problems using String Concepts.
- Interpret the concepts of object oriented programs with Python classes.

Unit	Course Contents	Hours	K Level
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. Character Sets. Expressions.	10	UPTO K4
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. Conditional Iteration: The while Loop, The Structure and Behavior of a while Loop, Count Control with a while Loop, The <i>while True Loop</i> and the <i>break</i> Statement.	10	UPTO K4
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: 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.	10	UPTO K4

IV	String and Text Files: 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 its 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	UPTO K4
V	Design with Classes: Objects and Classes: Method Definitions <code>_init_</code> and <code>_str_</code> , Accessors and Mutators. Data Modeling: Comparison Methods, Equality and <code>_equ_</code> method. Structuring Classes with Inheritance and Polymorphism: Inheritance Hierarchies and Modeling, Polymorphic Methods. Case Study	8	UPTO K4

Note: The Questions should be asked in the ratio of 100% for Theory

Book for Study

1. Kenneth A. Lambert, Fundamentals of Python: First Programs, Second Edition, Cengage Learning, 2019 .
2. Books for Reference
3. Updated for Python 3, Shroff/O'Reilly Publishers, 2016
- 4.
5. Allen Downey, Jeffrey Elkner, Chris Meyers. How to think like a computer scientist learning with Python / 1st Edition, 2012.
6. Dr.K.Selvamani, Dr.K.Kulothungan, Dr.E.Anbalagam, Dr. R.Ramesh Problem, solving and Python Programming, Sri Maruthi Publishers, 2019.
7. Timothy A. Budd , Exploring Python, 12th Edition, McGraw Hill , 2010.
8. Martin C. Brown, Python Complete Reference, TMH, 2018.

Web Resources

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

Pedagogy: Chalk & Talk, Exercise, Assignments & PPTs.

Rationale for Nature of the Course: Python's clean object-oriented design provides enhanced process control, and the language is equipped with excellent text processing and integration capabilities.

Activities to be given

1. Seminar on Functions & Modules
2. Seminar on Classes & Objects with PPT (Case Study):

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CO1	Describe the Syntax and semantics of Python Programming Languages.	Upto K4
CO2	Observe the fundamental principles of Object-Oriented Programming	Upto K4
CO3	Discuss the programming concepts to solve real world problems using Functions and Modules.	Upto K4
CO4	Experiment with structuring the data using Lists, Dictionaries, and Tuples.	Upto K4
CO5	Applying File Concepts to read and write data operations.	Upto K4

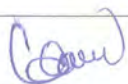


Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CLO 1	3	3	3	3	2	3	3
CLO 2	3	2	3	3	3	3	3
CLO 3	3	3	3	3	3	3	3
CLO 4	3	2	3	1	1	2	3
CLO 5	3	3	3	3	3	3	3

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Mr.S.Aravind	 Dr.P. Senthil Vadivu	

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

DEPARTMENT OF COMPUTER APPLICATIONS				CLASS: I BCA				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours / Week	CIA	Ext	Total
II	DSC	22CAU06	Data Structures and Algorithms	4	4	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	
	Entrepreneurship Oriented	
	Skill Development	
		√

Course Objectives			
<ul style="list-style-type: none"> • To impart the basic concepts of data structures and algorithms. • To understand and remember algorithms and its analysis procedure. • To inculcate knowledge on stacks, queues, lists, trees and graphs. • To learn concepts of searching and sorting techniques. • To provide the knowledge of hashing techniques. 			
Unit	Course Contents	Hours	K Level
I	Introduction to Algorithms: What is an algorithm –Why the analysis of algorithm-Goal of the analysis of algorithm – How to compare algorithm- Algorithms Design Techniques: Classification- Classification by Implementation and design method.	10	Upto K4
II	Arrays - Stacks and Queues - Fundamentals. Linked List: -Singly Linked List - Doubly linked list –Circular Linked List- Polynomial addition.	10	Upto K4
III	Trees: Binary tree representations – Binary Tree Traversal – Threaded Binary Trees –Binary search trees. Graphs: - Applications of Graphs- Traversals, Connected Components.	10	Upto K4
IV	Searching and Sorting: Searching: Linear search, Binary search and Hashing. Algorithms and data structures for sorting: Insertion Sort, Bubble sort, Selection Sort, Merge sort, Quick Sort, Heap Sort, Shell Sort, Tree Sort-Radix Sort-Topological Sort-External Sorting.	10	Upto K4
V	Hashing: Components of Hashing-Hash tables -Hashing Functions- Collision Resolution Techniques.	8	Upto K4

Note: The Questions should be asked in the ratio of 100% for Theory

Book for Study

1. *Narasimha Karumanchi "Data Structures and algorithms made easy", 5th Edition, CareerMonk Publications, 2017.*

Books for Reference

1. *Mark Allen Weiss, " Data Structure and Algorithm analysis", Pearson Education, Second Edition, Sixteenth Impression 2014.*
2. *Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, Data Structures and Algorithms, Pearson Education, New Delhi, 2006.*
3. *E. Balagurusamy, "Data Structures Using C", Tata McGraw Hill, 2013.*
4. *Samanta.D , Classic Data Structure Prentice Hall of India Pvt Ltd 2007, 9th Edition*
5. *Seymour Lipchitz, Data Structures McGraw Hill Publications, 2014, 1st Edition*

Web Resources

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

Pedagogy: Chalk & Talk, Exercise, Assignments & PPTs.

Rationale for Nature of the Course: Can be professionals in solving advanced problems to pursue higher studies.

Activities to be given

1. Seminar on Threaded Binary Trees.
2. Seminar on Algorithms and data structures of sorting using PPT.

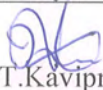

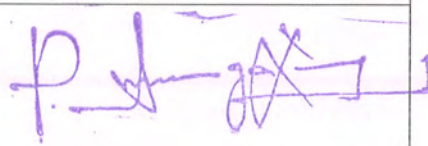
Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CO1	Examine Data Structures and Algorithms appropriately to solve a variety of computational problems.	UPTO K4
CO2	List the Linear and Non-Linear data structures like Stacks, Queues and, Linked List.	UPTO K4
CO3	Categorize Trees and Graph concepts.	UPTO K4
CO4	Classify the concept of searching and sorting techniques.	UPTO K4
CO5	Analyze the knowledge of Hashing and its techniques.	UPTO K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CLO 1	3	3	3	3	3	3	3
CLO 2	3	2	2	2	1	2	3
CLO 3	3	2	3	2	1	2	3
CLO 4	3	2	3	1	1	1	3
CLO 5	1	2	2	2	2	2	3

3-Advance Application 2 – Intermediate Level 1 – Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Dr.T.Kavipriya	 Dr.P.Senthil Vadivu	

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

DEPARTMENT OF COMPUTER APPLICATIONS				CLASS: I BCA				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours /Week	CIA	Ext	Total
I	DSC	22CAGU06	Professional Collaboration Engineer	4	4	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	✓
	Skill Development	✓

Course Objectives

- To be familiar with managing the G Suite Administrator Console.
- To be able to manage various Apps in the organization domain.
- To configure the organizational aspects.
- To be effective with admin controls.
- Students will be ready to take certification.

Unit	Course Contents	Hours	K Level
I	Planning and Implementing G Suite authorization and access	10	UPTO K4
II	Managing user, resource, and Team Drive lifecycles	9	UPTO K4
III	Managing mail, Controlling and configuring G Suite services	9	UPTO K4
IV	Configuring and managing content access Configuring and managing endpoint access	10	UPTO K4
V	Monitoring organizational operations, Advancing G Suite adoption and collaboration	10	UPTO K4

Note: The Questions should be asked in the ratio of 10% Problems and 90% for theory

Book for Study

No text book required. Students will use their college PCE for Education ID as a learning tool. Online material is available - <https://support.google.com/a/?hl=en#topic=4388346>

Books for Reference

NA

Web Resources

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

Pedagogy: Power Point Projection through LCD, Assignment, Discussion and Activity.

Rationale for Nature of the Course: Can be professional PCE Applications.

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K-Level
CLO1	Illustrate and to Create, manage folders in Drive.	UPTOK4
CLO2	Infer the concepts Personalizing settings in G Mail.	UPTOK4
CLO3	Illustrate the concepts of Scheduling a Hangout.	UPTOK4
CLO4	Explain the Sheets and Forms.	UPTOK4
CLO5	Compare and Contrast G Suite and PCE.	UPTOK4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

CLOs	Programme Outcomes (with Graduate Attributes)						PO7
	PO1	PO2	PO3	PO4	PO5	PO6	
CLO1	1	3	3	2	1	2	3
CLO2	3	3	3	2	2	2	3
CLO3	3	3	3	1	2	2	3
CLO4	3	3	3	3	2	2	3
CLO5	3	3	3	3	2	3	3

3–Advance Application

2– Intermediate Level

1 –Basic Level

Course Designed by	Verified by	Approved by CDC Co-ordinator
<p><i>Senthil Vadivu</i></p>	<p><i>[Signature]</i> HOD</p>	<p><i>[Signature]</i></p>

Dr.P.Senthil Vadivu
Dr. P. SENTHIL VADIVU,
 M.Sc., M.Phil., Ph.D.,
 Head & Associate Professor
 Dept. of Computer Applications
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 Curriculum Development Cell
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 Coimbatore - 641 028.

DEPARTMENT OF COMPUTER APPLICATIONS				CLASS: I BCA				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours / Week	CIA	Ext	Total
II	DSC	22CAU07	Programming using Python	2	4	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	
	Skill Development	✓

Course Objectives			
<ul style="list-style-type: none"> Understate and debug Python Programs. Apply Branching and looping concepts in Python Programs. Analyze and apply Data structure concepts using python programming. Develop applications using Object oriented Programming. Develop application for Bio computing 			
S. No	Course Contents	Hours	K-Level
1	Program to find first n prime numbers.	6	UPTO K4
2	Program to find the exponentiation of a number.	4	UPTO K4
3	Program to perform Binary Search.	4	UPTO K4
4	Program to implement Linear Search.	5	UPTO K4
5	Program to perform Classes and methods	5	UPTO K4
6	Program to perform polymorphism	5	UPTO K4
7	Program to perform Inheritance	5	UPTO K4
8	Program to perform Encapsulation	5	UPTO K4
9	Gene Sequence mining using Python.	5	UPTO K4
10	Bio computing in Python.	4	UPTO K4

Note: The Questions should be asked in the ratio of 100% Programs

Pedagogy: LCD, Exercise, Assignments & PPTs.

Rationale for Nature of the Course: Can be professionals in solving advanced problems to pursue higher studies.

Activities to be given

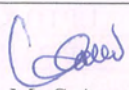
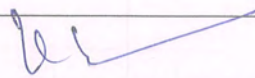
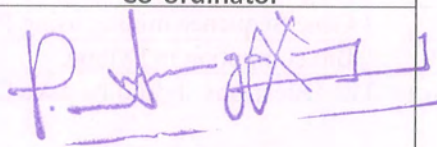
Case Study on Classes & Objects

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CLO1	Understate and debug Python Programs.	Upto K4
CLO2	Apply Branching and looping concepts in Python Programs.	Upto K4
CLO3	Analyze and apply Data structure concepts using python programming.	Upto K4
CLO4	Develop applications using Object oriented Programming.	Upto K4
CLO5	Develop application for Bio computing	Upto K4

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CLO 1	3	2	2	2	2	2	2
CLO 2	2	1	1	1	2	2	3
CLO 3	3	2	3	3	2	2	2
CLO 4	3	3	3	3	2	3	3
CLO 5	3	2	2	3	2	3	2

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Mr.S.Aravind	 Dr.P. Senthil Vadivu	

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

DEPARTMENT OF COMPUTER APPLICATIONS				CLASS: I BCA				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours / Week	CIA	Ext	Total
II	DSC	22CAU08	Multimedia Systems	3	3	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	√
	Entrepreneurship Oriented	
	Skill Development	√

Course Objectives			
<ul style="list-style-type: none"> • Effective learning about Multimedia hardware and software components. • Apply the knowledge of the basic fundamental's components of Multimedia. • To apply the animatic effects for basic multimedia formats. • To inculcate knowledge on multimedia authoring tools, planning and costing. • To provide the knowledge of multimedia project designing, producing and delivering. 			
Unit	Course Contents	Hours	K Level
I	Getting Started with Multimedia Systems: what is Multimedia: Definitions - where to use multimedia Introduction to Making Multimedia: The stages of a Multimedia project - What You Need Hardware: Windows and Macintosh – Connections - Memory and storage Devices - Input Devices - Output Devices. What You Need Software: Text Editing and Word Processing Tools - OCR Software-Painting and Drawing Tools - 3-D Modeling and Animation Tools – ImageEditing Tools - Sound Editing Tools - Animation, Video and Digital Movies Tools - Helpful Accessories.	7	UPTO K4
II	Text: The Power of Meaning – About Fonts and Faces –Using Text in Multimedia – Computers and Text – Font Editing and Design Tools – Hypermedia and Hypertext- Sound: The Power of Sound – Multimedia System Sounds- MIDI Versus Digital Audio – Digital Audio – Making MIDI Audio – Audio	7	UPTO K4

	file formats - Adding Sound to your multimedia project.		
III	Images: Making Still Images – color- Image File formats. Animation: The Power of motion – Principles of Animation - Making Animation That Work Video: Using video – How video works – Broadcast Video Standards – Integrating Computers and Television – shooting and Editing Video – Video Tips – Recording Formats – Digital video.	7	UPTO K4
IV	Multimedia Authoring Tools: Types of Authoring Tools – Card and page Based Authoring Tools, Icon and Object Based Authoring Tools, Time Based Authoring Tools – Objects, Choosing an Authoring Tools Planning and Costing: Process of Making Multimedia: Idea Analysis, Pretesting, Task Planning, Prototype development, Alpha development, Beta Development Delivery RFPs and Bid Proposals.	7	UPTO K4
V	Designing and Producing: Designing – Producing – Content and Talent: Acquiring Content – Using content created by others – Using Contents created for a project – Using Talent – Delivering: Testing – preparing for Delivery – Delivering on CD-ROM – Compact Disc Technology – Wrapping It Up – Delivering on the World Wide Web.	8	UPTO K4

Note: The Questions should be asked in the ratio of 100% for Theory

Book for Study

1. Tay Vaughan, "Multimedia: Making it work – Eighth Edition", Tata McGraw Hill Edition, 2011.

Books for Reference

1. Walter worth john A, "Multimedia Technologies and Application", Ellis Horwood Ltd London, 1991.
2. John F koegel Buford, "Multimedia Systems", Pearson edition, 2003.
3. Ranjan Parekh, "Principles of Multimedia", TMH, 2006.
4. Ralf Steinmetz and KlaraNahrstedt, "Multimedia: Computing, Communication and applications", Pearson Edition, 2001.
5. Sugata Mitra, Gaurav Bhatnagar, Shikha Mehta, " Introduction to Multimedia Systems", Academic Press, 2002.

Web Resources

https://users.dimi.uniud.it/~antonio.dangelo/MMS/materials/Fundamentals_of_Multimedia.pdf.

<https://www.coursera.org/learn/planning-auditing-maintaining-enterprise-systems>.

Pedagogy: Chalk & Talk, Exercise, Assignments & PPTs.

Rationale for Nature of the Course: Can be creative professionals in development of animation multimedia techniques.

Activities to be given

1. Seminar on Digital Image Processing with Matlab
2. Hands on Training for the usage of recent multimedia tools.

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CO1	Define Multimedia, uses, hardware and software components appropriately to create a graphical application.	Upto K4
CO2	Analyze Text and Sound effects components of multimedia.	Upto K4
CO3	Illustrate Image, video and animation effects for making graphical animation.	Upto K4
CO4	Demonstrate the concept of authoring tools, planning and costing of applications.	Upto K4
CO5	Identify the knowledge of Designing, Producing and delivering the project.	Upto K4

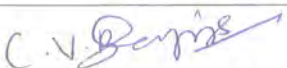
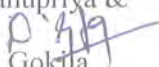


Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CLO 1	3	2	2	3	2	3	3
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CLO 4	3	3	2	2	2	2	3
CLO 5	3	3	3	3	3	3	3

3 – Advance Application

2 – Intermediate Level

1 – Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Dr.C.V. Banupriya &  Mrs. D. Gokila	 Dr.P. Senthil Vadivu	

Co-ordinator
 Curricula Development Cell
 Hindusthan College of Arts & Science,
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