LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK (LOCF)

in the

UNDERGRADUATE PROGRAMME

BACHELOR OF SCIENCE

ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

FOR THE STUDENTS ADMITTED FROM

THE ACADEMIC YEAR 2022 - 2023 AND

ONWARDS

HICAS

HINDUSTHAN COLLEGE OF ARTS AND SCIENCE

(AUTONOMOUS)

(Affiliated to Bharathiar University and Accredited by NAAC) COIMBATORE-641028
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PREAMBLE

Bachelor of Science in Computer Science with Artificial Intelligence & Machine Learning is a three years programme spanning six semesters. Intelligent machines have substituted human competencies in diverse areas. Artificial intelligence is the intelligence unveiled by machines or software. It is the branch of computer science that emphasizes on creating intelligent machines that work and react like humans. This course is designed meticulously to fine tune Graduate research attributes and inculcate research interest amongthe students to pursue higher education or to get expertise in domain for employment. It also provides the scope for startup innovations in the domain.

VISION

To instigate the state-of-the-art technological trends and to cope up with the global challenges, this course provides a foundation. To understand the nuances of the deep machine learning scenario and to get insights of environmental and ethical values, this course provides a holistic approach.

MISSION

The Mission of the course is to pursue a philosophy of subsequent acquisition of knowledge in artificial intelligence and machine learning. The significant aspect is toprovide value-based education and to bring out the hidden potentials in students that equip them to approach life with optimism.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The B.Sc. Computer Science with Artificial Intelligence & Machine Learning programme describe accomplishments that graduates are expected to attain:

PEO1: Expertise the principle of Artificial Intelligence and problem solving, inference,perception, knowledge representation, and learning

PEO 2: Exhibit high standards with regard to application of AI techniques in intelligentagents and expert systems

PEO 3: Instigate the nuances of artificial neural networks and machine learning models

PEO 4: Explore the scope, potential, limitations, and implications of intelligent systems.

PEO 5: Investigate with a machine learning model for simulation and analysis of the vastvolume of data to get inferences

PROGRAMME OUTCOME (PO)

PO1: DISCIPLINARY KNOWLEDGE: Get inquisition of the nuances of the artificial neural systems, fuzzy systems and machine learning aspects

PO2: PROBLEM SOLVING AND ANALYZING: Enumerate and deploy the technical and critical thinking skills in the discipline of artificial intelligence and machine learning to find solutions for complex problems.

PO3: ENVIRONMENT SUSTAINABILITY AND ETHICS: Intend to develop research-based solutions for complex problems in artificial intelligence and machine learning industry through appropriate consideration for the public health, safety, cultural, societal, environmental and ethical concerns.

PO4: MODERN TOOL USAGE: Indulge in sustainable computing practice to cope up state of the art tools in the pace of dynamic technological changes

PO5: CO-OPERATIVE TEAM WORK & COMMUNICATIVE SKILLS: Establish the ability to listen, read, proficiently communicate and articulate complex
ideas with respect to the needs and abilities of diverse audiences.

PO6: SELF-DIRECTED AND LIFE-LONG LEARNING: Instill the compatibility to work in diverse environment and understand empathically the stakeholder's perspectives to possess the lifelong learning significance

PO7: ENHANCING RESEARCH CULTURE: Design and develop research based solutions for complex problems with specified needs through appropriate consideration for the public health, safety, cultural, societal and environmental concerns. Inculcate the graduate research attributes to bring out the unique working models, through the subsequent deployment stages,

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1: Exemplify good domain knowledge and completes the assigned responsibilities effectively and efficiently in par with the expected quality standards in Artificial Intelligence

PSO2: Deploy analytical and critical thinking to identify, formulate, analyze, and solve complex problems in order to reach authenticated conclusions using Machine Learning

PSO3: Ascertain the ability to listen, read, proficiently communicate and articulate complex ideas with respect to the needs and abilities of diverse audiences.

PSO4: Inhibit innovative ideas to instigate new business ventures and possess the qualities of a good entrepreneur

PSO5: Function as socially responsible individual with ethical values and accountable to ethically validate any actions or decisions before proceeding and actively contribute to the societal concerns.

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: B.Sc. **Branch: Artificial Intelligence & Machine Learning**

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	22AIU01	DSC	**Core-I** Object Oriented Programming in C++	4	4		3	50	50	100
III	22AIU02	DSC	**Core-II** Data structures and Algorithm	4	4		3	50	50	100
III	22AIU03	DSC	**Core-III Practical- I** Programming using C++	2		4	3	50	50	100
III	22AIU04	GE	**Allied-I** /GE I Mathematics for Computing	4	5		3	50	50	100
IV	22GSU01	AECC	Environmental Studies	1	2		2	50	-	50
IV	22 AIUV01	SEC	Life Skills-I @ / **SEC-** Communicative English	1*	2		2	50	-	50**
IV	22AIUE01	AEE	Open Elective - I	2	3		3	100	-	100
IV	-	SEC	**SDR- Student 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		**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	22AIU05	DSC	**Core -IV** Java Programming	4	4		3	50	50	100
III	22AIU06	DSC	**Core -V Practical- II** Programming using Java	2		4	3	50	50	100
III	22AIU07	DSC	**Core -VI Practical- III** Internet Basics	2		3	3	50	50	100
III	22AIU08	DSC	**Core -VII** Fundamentals of Artificial Intelligence and Robotics	4	4		3	50	50	100
III	22AIU09	GE	**Allied-II**/GE II Numerical Methods	4	5		3	50	50	100
III	22AIU10	SEC	Internship / Industrial Visit / **Mini Project**	1	-	-		100		100
IV	22AIUV02	SEC	Life Skills-II @ **SEC – Language**	1*	2		2	50	-	50**
IV	22AIUJ01	SEC	**Aptitude / Placement Training**	Grade*	2		2	50		50**
Total				**25**	**29**	7		**450**	**350**	**800**

Semester – III										
III	22AIU11	DSC	**Core – VIII** Python Programming	5	5		3	50	50	100
III	22AIU12	DSC	**Core-IX** Internet of Things	5	5		3	50	50	100
III	22AIU13	DSC	**Core -X Practical – IV** : Programming using Python	3		5	3	50	50	100
III	22AIU14	DSC	**Core –XI Practical- V** Machine Learning - Basics	3		5	3	50	50	100
III	22AIU15	DSC	**Core –XII** Machine Learning Basics	3	3		3	50	50	100
III	22AIU16	GE	**Allied-III** Operations Research	4	5		3	50	50	100
IV	22AIUE02	AEE	Open Elective-II	2	3		3	100		100
IV	22GSU02	AECC	Human Rights	1	2		2	50		50
IV	22AIUJ02	SEC	**Aptitude/Placement Training**	Grade*	2		2	50		50**
IV	22AIUJ03	SEC	**Online Course**	-	1			-	-	C/NC≠
Total				**26**	**26**	10		**450**	**300**	**750**
Semester – IV										
III	22AIU17	DSC	**Core -XIII** Artificial Intelligence **&**Knowledge Representation	5	5		3	50	50	100

III	22AIU18	DSC	**Core -XIV** R Programming	5	5		3	50	50	100
III	22AIU19	DSC	**Core -XV Practical- VI** Natural Language Processing	3		5	3	50	50	100
III	22AIU20	DSC	**Core -XVI Practical- VII** R Programming	3		5	3	50	50	100
III	22AIU21	GE	**Allied-IV** Business Accounting	4	5		3	50	50	100
III	22AIU22	DSE	**Electives / DSE-I**	4	4		3	50	50	100
III	22AIU23	SEC	Internship/ Institutional Training /**Mini-Project**	1	-		-	100	-	100
IV	22AIUV03	ACC	VAC–III	1*	2		2	50	-	50**
IV	22AIUJ04	SEC	**Aptitude/ Placement Training**	Grade*	2		2	50		50**
IV	22AIUJ05	SEC	**Online Course**	-	1		-	-	-	C/NC≠
IV	22GSU03	AECC	Internet Security	1	2		2	50	-	50
V	22GSU04	AECC	Extension Activities/ NSS/NCC/SPORT S/YRC/SIS/SA#	2	-		-		-	C/NC≠
Total				**28**	**26**	10		**450**	**300**	**750**
Semester – V										
III	22AIU24	DSC	**Core -XVII** Advanced Machine Learning techniques	5	5		3	50	50	100
III	22AIU25	DSC	**Core -XVIII** Deep Learning	5	5		3	50	50	100
III	22AIU26	DSC	**Core -XIX Practical- VIII** Deep Learning	3		6	3	50	50	100
III	22AIU27	DSC	**Core- XX Practical - IX** Client Relationship Management	3		6	3	50	50	100
III	22AIU28	DSE	**Electives / DSE-II**	4	5		3	50	50	100
IV	22AIUE03	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	22AIUV04	ACC	VAC–IV	1*	2			50	-	50**
IV	22AIUJ06	SEC	**Aptitude/ Placement Training**	Grade*	2		2	50		50**
IV	22AIUJ07	SEC	**Online Courses**		1			-	-	C/NC≠

IV	22AIUJ08	SEC	**SDR-Student Development Report**	2*	-	-	-	-	-	-
Total				**24**	**24**	12		**450**	**250**	**700**
Semester – VI										
III	22AIU29	DSE	**Electives-DSE- III**	4	5	-	3	50	50	100
III	22AIU30	DSE	**Electives-DSE–IV**	4	5	-	3	50	50	100
III	22AIU31	DSC	**Core-XXI Self-Study Course**	3	-	-	3	50	50	100
III	22AIU32	SEC	**Project Work / Student Research/Paper**	5	5			50	50	100
Total				**16**	**15**			**200**	**200**	**400**
Grand Total				**144**						**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
- ≠ 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 FOR SCHEME OF EXAMINATION

(For the candidates 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	**76**	100	**2100**
	Allied/**GE**	4	4	**16**	100	**400**
	Electives/**DSE**	4	4	**16**	100	**400**
	Project **SEC**	1	5	**5**	100	**100**
	Internship/Institutional Training/Mini-Project	*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**
	Value Added Course	*2*	*1*	*2**	*50*	***100*****
	Placement/Aptitude **SEC**	4	Grade*	Grade*	50	**200****
	Online courses/ **SEC**	3	-	-	-	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	-	2	-	C/NC
	Total			**144+ (6 Extra Credits)**		**4150 +(400*)**

List of Open Elective Papers & VAC / JOC	
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
	Disaster Management
	Green Farming
	Campus to Corporate
	Start-up Business
	Research Methodology and IPR
	General Studies for Competitive Examinations
	IIT JAM Examination (for Science only)
	CUCET Examination
Value Added Courses	a) Digital Marketing
	b) VM Ware
	c) Animation and its Technique
	d) Multimedia and its Applications
	e) Project Management
	f) Mongo DB
	g) E-Learning

Syllabus Coordinator

Academic Council – Member Secretary

BOS-Chairman/Chairperson

Dr. S. SASIKALA
M.Sc.,MCA.,M.Phil.,PGDPM & IR.,Ph.D.,SET
Head & Associate Professor
Department of Computer Science with Cognitive Systems
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PRINCIPAL

List of Elective Papers / DSE (Can choose any one of the paper as electives)		
	Course Code	**Title**
Electives/ **DSE-I**	22AIU22A	**Electives/DSE-I** IT Infrastructure Library(OR)
	22AIU22B	**Electives/DSE-I** Business Data Analytics (OR)
	22AIU22C	**Electives/DSE-I** Web Technologies and Multimedia
Electives/ **DSE-II**	22AIU28A	**Electives/DSE-II** IT Cognition(OR)
	22AIU28B	**Electives/DSE-II** Compiler Design(OR)
	22AIU28C	**Electives/DSE-II** Internet of Things
Electives/ **DSE-III**	22AIU29A	**Electives-DSE-III** Introduction to Industry 4.0 and Industrial Internet of Things (OR)
	22AIU29B	**Electives-DSE-III** Cryptography And Network Security (OR)
	22AIU29C	**Electives-DSE-III** Computer Vision
Electives/ **DSE-IV**	22AIU30A	**Electives-DSE–IV** Cloud computing (OR)
	22AIU30B	**Electives-DSE–IV** Software Engineering (OR)
	22AIU30C	**Electives-DSE–IV** Reinforcement Learning

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	
Report	50	50	b)Review/Work		
Viva-voce	25	50	diary*	30	50
Total	100	100	E.E** :a) Evaluation	30	
			b)Viva-voce	20	50
				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 50 x 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 x 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 (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 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.

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING				CLASS: I B.SC (AIML)				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours / Week**	**CIA**	**Ext**	**Total**
I	DSC	22AIU01	**Core-I** Object Oriented Programming in C++	4	4	50	50	100

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

Course Objectives

- To evaluate the basic knowledge of object-oriented programming, the fundamental concepts of C++.
- To infer stand-alone C++ applications.
- To explain the overloading concepts and pointers
- To classify and implement the concepts of pointers in C++
- To connect programs incorporating the programming constructs of object oriented programming concepts

Unit	Course Contents	Hours	K Level
I	Introduction to C++ - key concepts of Object-Oriented Programming –Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures: - Decision Making and Statements: If... else, jump, goto, break, continue, Switch case statements - Loops in C++: for, while, do - functions in C++ - inline functions – Function Overloading	10	UPTO K4
II	Classes and Objects: Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – Bit fields and classes – String – Declaring and Initializing string objects – String Attributes – Miscellaneous functions.	10	UPTO K4
III	Operator Overloading: Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchal, Hybrid, Multi path	8	UPTO K4

	inheritance – Virtual base Classes – Abstract Classes		
IV	Pointers: Declaration – Pointer to Class, Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object – Binding, Polymorphism and Virtual Functions.	10	UPTO K4
V	Files: File stream classes – file modes – Sequential Read / Write operations – Binary and ASCII Files– Random Access Operation – Templates – Exception Handling - Constructor and destructor with static members.	10	UPTO K4

Book for Study

1. Ashok N Kamthane, Object-Oriented Programming with Ansi and Turbo C++, Pearson Education, 2017

Books for Reference

1. E. Balagurusamy, Object-Oriented Programming with C++, TMH, 2017
2. VardanGrigoryan, Shunguang Wu, Expert C++, Packt Publishing, 2020.
3. John R Hubbard, Programming with C++, 2nd Edition, TMH publication, 2000.
4. Michael Dawson, "Beginning C++ Through Game Programming"
5. Bjarne Stroustrup, "The Design and Evolution of C++"

Web Resources

1. https://www.w3schools.com/cpp/
2. https://www.cplusplus.com/

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

Rationale for Nature of the Course: Can understand about the knowledge of object-oriented programming, the fundamental concepts of C++, and design and program stand-alone C++ applications.

Activities to be given

1. Conduct investigations of inheritance

2. Program on operator overloading

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CLO1	Explain the procedural and object-oriented paradigm with conceptsof streams	UPTO K4
CLO2	Analyze the various basic programming constructs like decision making	UPTO K4
CLO3	Differentiate the object-oriented concepts like overloading, inheritance, polymorphism,	UPTO K4
CLO4	Illustrate the various file stream classes; file types, usage of templates and exception handling mechanisms	UPTO K4
CLO5	Categorize programs incorporating the programming constructs of object oriented programming concepts	UPTO K4

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

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

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

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
Dr.S.Sasikala	Dr.S.Sasikala **Dr. S. SASIKALA** M.Sc.,MCA.,M.Phil.,PGDPM & IR.,Ph.D.,SET Head & Associate Professor Department of Computer Science with Cognitive Systems Hindusthan College of Arts & Science Coimbatore - 641 028.	

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING				CLASS: I B.SC (AIML)				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours / Week**	**CIA**	**Ext**	**Total**
II	DSC	22AIU02	**Core-II** Data Structures and Algorithm	4	4	50	50	100

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

Course Objectives

- To infer the concept of fundamental data structure.
- To classify and implement various data structure algorithm for developing applications.
- To order the types of software models
- To illustrate the importance of sorting
- To infer the types of trees and examine the designing methods

Unit	Course Contents	Hours	K Level
I	**Introduction:** Introduction to Algorithm –Arrays - Stacks and Queues- Fundamentals-**Linked List:** -Singly Linked List – doubly linked list and Dynamic-Sparse Matrices- Polynomial addition.	10	UPTO K4
II	**Trees:** Binary tree representations – Binary Tree Traversal – Threaded Binary Trees -Counting binary trees. **Graphs:** Terminology and representations - Traversals, Connected Components.	10	UPTO K4
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-Polyphase Merge.	08	UPTO K4
IV	**Symbol tables:** Static tree table –Dynamic Tree Tables-Hash tables - Hashing Functions-overflow handling-Theoretical evaluation of overflow techniques.	10	UPTO K4
V	**Files:** Files, Queries and Sequential organizations **Index Techniques:** -Hashed Index - Sequential organizations-Random Organization- Linked Organization	10	UPTO K4

Book for Study

1. Ellis Horowiz, Sartaj Sahni and Sangu thevar, "Fundamentals of Data Structure", Galgotia Publications

Books for Reference

1.Shmuel Tomi Klein," Basic Concepts in Data Structures", Cambridge University, 1ST Edition, 2016.
2.Ellis Horowitz, Sartaj Sahni, Susan Anderson Freed, "Fundamentals Of Data Structures In C", Universities Press (India) Limited, 2017.
3. Mark Allen Weiss," Data Structure in Algorithm analysis in C", Pearson Education, Second Edition, Sixteenth Impression 2014.
4. Introduction to Algorithms by Thomas H. Cormen
5. Algorithms Unlocked by Thomas Cormen

Web Resources

1. https://www.geeksforgeeks.org/data-structures/
2. https://www.javatpoint.com/data-structure-tutorial

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

Rationale for Nature of the Course: These are necessary to **understand the concept of fundamental data structure.**

Activities to be given

1. Assignment on stacks and queues
2. Case study assignment on the data structure in real world problems

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CLO1	Illustrate the fundamental concepts of data structures.	UPTO K4
CLO2	Classify the concepts of trees and graphs.	UPTO K4
CLO3	Analyze and experiment concepts of sorting.	UPTO K4
CLO4	Analyze classify concepts of merging and Files.	UPTO K4
CLO5	Explain different type of database models	UPTO K4

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

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

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

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
R.Jayakumar Mr.R.Jayakumar	Dr.S.Sasikala Dr. S. SASIKALA M.C.A., M.Phil., PGDPM & IR., M.B.A., SET Head & Associate Professor Department of Computer Science with Cognitive Systems Hindusthan College of Arts & Science Coimbatore - 641 028.	

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING				CLASS: I B.SC (AIML)				
Sem	**Course Type**	**Course Code**	Course Title	**Credits**	**Contact Hours / Week**	**CIA**	**Ext**	**Total**
I	DSC	22AIU03	**Core-III** 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

- To devise the concepts of Object-Oriented Programming Paradigm and the programming constructs of C++.
- To organize the various basic programming constructs like decision making statements.
- To illustrate the Looping statements, functions, pointers overloading, inheritance, polymorphism,
- To explain virtual functions , constructors and destructors
- To classify pointers and strings programs

Ex.No	Program	Hours	K Level
1	Write a C++ Program to create a class to implement the data structure STACK. Write a constructor to initialize the TOP of the STACK. Write a member function PUSH () to insert an element and member function POP () to delete an element check for overflow and underflow conditions.	**4**	UPTO K4
2	Write a C++ Program to create a class ARITHMETIC which consists of a FLOAT and an INTEGER variable. Write member functions ADD (), SUB (), MUL (), DIV () to perform addition, subtraction, multiplication, division respectively. Write a member function to get and display values.	**4**	UPTO K4
3	Write a C++ Program to read an integer number and find the sum of all the digits until it reduces to a single digit using constructors, destructors and inline member functions.	**4**	UPTO K4

4	Write a C++ Program to create a class FLOAT that contains one float data member. Overload all the four Arithmetic operators so that they operate on the object FLOAT.	**4**	UPTO K4
5	Write a C++ Program to create a class STRING. Write a Member Function to initialize, get and display stings. Overload the operators ++ and == to concatenate two Strings and to compare two strings respectively.	**4**	UPTO K4
6	Write a C++ Program to create class, which consists of EMPLOYEE Detail like E_Number, E_Name, Department, Basic, Salary, Grade. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade.	**4**	UPTO K4
7	Write a C++ Program to create a class SHAPE which consists of two VIRTUAL FUNCTIONS	**4**	UPTO K4
8	Write a C++ Program to create two classes each class consists of two private variables, a integer and a float variable. Write member functions to get and display them. Write a FRIEND Function common to both classes, which takes the object of above two classes as arguments and the integer and float values of both objects separately and display the result.	**4**	UPTO K4
9	Write a C++ Program using Function Overloading to read two Matrices of different Data Types such as integers and floating point numbers. Find out the sum of the above two matrices separately and display the sum of these arrays individually.	**4**	UPTO K4
10	Write a C++ Program to check whether the given string is a palindrome or not using Pointers.	**4**	UPTO K4
11	Write a C++ Program to create a File and to display the contents of that file with line numbers.	**4**	UPTO K4
12	Write a C++ Program to merge two files into a single file.	**4**	UPTO K4

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

Rationale for Nature of the Course: Can understand about the develop concepts of Object-Oriented Programming Paradigm and the programming constructs of C++.

Activities to be given

1. **To familiarize students with STACK.**
2. **To write a C++ Program to read an integer number and number systems.**

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CLO1	Explain concepts of Object-Oriented Programming Paradigm and the programming constructs of C++.	UPTO K4
CLO2	Focus on various basic programming constructs in decision making statements.	UPTO K4
CLO3	Connect the functions, concepts like overloading, inheritance, polymorphism	UPTO K4
CLO4	Illustrate the concept of Virtual Classes, inline functions and friend functions	UPTO K4
CLO5	Prioritize the various file stream classes, file types, usage of templates and exception handling mechanisms.	UPTO K4

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

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

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

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
Ms.E.Kavipriya	Dr.S.Sasikala Dr. S. SASIKALA M.Sc., MCA., M.Phil., PGDPM & IR., Ph.D., SET Head & Associate Professor Department of Computer Science with Cognitive Systems Hindusthan College of Arts & Science Coimbatore - 641 028.	

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING				CLASS: I B.SC (AIML)				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours / Week**	**CIA**	**Ext**	**Total**
II	DSC	22AIU05	**Core -IV** Java Programming	4	4	50	50	100

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

Course Objectives

- To analyze the basic knowledge of object-oriented programming, the fundamental concepts of java.
- To prioritize and program stand-alone Java applications.
- To understand how to design applications with threads in Java.
- To analyze and implement the concepts of Exception Handling in java
- To deduce about Java applications with Graphical User Interface (GUI) using AWT

Unit	Course Contents	Hours	K Level
I	**Introduction to Java**: Features of Java - History of Java-Structure – Java Tokens – Statements – Java Virtual Machine - Data Types - Variables - Operators - Decision Making and Branching - Decision Making and Looping	10	UPTO K4
II	**Object Oriented concepts:** Classes, Objects and Methods: Methods & variables - Constructor-Overloading - Static members - Final Classes – Abstract method- Arrays, Strings and Vectors. – Interfaces: Multiple Inheritance –Extending interfaces-implementing interfaces. Packages: Putting Classes together-creating, accessing & using packages.	12	UPTO K4
III	**Multithreaded Programming:** creating Threads - Extending Threads -Thread life cycle- Thread Exception-Priority-Implementing Runnable interface. **Managing Errors and Exceptions:** Introduction-Exception handling – Exceptions- Multiple Catch statement-using finally statement– Applet Programming – Graphics Programming.	14	UPTO K4
IV	**Files:** Managing Input / Output Files in Java: Concepts	10	UPTO K4

	of Streams- Stream Classes – Byte Stream classes – Character stream classes – Using streams – I/O Classes – File Class – I/O exceptions – Creation of files – Reading / Writing characters, Byte-Handling Primitive data Types – Random Access Files.		
V	**Advanced concepts of Java:** AWT Class and Controls: Introduction -AWT class - AWT controls-Labels, Buttons, CheckBox, List, TextField, TextArea– AWT managers and menus – Layout manager – MenuBar & Menus - Event handling by AWT components. Introduction: Java Bean - Socket Programming – Servlets - Java Server Pages, JDBC.	14	UPTO K4

Book for Study

1. Balagurusamy.E, "Programming with Java – A Primer", TMH, 6th Edition. 2019

Books for Reference

1. Patrick Naughton& Herbert Schildt, "The Complete Reference Java ", TMH, 10th Edition, 2017.
2. John R. Hubbard, "Programming with Java", TMH, 2nd Edition.2004
3. Herbert Schildt, "The Complete Reference Java", Paperback, 11th Edition, 2018
4. Sachin Malhotra, Saurabh Chaudhary,"Programming with Java", Oxford University Press, 6thEdition. 2013.
5. Head First Java Authors: Kathy Sierra & Bert Bates
6. Thinking in Java Author: Bruce Eckel

Web Resources

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

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

Rationale for Nature of the Course: Can understand about the basic knowledge of object-oriented programming, the fundamental concepts of java.

Activities to be given

1. **Develop the Basic Programs**
2. **To work with the** Operators
3. **To work with Java Bean**
4. **To work with AWT class**

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CLO1	Differentiate the principles of Java programming.	UPTO K4
CLO2	Connect and experiment the concepts Object Oriented Programming and Develop java standalone applications.	UPTO K4
CLO3	Analyze the robust & concurrent application using Multithreading and Exception handling concepts.	UPTO K4
CLO4	Illustrate the Java applications with Graphical User Interface (GUI)using AWT	UPTO K4
CLO5	Infer the pros and cons of other object oriented language with the concepts of JAVA	UPTO K4

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

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

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

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
Dr.S.Sasikala	Dr.S.Sasikala	

Dr. S. SASIKALA M.Sc.,MCA.,M.Phil.,PGDPM & IR.,Ph.D.,SET Head & Associate Professor Department of Computer Science with Cognitive Systems Hindusthan College of Arts & Science Coimbatore - 641 028.

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING				CLASS: I B.SC (AIML)				
Sem	**Course Type**	**Course Code**	Course Title	**Credits**	**Contact Hours / Week**	**CIA**	**Ext**	**Total**
II	DSC	22AIU06	**Core -V** Practical II: Programming using Java	2	4	50	50	100

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

Course Objectives

- To Dissect the Standalone Java Programs.
- To evaluate java applications using packages & collection interfaces.
- To explain and Develop GUI Applications using Abstract Window Tool Kit.
- To illustrate GUI Application using Applet.
- To infer the Applications using Swing.

Ex.No	Program	Hours	K Level
1	Write the java program for the manipulation of string class.	**4**	UPTO K4
2	Write a java program to implement the multiple inheritance using interfaces.	**4**	UPTO K4
3	Write a java program to demonstrate the use of packages.	**4**	UPTO K4
4	Write a java program to implement the concept of Multithreading.	**4**	UPTO K4
5	Write a java program to create an Exception and throw the exception.	**4**	UPTO K4
6	Write a java program to demonstrate Graphics and Applet class.	**4**	UPTO K4
7	Write a java program to implement the concept of Applet & AWT Events.	**4**	UPTO K4
8	Develop a Java Program to implement Swing concepts.	**4**	UPTO K4
9	Develop a GUI program using Swing components.	**4**	UPTO K4
10	Write a java program which open an existing file and append the text to that file.		UPTO K4
11	Develop a program to Analyze the Gene sequence.	**4**	UPTO K4
12	Write a program for calculating Biocomputing.	**4**	UPTO K4

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

Rationale for Nature of the Course: Can understand about • packages & collection interfaces **Develop java applications using**

Activities to be given

1. To write a java program to implement the multiple inheritance using interfaces.

2. To develop a GUI program using Swing components

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CLO1	Infer and Develop Java problems using object-oriented concepts	UPTO K4
CLO2	Classify java applications using packages & collection interfaces.	UPTO K4
CLO3	Illustrate and Develop concurrent Applications using Multithreading	UPTO K4
CLO4	Correlate Event driven and Graphical User Interface programming using AWT and Applet	UPTO K4
CLO5	Analyze and experiment Applications using Swing.	UPTO K4

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

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

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

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
Mr.R.Jayakumar	Dr. S. Sasikala	

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING				CLASS: I B.SC (AIML)				
Sem	**Course Type**	**Course Code**	Course Title	**Credits**	**Contact Hours / Week**	**CIA**	**Ext**	**Total**
II	DSC	22AIU07	**Core -VI** Practical III: Internet Basics	2	3	50	50	100

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

Course Objectives

- To explain the fundamentals of Internet and the Web functions.
- Impart knowledge and essential skills necessary to use the internet and its various components.
- To explain, evaluate, and use online information resources.
- Essential use of Google Apps for education effectively.
- To deduce forms for effective data analysis

Ex.No	Program	Hours	K Level
1	Create an email account in Gmail. Using the account created compose a mail to invite other college students for your college fest, enclose the invitation as attachment and send the mail to at least 50 recipients. Use CC and BCC options accordingly	**3**	UPTO K4
2	Open your inbox in the Gmail account created, check the mail received from your peer from other college inviting you for his college fest, and download the invitation. Reply to the mail with a thank you note for the invite and forward the mail to other friends	**3**	UPTO K4
3	Assume that you are studying in final year of your graduation and are eagerly looking for a job. Visit any job portal and upload your resume.	**3**	UPTO K4
4	Create a meeting using Google calendar and share meeting id to the attendees. Transfer the ownership to the Manager once the meeting id is generated.	**3**	UPTO K4
5	Create a label and upload bulk contacts using import option in Google Contacts	**3**	UPTO K4
6	Create your own Google classroom and invite all your friends through email id. Post study material in Google classroom using Google drive. Create a separate folder	**3**	UPTO K4

	for every subject and upload all unit wise E-Content Materials.		
7	Create and share a folder in Google Drive using _share a link‘ option and set the permission to access that folder by your friends only.	**3**	UPTO K4
8	Create one-page story in your mother tongue by using voice recognition facility of Google Docs	**3**	UPTO K4
9	Create a question paper with multiple choice types of questions for a subject of your choice, using Google Forms.	**3**	UPTO K4
10	Create a meet using Google Calendar and record the meet using Google Meet. Create a Google slides for a topic and share the same with your friends.	**3**	UPTO K4
11	Create template for a seminar certificate using Google Slides.	**3**	UPTO K4
12	Create a sheet to illustrate simple mathematical calculations using Google Sheets. Create student‘s internal mark statement and share the Google sheets via link.	**3**	UPTO K4

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

Rationale for Nature of the Course: Can understand about the fundamentals of Internet and the Web functions

Activities to be given
1. To create an email account in Gmail
2. To create a question paper with multiple choice types

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CLO1	Dissect the internet concepts and basics	UPTO K4
CLO2	Classify the predefined procedures to create Gmail account, check and receive messages	UPTO K4
CLO3	Evaluate various basic operations on internet	UPTO K4
CLO4	Evaluatethe challenges of Google applications like docs,Google classroom, Google drive, Google meet	UPTO K4
CLO5	Classify the Google forms and slides for effective data analysis and presentation	UPTO K4

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

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

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

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
Ms.E.Kavipriya	Dr.S. Sasikala	

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING				CLASS: I B.SC (AIML)				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours / Week**	**CIA**	**Ext**	**Total**
II	DSC	22AIU08	**Core -VII** Fundamentals of Artificial Intelligence and Robotics	4	4	50	50	100

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

Course Objectives

- To connect the basic concepts of robotics and its characteristics
- To infer the different physical forms of robot architectures.
- To introduce about the actuators and characteristics of actuating system
- To experiment mathematically about kinematic robot system.
- To infer manipulation and navigation problems using knowledge of coordinate frames, kinematics, optimization, control, and uncertainty.

Unit	Course Contents	Hours	K Level
I	Introduction: Objective, scope and outcome of the course Meaning and definition of artificial intelligence, Physical Symbol System Hypothesis.	10	UPTO K4
II	AI problems, foundation of AI and history of AI intelligent agents: Agents and Environments, the concept of rationality,	12	UPTO K4
III	Introduction to Robotics: Classification, Components, Characteristics, Applications. Robotic. Kinematics: Transformation Matrices, Forward and Inverse Kinematics.	14	UPTO K4
IV	Actuators: Characteristics of Actuating Systems, Actuating Devices and Control.	10	UPTO K4
V	Sensors: Sensor Characteristics, Description of Different Sensors. Dynamic characteristics- speed of motion, load carrying capacity & speed of response- Kinematics- Manipulators Kinematics, Rotation Matrix.	14	UPTO K4

Book for Study

1. S. Russel and P. Norvig, "Artificial Intelligence – A Modern Approach", SecondEdition, Pearson Education

Books for Reference

1. J. Nilsson, "Artificial Intelligence: A new Synthesis", Elsevier Publishers
2. R.K.Mittal and I J Nagrath, Robotics and Control, TMH, 2013.
3. Computational Intelligence, Davis Poole, Alan Mackwath, Randy Coehel, Oxford University Press
4. Industrial Robotics / Groover M P /McGraw Hill
5. Introduction to Robotics / John J. Craig/ Pearson

Web Resources

- https://onlinecourses.swayam2.ac.in/aic20_sp06/preview
- https://onlinecourses.swayam2.ac.in/arp19_ap79/preview

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

Rationale for Nature of the Course: Can understand about the basic knowledge of robotics, kinematics, actuators and sensors

Activities to be given

1. Explore types of Robots

2. To demonstrate with simple day to day automation through working model

Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K - Level
CLO1	To analyze basic concepts of robotics and its characteristics	UPTO K4
CLO2	Categorize the concepts of different physicalforms of robot architectures.	UPTO K4
CLO3	Connect the various methodologies of actuators and characteristics of actuating system	UPTO K4
CLO4	Devise the concepts of mathematical kinematic robot system	UPTO K4
CLO5	Focus the knowledge of coordinate frames, kinematics, optimization, control, and uncertainty.	UPTO K4

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

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

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

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
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