

COURSE INFORMATION SHEET (CIS)

1. Course Particulars

Course Title: Elective-I (IOT&ES)	Level: UG	Academic Year: 2025-26
Course Code: 310245(A)	L:T:P: 03:00:00	Semester: Fifth
Pattern: 2019	Total Hours: 42	Class: TE (A & B)
Insem Marks: 30	Credits: 03	
EndSem Marks: 70	Total Marks: 100	

2. Course Instructor: Mr. Parag Achaliya

3. Prerequisite

Course Name	Description	Sem
Digital Electronics and Logic Design (210245)	To understand the basics of digital electronics & logic design in computer science using basic electronics engg.	Second

4. Course Description

- **This course is designed**
- To understand the fundamentals of the Internet of Things (IoT) and Embedded Systems
- To learn advances in Embedded Systems and IoT
- To learn methodologies for IoT application development
- To learn the IoT protocols, cloud platforms, and security issues in IoT
- To learn real-world application scenarios of IoT along with its societal and economic impact using case studies and real-time examples
- **This program will teach** how to use the IoT in our day to day life. IOT emphasizes different platforms adopted by many companies to effectively use IoT.
- **A prerequisite is DELD** where this subject focuses on how the communication between various systems takes place and which different technologies are used for the same. Also, it focuses on the basics of digital electronics & logic design in computer science.

5. Role of Course

Internet of Things is used in real-world applications as follows:

- | | |
|----------------------|---------------------------|
| 1. Agriculture Field | 3. Educational Institutes |
| 2. Service Industry | 4. Government Sectors |

6. Modes of Content Delivery:

Blackboard Teaching	Visual Aids	Assignments	Virtual Labs	Seminar	Guest / Expert Lecture	Group Discussion / Quiz	Case Study	Mini Project
Yes	Yes	Yes			Yes		Yes	

University Course Outcomes:

C305.1: Understand the fundamentals and need of Embedded Systems for Internet of Things

C305.2: Apply IoT enabling technologies for developing IoT systems

C305.3: Apply design methodology for designing and implementing IoT applications

C305.4: Analyze IoT protocols for making IoT devices communication

C305.5: Design cloud based IoT systems

C305.6: Design and Develop secured IoT applications

Reformed Course Outcomes (CO):

Course Outcome	After successful completion of the course students should be able to	Bloom's Taxonomy	Target Set	Competencies
C305.1	Understand the fundamentals and need of Embedded Systems for Internet of Things	Level 2 - Understand	50%	Students will be able to understand the fundamentals and need of Embedded Systems for Internet of Things
C305.2	Apply IoT enabling technologies for developing IoT systems	Level 3 - Apply	50%	Students will be able to apply IoT enabling technologies for developing IoT system
C305.3	Apply design methodology for designing and implementing IoT applications	Level 3 - Apply	50%	Students will be able to apply design methodology for designing and implementing IoT applications
C305.4	Analyze IoT protocols for making IoT devices communication	Level 4 - Analyze	50%	Students will be able to analyze IoT protocols for making IoT devices communication
C305.5	Design cloud based IoT systems	Level 6 - Create	50%	Students will be able to design cloud based IoT systems
C305.6	Design and Develop secured IoT applications	Level 6 - Create	50%	Students will be able to design and develop secured IoT applications

Justification for threshold:

Academic Year	No. Of Students Appeared (X)	Total Marks Secured by All (Y)	Avg Marks (Y/X)	Target Set	Count Achieving Tgt (Z)	% of students achieving Tgt (Z/X)	Attainment Level Attained	This Years CO Tgt
2021-22	72	6255	86.87	50	72	100	3	50
2022-23	68	3320	48.82		38	55.88	2	
2023-24	111	6324	56.97		80	72.07	3	
2024-25	69	4213	61.06		62	89.86	3	
2025-26	174							

8. COs Attainment level (Direct Attainment):

Attainment Level (AL)	
AL3 (High)	70% students score more than 50% marks (Threshold) out of the relevant maximum marks
AL2 (Medium)	60% students score more than 50% marks (Threshold) out of the relevant maximum marks
AL1 (Low)	50% students score more than 50% marks (Threshold) out of the relevant maximum marks

9. Course Outcome Attainment (Direct Attainment):

Course Attainment	Direct Assessment Tools								Avg
	%	IA1	%	IA2	%	IA3	%	CA	
C305.1	42.34	0					100.00	3	1.50
C305.2	25.55	0					100.00	3	1.50
C305.3			26.09	0			100.00	3	1.50
C305.4			0.00	0			100.00	3	1.50
C305.5					62.07	2	100.00	3	2.50
C305.6					60.34	2	100.00	3	2.50
	Average								1.83
	Weightage (Direct)								20
	CO Attainment for Direct Tools								2.77

10. Mapping of Course Outcomes, Program Outcomes and Program Specific Outcomes (with correlation level):

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C305.1	3	1	1	2					1		1		1	1	
C305.2	3	2	1	2	1									1	1
C305.3	2	3	3	3	2	3			2		1			2	
C305.4	1	2	2	2	3	3			2	1	2	2	2		
C305.5	2	2	2	3	3	3			2	1	2	2		2	
C305.6	2	2	1	2	2	2		1	1		1	1			2
Avg	2.17	2.00	1.67	2.33	2.20	2.75	0.00	1.00	1.60	1.00	1.40	1.67	1.50	1.50	1.50
Direct	2.00	1.84	1.54	2.15	2.03	2.54	0.00	0.92	1.48	0.92	1.29	1.54	1.38	1.38	1.38
Indirect	2.17	2.00	1.67	2.33	2.20	2.75	0.00	1.00	1.60	1.00	1.40	1.67	1.50	1.50	1.50
Avg	2.08	1.92	1.60	2.24	2.11	2.64	0.00	0.96	1.54	0.96	1.35	1.60	1.44	1.44	1.44

Correlation Level(CL): 1-Low; 2-Moderate; 3-High; - Not Applicable

10.1. Mapping of COs, POs, and PSOs with Justification

COs	After successful completion of the course students should be able to	Low (1)	Moderate (2)	High (3)	Justification
C305.1	Understand the fundamentals and need of Embedded Systems for Internet of Things	PO2, PO3, PO9, PO11, PSO1, PSO2	PO4	PO1	PO: As per University syllabus. PSO1, PSO2: Professional Skills, Problem-Solving Skills are required to Understand the fundamental and need of Embedded Systems for Internet of Things
C305.2	Apply IoT enabling technologies for developing IoT systems	PO3, PO5, PSO2, PSO3	PO2, PO4	PO1	PO: As per University syllabus. PSO2, PSO3: Problem - Solving Skills are required which is useful for Successful Career and Entrepreneurship.
C305.3	Apply design methodology for designing and implementing IoT applications	PO11	PO1, PO5, PO9, PSO2	PO2, PO3, PO4, PO6	PO: As per University syllabus. PSO2: Problem-Solving Skills are required to apply design methodology for designing and implementing IoT applications.
C305.4	Analyze IoT protocols for making IoT devices communication	PO1, PO10	PO2, PO3, PO4, PO9, PO11, PO12, PSO1	PO5, PO6	PO: As per University syllabus. PSO1: Professional Skills are required to analyze IoT protocols for making IoT devices communication.
C305.5	Design cloud based IoT systems	PO10	PO1, PO2, PO3, PO9, PO11, PO12, PSO2	PO4, PO5, PO6	PO: As per University syllabus. PSO2: Problem-Solving Skills are required to design cloud based IoT systems
C305.6	Design and Develop secured IoT applications	PO3, PO8, PO9, PO11, PO12	PO1, PO2, PO4, PO5, PO6, PSO3		PO: As per University syllabus. PSO: Designing & Development of secured IoT applications will helpful for Successful Career and Entrepreneurship

11. COs Feedback from Students:

11.1 COs Feedback Form (Indirect Assessment)

Course Outcomes Feedback Form

Course Title: Elective-I (IOT&ES)	Level: UG	Academic Year:2021-22
Class: TE	Course Code: 310245A	Pattern: 2019
Course Instructor: Mr. Parag Achaliya	Semester: Fifth	Class & Division: TE (B)
Name of Student: -----		Roll No. -----
Instructions to Students: Read the following CO's Statement carefully before giving Feedback		
COs	After successful completion of the course student should be able to	
C305.1	Understand the fundamentals and need of Embedded Systems for Internet of Things	
C305.2	Apply IoT enabling technologies for developing IoT system	
C305.3	Apply design methodology for designing and implementing IoT applications	
C305.4	Analyze IoT protocols for making IoT devices communication	
C305.5	Design cloud-based IoT systems	
C305.6	Design and Develop secured IoT applications	

To enhance the OBE (Outcome Based Education), your feedback is extremely important to us. Please mark your response against each QUESTION/ITEM.

[Note: Rating scales are 4: 100%-81%, 3: 80-61%, 2: 60-41%, and 1: 40%]

Table 3: Course Exit Survey (Indirect Method)

SCORE		CO1	CO2	CO3	CO4	CO5	CO6
4	81 - 100 %	31	32	30	30	29	29
3	61 - 80 %	14	11	13	14	13	14
2	41 - 60 %	0	2	2	1	3	2
1	below 40 %	0	0	0	0	0	0
TOTAL		45	45	45	45	45	45
Attainment Level		3	3	3	3	3	3
Average Attainment Level							3

12. Summary of COs, POs, and PSOs:

12.1 Summary of COs Attainment:

Course	Direct Attainment (in terms of AL)	Target Achieved (Yes/No)	Observations/Actions for Improvement
C305	2.77	No	Given in the table below.

Course	Indirect Attainment (in terms of AL)	Target Achieved (Yes/No)	Observations/Actions for Improvement
C305	3	Yes	Given in the table below.

12.2 Summary of POs and PSOs Attainment:

Summary of POs/PSOs Attainment (in terms of AL)															
Course/Attainment	Program Dependent POs					Program Independent POs							PSOs		
CO204	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
Direct Attainment	2.00	1.84	1.54	2.15	2.03	2.54	0.00	0.92	1.48	0.92	1.29	1.54	1.38	1.38	1.38
Indirect Attainment :	2.17	2.00	1.67	2.33	2.20	2.75	0.00	1.00	1.60	1.00	1.40	1.67	1.50	1.50	1.50
COs: POs/PSOs Attainment	2.08	1.92	1.60	2.24	2.11	2.64	0.00	0.96	1.54	0.96	1.35	1.60	1.44	1.44	1.44

Observation	Action Plan
Target is not achieved.	Need more focus on internal assessments.

Parag Achaliya
Course Coordinator (CC)

Ms. M. D. Kawade
Module Coordinator (MC)

Dr. Mrs. K. M. Sanghavi
HoD