



C. U. SHAH UNIVERSITY
Wadhwan City

FACULTY OF: - Technology and Engineering
DEPARTMENT OF: - Information Technology
SEMESTER: - VIII
CODE: - 4TE08ITE1
NAME: – Internet of Things and Embedded System

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
							Marks	Hours	Marks	Hours	Pr/Viva	TW	Pr	
4TE08ITE1	Internet of Things and Embedded System	3	0	2	5	4	30	1.5	70	3.0	-	20	30	150

Objectives:

The learning objectives of this course are to:

- Learn overview of the current state of the art in the Internet of Things, connected product concepts, development platforms, user experience, challenges and future directions.
- learn the basic technical skills to design and prototype this new generation of "smart objects".

Prerequisites:

- Basic knowledge of Programming, Networking and Electronics.

Course outline:

Sr. No.	Course Contents	Total Hrs.
1	Introduction to the Internet of Things: Origins. Early concepts and products. Examples of current products and value propositions. Architectures and design patterns. Analysis of a full connected-object experience. State of the Art, challenges and future directions.	9
2	Prototyping Connected Objects: Open-source prototyping platforms. Basic Arduino programming. Extended Arduino libraries. Arduino-based Internet communication.	9
3	Integrating Internet Services: XML and JSON. HTTP APIs for accessing popular Internet services (Facebook, Twitter, and others).	10

4	User Experience and Interaction Design: The three levels of user engagement: aesthetics, functional and emotional. Good examples of user interaction design. Designing your own user experience.	10
5	Project Development and Competition: Development of a project including: value proposition, physical connected object prototyping, programming the behavior, accessing Internet services and designing the user experience.	10
	Total	48

Learning Outcomes:

On completing this subject, the student is expected to be competent in:

- Designing full connected-product experiences by integrating Internet services and physical objects.
- Analyzing, designing, and developing prototypes of Internet-connected products using appropriate tools.
- Identifying, classifying and describing different kinds of Internet-connected product concepts.
- Analyzing the challenges and applying adequate patterns for user-interaction with connected-objects.

Books Recommended:

- Mike Kuniavsky, **Smart Things: Ubiquitous Computing User Experience Design**, Morgan Kaufmann Publishers, 2010.
- Sara Cordoba, WimerHazenberg, Menno Huisman, **Meta Products: Building the Internet of Things**, BIS Publishers, 2011.
- MassimoBanzi, **Getting Started with Arduino (Make: Projects)**, O'Reilly Media, 2008.
- Donald A. Norman, **Emotional Design: Why We Love (or Hate) Everyday Things**, Basic Books, 2004.
- Tom Igoe, Dan O'Sullivan, **Physical Computing: Sensing and Controlling the Physical World with Computers**, Premier Press. 2004.