Course Description Form

1. Course Name:
Internet of Things
2. Course Code:
3. Semester / Year:
First Semester/ M.Sc. Year
4. Description Preparation Date:
20/10/2025
5. Available Attendance Forms:
- Theory Lectures - Practical Lab
6. Number of Credit Hours (Total) / Number of Units (Total)
60/2
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Abdulkareem Merhej Radhi Email: Abdulkareem.merhej@nahrainuniv.edu.iq
8. Practical Teaching
Projects using C++ & Python
9. Course Objectives

Course Objectives	This course aims to Design and implement an Internet of Things system from scratch. During this course, students will acquire multiple skills in building different types of Internet of Things systems according to the proposed applications. They will also have the ability and skill in how to invest in artificial intelligence systems in building systems capable of analyzing data and making smart decisions. In addition to learning about the different protocols that are used to send and receive data to and from the various units that make up those systems.

10.	Teaching and Learning Strategies
Strategy	The main strategy that will be adopted in delivering this module is by explaining lectures in an interactive way by letting the students to participate in the presenting through questions and answers while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and labs. This material includes: Introduction to how to use microcontrollers, microprocessors, and specialized programming languages in designing and implementing various applications. Also understanding the artificial intelligence algorithms that can be used to analyze data to make smart decisions and understanding the methods and means used to employ the World Wide Web to send and receive data from its various sources.

11. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	A Brief History of IOT	Introduction to IOT	Theoretical Lectures	Quiz
2	2	What is the main Characteristics of IOT	Characteristics of IOT	Theoretical Lectures	Quiz
3	2	Concept of Logical and Physical Design	Logical and Physical Design	Theoretical Lectures	Quiz
4	2	Communications protocols in IOT	Communications Protocols in IOT	Theoretical Lectures	Quiz
5	2	Introduction to sensors	Sensors in IOT Networks	Theoretical Lectures	Quiz
6	2	M2M & IOT concepts	Difference between IOT and M2M	Theoretical Lectures	Quiz
7	2	Practical Applications	Some application of IOT		
8	2	Microcontrollers	Introduction to Microcontroller	Theoretical Lectures	Quiz
9	2	C++ & Python	Introduction to |Microcontroller Languages	Theoretical Lectures	Quiz
10	2	Microprocessor Concepts	Introduction to Microprocessor	Theoretical Lectures	Quiz
11	2	Python	Introduction to |Microprocessor Languages	Theoretical Lectures	Quiz
12	2	Cleaning & Transforming	Data Processing and Analysis	Theoretical Lectures	Quiz
13	2	Big Data using Cloud	Cloud Computing	Theoretical Lectures	Quiz
14	2	Data Analysis	Fog Computing	Theoretical Lectures	Quiz

15	2		Case Studies	Theoretical Lectures	Quiz

12.Practical Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	IOT Project	Decision Making	Programming C++	Program complete
2	2		Microcontrollers	Programming C++	Program complete
3	2		Microcontrollers	Programming C++	Program complete
4	2		Microcontrollers	Programming C++	Program complete
5	2		Microprocessors	Programming Python	Program complete
6	2		Microprocessors	Programming Python	Program complete
7	2		Microprocessors	Programming Python	Program complete
8	2		Microprocessors	Programming Python	Program complete
9	2		Microprocessors	Programming Python	Program complete
10	2		Microprocessors	Programming Python	Program complete
11	2		Microprocessors	Programming Python	Program complete
12	2		Microprocessors	Programming Python	Program complete
13	2		Microprocessors	Programming Python	Program complete
14	2		Microprocessors	Programming Python	Program complete
15	2		Microprocessors	Programming Python	

13. Course Evaluation

10 Quizzes
5 Assignments
15 Lab
10 Report
10 Midterm Exam
50 Final Exam

14. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1.Internet of Things: A Hands-On Approach: Arsheep Bahga & Vijay Madisetti, 2015. 2. Jan Holler, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	