Republic of Iraq
Ministry of Higher Education & Scientific Research Supervision and Scientific Evaluation Directorate Quality Assurance and Academic Accreditation International Accreditation Dept.

Academic Program Specification Form
For The Academic

University: Tikrit university
College : Computer Science and Mathmatics
Number Of Departments In TheCollege:
Date Of Form Completion: 7/2/2024

TEMPLATE FOR PROGRAMME SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

PROGRAMME SPECIFICATION

This Program Specification provides a concise summary of the main features of the program and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It is supported by a specification for each course that contributes to the program.

1. Teaching Institution	College of computer science and mathematics
2. University Department/Centre	Department of Computer science
3. Program Title	Internet of Things (IoT)
4. Title of Final Award	Master's degree in computer science
5. Modes of Attendance offered	One semester
6. lecturer name	Asst.Prof.Dr. Muhaned Thiab Mahdee Al-Hashimi,
7. Other external influences	Not available
8. Date of production/revision of this specification	7/2/2024
9. Aims of the Program	
1- Describe what IoT is and how it works today	
2- Recognize the factors that contributed to the emergence of IoT	
3- Design and program IoT devices	
4- Use real IoT protocols for communication	
5- Secure the elements of an IoT device	
6- Design an IoT device to work with a Cloud Computing infrastructure.	
7- Transfer IoT data to the cloud and in between cloud providers	
8-Define the infrastructure for supporting IoT deployments	
9- Knowing and studying the electronic components that make up the Arduino boards.	

10- Knowing the Arduino IDE

A. A Cognitive goals

A1. The overall goal of this course is to enable you to build an IoT system from the ground up. Note, this is an IoT system; as you'll learn, there's extensive variety insofar as to what an IoT system can be. That said, during this course, you'll learn the various kinds of IoT systems that you'll encounter and build one using representative technologies.

B. The skills goals special to the program .

B1 - Familiarity with how to build an Internet of Things system
B2 - Learn the different types of IoT systems
B3 - Building a system using some simulation software.
B4 - Knowledge of the Arduino IDE
B5 - Programming the Arduino board

Teaching and Learning Methods

1-Theoretical lectures
2- E-Learning
3- Using some simulation software to program the Arduino board
4- Using skills and presenting lectures electronically

Assessment methods

1- Theoretical exams.
2- Practical exams.

C. Affective and value goals

C1. Building the student's personality and ability to make decisions.

Teaching and Learning Methods

1- lectures
2- Lab & Arduino board simulation software
3- Questions and discussions in e-learning

Assessment methods

1. Discussion and exchange of experiences
2. work projects.
3. attendance (In-person) and electronic exams.
4. Duties to share ideas.

D. General and Transferable Skills (other skills relevant to employability and personal development).

The main goal is to know the applications of the Internet of things and the method and programming of dealing with the Arduino boards.

Teaching and Learning Methods

Theoretical lectures and practical labs

Assessment Methods

1. Arduino board design and programming projects (practical).
2. paper exams.
3. discussions.

11. Program Structure				12. Awards and Credits
Level/Year	Course or Module Code	Course or Module Title	Credit rating	
One semester		Internet of thing IoT	32 H	Master Degree Requires ( ) credits

13. Personal Development Planning
Knowing the important applications of the Internet of Things, the method of dealing and programming the Arduino boards.
14. Admission criteria.
Nomination and official acceptance in the light of the average and exam testing and according to the study's acceptance channels and instructions issued by the Ministry of Higher Education and Scientific Research.
15. Key sources of information about the program
Internet of Things A Hands-On Approach by Arshdeep Bahga, Vijay Madisetti

Curriculum Skills Map																			
please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed																			
				Programme Learning Outcomes															
Year / Level	Course Code	Course Title	Core (C) Title or Option (O)	Knowledge and understanding				Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skills relevant to employability and personal development			
				A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**D1**	**D2**	**D3**	**D4**
One semester		Internet of thing IoT	core																

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	College of Computer Science and Mathematics
2. University Department/Centre	Department of Computer Science
3. Course title/code/ lecturers	Internet of Things IoT /One Semester/ / Lec. Dr. Muhaned Thiab Mahdee Al-Hashimi,
4. Modes of Attendance offered	weekly
5. Semester/Year	Semester
6. Number of hours tuition (total)	32 hours
7. Date of production/revision of this specification	7/2/2024
8. Aims of the Course	
1- Describe what IoT is and how it works today	
2- Identify the factors that contributed to the emergence of things	
3- Design and programming of Internet of Things devices	
4- True Internet of Things protocol for communication	
5- Securing IoT Device Elements	
6- Designing an IoT device to work with a cloud boot opportunity.	
7- Transferring IoT data to the cloud and between cloud service patterns.	
8- Define the infrastructure to support image deployments.	
9- Knowing and studying the electronic components that make up the Arduino boards.	
10- Knowing the Arduino IDE	

9· Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Cognitive goals .

A1. The overall goal of this course is to enable you to build an IoT system from the ground up. Note, this is an IoT system; as you'll learn, there's extensive variety insofar as to what an IoT system can be. That said, during this course, you'll learn the various kinds of IoT systems that you'll encounter and build one using representative technologies.

B. The skills goals special to the course.

B1 - Familiarity with how to build an Internet of Things system

B2 - Learn the different types of IoT systems

B3 - Building a system using some simulation software.

B4 - Knowledge of the Arduino IDE

B5 - Programming the Arduino board

Teaching and Learning Methods

1-Theoretical lectures
2- E-Learning
3- Using some simulation software to program the Arduino board
4- Using skills and presenting lectures electronically

Assessment methods

1- Theoretical tests
2- Practical tests
3- Reports, studies and practical application
4- Daily exams

C. Affective and value goals

C1. Building the student's personality and ability to make decisions.

Teaching and Learning Methods

previously mentioned

Assessment methods

previously mentioned

D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)

The main goal is to know the applications of the Internet of things and the method and programming of dealing with the Arduino boards.

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title ***Theoretical and Practical***	Teaching Method	Assessment Method
1	2	Understand the concepts, basics and application	**Introduction about IoT / IoT Background / IoT Definition/ IoT Concept / IoT Framework**	give lectures with explanation and clarification using the computer	Daily exam - and computer application
2	2	Understand the concepts, basics and application	**IoT Characteristic.**	give lectures with explanation and clarification using the computer	Daily exam - and computer application
3	2	Understand the concepts, basics and application	**Physical design of IoT.** **Things in IoT** **IoT Protocols** **Logical design of IoT.** **IoT Functional Blocks.** **IoT Communication Models**	give lectures with explanation and clarification using the computer	Daily exam - and computer application
4	2	Understand the concepts, basics and application	**IoT Enabling Technologies** **Wireless Sensor Network s** **Cloud Computing** **Big Data Analytics** **Communication Protocols** **Embedded Systems**	give lectures with explanation and clarification using the computer	Daily exam - and computer application
5	3	Understand the concepts, basics and application	**IoT levels and deployment templates** **IoT Level-1** **IoT Level-2** **IoT Level-3** **IoT Level-4** **IoT Level-5** **IoT Level-6**	give lectures with explanation and clarification using the computer	Daily exam - and computer application Daily exam - and computer application
6	3	Understand the concepts, basics and application	**IoT & M2M** **M2M** **Differences and Similarities between M2M and IoT**	give lectures with explanation and clarification using the computer	Daily exam - and computer application
7	3	Understand the concepts, basics and application	**SDN and NFV for IoT**	give lectures with explanation and clarification using the computer	Daily exam - and computer application
8	3	Understand the concepts, basics and application	**Domain-Specific IoTs** **• Introduction** **• Home Automation** **• Cities** **• Environment**	give lectures with explanation and clarification using the computer	Daily exam - and computer application
9	3	Understand the concepts, basics and	**Domain-Specific IoTs** **• Energy**	give lectures with explanation and clarification	Daily exam - and computer

		application	• **Retail** • **Logistics** • **Agriculture** • **Industry** • **Health & Lifestyle**	using the computer	application
10	3	Understand the concepts, basics and application	**The building blocks of IoT**	give lectures with explanation and clarification using the computer	Daily exam - and computer application
11	3	Understand the concepts, basics and application	**Basic principles of electronic components** **المبادئ الاساسية للعناصر الالكترونية)** **العناصر الالكترونية.** **المقاومة الكهربائية.** **المكثف.** **الترانزستور .** **منظم الجهد.** **الصمام الثنائي الباعث للضوء.** **الصمام الثنائي.** **افوميتر.**	give lectures with explanation and clarification using the computer	Daily exam - and computer application
12	3	Understand the concepts, basics and application	**Basic principles of electronic components** **المبادئ الاساسية للعناصر الالكترونية)** **راسم اشارة.** **كاوية اللحام.** **خلية شمسية.** **محرك تيار مستمر.** **الدارات الالكترونية المتكاملة.** **الدارات المتكاملة القياسية.** ▪ الدائرة المؤقت الزمني متعدد الاغراض. ▪ الوصل الميكانيكي (المرحل او الريلي). ▪ المتحكمات الدقيقة.	give lectures with explanation and clarification using the computer	Daily exam - and computer application
13	3	Understand the concepts, basics and application	**Introduction to Arduino** **1. Arduino UNO** **2. Arduino Mega** **3. Arduino NANO** **4. Arduino (mini, pro MINI)** **5. Arduino Leonardo**	give lectures with explanation and clarification using the computer	Daily exam - and computer application
14	3	Understand the concepts, basics and application	**6. Arduino Micro** **7. Arduino Due** **8. Arduino Mega ADK** **9. Arduino LilyPad** **10. Arduino Gemma**	give lectures with explanation and clarification using the computer	Daily exam - and computer application
15	3	Understand the concepts, basics and application	**11. Arduino Fio** **12. Arduino Esplora** **13. Arduino Robot** **14. Arduino YUN** **15. Arduino Tian**	give lectures with explanation and clarification using the computer	Daily exam - and computer application
16	3	Understand the concepts, basics and application	**16. Arduino Ethernet** **17. Arduino BT** **18. Arduino M0** **19. Arduino Zero** **20. Arduino MKR ZERO** **Memory of Arduino**		Daily exam - and computer application

11. Infrastructure	
1. Books Required reading:	Internet of Things A Hands-On Approach by Arshdeep Bahga, Vijay Madisetti
2. Main references (sources)	Internet of Things A Hands-On Approach by Arshdeep Bahga, Vijay Madisetti
A- Recommended books and references (scientific journals, reports…).	Internet of Things A to Z Technologies and Applications Edited by Qusay F. Hassan
B-Electronic references, Internet sites…	Different internet References
12. The development of the curriculum plan	
Training courses and the use of the Internet to increase scientific knowledge Taking advantage of the computer to extract clarifications for school students and during seminars in other subjects, update of the curriculum yearly	