



Course Specifications

Course Title:	Selected Topics - Internet of Things
Course Code:	CPCS494
Program:	Bachelor of Science in Computer Sciences
Department:	Computer Sciences
College:	Faculty of Computing and Information Technology
Institution:	Northern Border University, Rafha

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A. Course Identification

1. Credit hours:	3
2. Course type	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input type="checkbox"/> Elective <input checked="" type="checkbox"/>
3. Level/year at which this course is offered: - / -	
4. Pre-requisites for this course (if any): CPCS-351	
5. Co-requisites for this course (if any): Nil	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	45
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify) Project	15
	Total	60

B. Course Objectives and Learning Outcomes

1. Course Description This course learns students about Internet of Things: IoT and what the technical challenges, describes what the enabling technologies of the IoT. The course also discusses the IoT applications and setting the standards of the IoT governance and security.
2. Course Main Objective This course teaches students the impact of IoT and the emerging technologies of IoT.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding:	
1.1	Define the IoT field, life cycles and Applications domains.	K1
2	Skills:	
2.1	Illustrate the Architecture of IoT	S1
2.2	Apply the wireless and Mobile communication.	S3
3	Values:	
3.1	Show the security and privacy challenges of IoT and to find appropriate security/privacy solutions for IoT	V1

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Internet of Things.	6
2	Internet of Things System Life Cycle.	3
3	Internet of Things Product Life Cycle.	3
4	Main Internet of Things Architecture Layers.	8
5	Internet of Things Frameworks.	8
6	Internet of Things Technologies.	7
7	Internet of Things Wireless Network.	7
8	Internet of Things Privacy, Security and Governance.	3
Laboratory Works		
1	Work on a real-time IoT project using Arduino-Uno or Raspberry-pi	15
Total		60

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Define the IoT field, life cycles and Applications domains.	Class / Group discussion, Self-explanation, Observation.	Writing – Oral.
2.0	Skills		
2.1	Illustrate the Architecture of IoT.	Generative learning, Problem-solving, Lab-based learning.	Writing – Oral – Performance – Observation.
2.2	Apply the wireless and Mobile communication.	Scientific research, Problem-solving, Lab-based learning.	Writing – Oral – Performance – Observation
3.0	Values		
3.1	Show the security and privacy challenges of IoT and to find appropriate security/privacy solutions for IoT.	Self-learning, Case studies, Teamwork.	Performance – Observation.

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz-1.	2	2.5
2	Quiz-2.	8	2.5
3	Assignment-1.	2-4	5
4	Assignment-2.	5-7	5
5	Oral questions.	1-12	5
6	Project tasks.	7-12	16
7	Midterm exam.	6	20
8	Project Presentation.	12	4
9	Final exam.	13	40

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

Every instructor has an announced office hours schedule. All students are encouraged to visit the concerned teacher according to the schedule. Students can also use Email address or Blackboard System to seek help or book an appointment.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Buyya, R., & Dastjerdi, A. V. (2016). Internet of Things: Principles and paradigms (1st ed.). Elsevier.
Essential References Materials	Lea, P. (2018). Internet of Things for Architects: Architecting IoT solutions by implementing sensors, communication infrastructure, edge computing, analytics, and security (1st ed.). Packt Publishing.
Electronic Materials	<ol style="list-style-type: none"> 1. Blackboard System: https://lms.nbu.edu.sa/ 2. Northern Border University Electronic Library: https://www.nbu.edu.sa/AR/Deanships/Library_Issues 3. Saudi Digital Library (SDL): https://portal.sdl.edu.sa/english/
Other Learning Materials	Nil

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> • Classroom • Laboratory
Technology Resources (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> • Data Show (Projectors) in Classroom and Laboratory. • Desktop computers • OS: Windows 10 • Software: Arduino IDE, Python 3.0 • Arduino-Uno, ESP8266 Microcontrollers • Raspberry-pi Microcomputer

Item	Resources
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Nil

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students	Indirect
Quality of learning resources	Students	Indirect
Extent of achievement of course learning outcomes	Faculty	Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Computer Sciences Department Council
Reference No.	10
Date	24/2/2022