



National Computing Education Accreditation Council
NCEAC



NCEAC.DOC.001-E

COURSE DESCRIPTION

NAME OF INSTITUTION	Lahore Garrison University
PROGRAM (S) TO BE EVALUATED	Computer Science , Spring 2023

Course Description :

Course Code	CSC383																		
Course Title	Internet of Things																		
Credit Hours	3+0																		
Prerequisites by Course(s) and Topics																			
Assessment Instruments with Weights (homework, quizzes, midterms, final, programming assignments, lab work, etc.)	SESSIONAL (Quizzes, Assignments, Presentations) =25 % Midterm Exam =25 % Final Exam = 50%																		
Course Coordinator	Dr. M. Abubakar Qazi																		
URL (if any)																			
Current Catalog Description																			
Textbook (or Laboratory Manual for Laboratory Courses)	• Internet of Things Principals and Paradigms by Rajkumar Buyya, imprint of Elsevier																		
Reference Material																			
Course Goals	This course is to provide a combined applied and theoretical background in Parallel and Distributed Computing to improve students' learning outcomes: Recall the knowledge related to the Internet of Things and Embedded Systems • Explore the embedded programming for interfacing of sensors and actuators for real world IoT applications. • Develop the understanding of data transmission techniques and protocols for IoT • Articulate the knowledge and understanding related to IoT Cloud Platforms and Cloud computing for IoT.																		
Course Learning Outcomes (CLOs):	<table><tr><td>At the end of the course the students will be able to:</td><td>Domain</td><td>BT Level*</td></tr><tr><td>Recall the knowledge related to the Internet of Things and Embedded Systems</td><td>C</td><td>1</td></tr><tr><td>Explore the embedded programming for interfacing of sensors and actuators for real world IoT applications.</td><td>C</td><td>2</td></tr><tr><td>Develop the understanding of data transmission techniques and protocols for IoT.</td><td>C</td><td>3</td></tr><tr><td>Articulate the knowledge and understanding related to IoT Cloud Platforms and Cloud computing for IoT.</td><td>C</td><td>3</td></tr><tr><td colspan="3">* BT= Bloom's Taxonomy, C=Cognitive domain, P=Psychomotor domain, A= Affective domain</td></tr></table>	At the end of the course the students will be able to:	Domain	BT Level*	Recall the knowledge related to the Internet of Things and Embedded Systems	C	1	Explore the embedded programming for interfacing of sensors and actuators for real world IoT applications.	C	2	Develop the understanding of data transmission techniques and protocols for IoT.	C	3	Articulate the knowledge and understanding related to IoT Cloud Platforms and Cloud computing for IoT.	C	3	* BT= Bloom's Taxonomy, C=Cognitive domain, P=Psychomotor domain, A= Affective domain		
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Topics Covered in the Course, with Number of Lectures on Each Topic (assume 15-week instruction and one-hour lectures)	Week	Lecture	Topics Covered
	Week 1	1	Introduction to Internet of Things
		2	Internet of Thing in Home Automation
	Week 2	3	Internet of Things for Industrial Automation
		4	IoT based smart creatures • Smart IoT based Agri-forms
	Week 3	5	Building blocks for hardware implementation
		6	Human computer interface
	Week 4	7	Embedded systems and its structure
		8	Types of embedded systems
	Week 5	9	Sensors and their Working • Temperature Sensor, • LDR, • RFID, • Humidity etc
		10	Working of PIR motion sensor, ultrasonic sensor, accelerometer, GPS
	Week 6	11	Actuators and their working
		12	Interfacing of sensors and actuators with embedded system (Arduino programing)
	Week 7	13	Serial/Parallel Port Programing using Arduino
		14	Arduino programing for IoT Device integration
	Week 8	1 hours	Mid Term
	Week 9	15	IoT Data Communication Technologies Bluetooth, Wifi, 3G, 4G, 5G, Zigbee
		16	Embedded Programing for Bluetooth Interfacing
	Week 10	17	Mid term exam
		18	Mid term exam
	Week 11	19	Wireless Sensor Networks
		20	Protocols and Architecture for implementation of wireless sensor networks
	Week 12	21	IoT data transmission protocols, data packet handling MQTT and SMQTT protocol
		22	CoAP, Ipv6/ 6LowPAN for IoT data transmission
	Week 13	23	Data Storage and Data Analysis for IoT applications Importance of Data security and Integrity for IoT applications IoT data encryption
		24	Implementation of home automation using Bluetooth and Arduino programing
	Week 14	25	Cloud computing and IoT Clouds Microsoft Azure IoT Suite Amazon Web Services IoT IBM Watson IoT Google Cloud IoT
		26	SCADA Systems and Fourth Industrial Revolution(Industry 4.0)
	Week 15	27	Industrial IoT on Google Cloud Platform/ Adafruit IoT
		28	Industrial IoT on Google Cloud Platform/ Adafruit IoT
	Week 16	29	Implementation of Automation using Google Assistant and Adafruit Cloud
		30	Implementation of Automation using Google Assistant and Adafruit Cloud
	Week 17	2 hours	Final Term
Laboratory Projects/Experiments Done in the Course	IOT based automation projects		
Programming Assignments Done in the Course	Arduino programing		

Instructor Name	Dr. M. Abubakar Qazi
Instructor Signature	
Date	