



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 2022

Course Description : The Internet of things course is designed to Acquire knowledge related to the Internet of Things and Embedded Systems. To learn 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. Develop knowledge and understanding related to IoT Cloud Platforms and Cloud computing for IoT.

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. Waqar Azeem																		
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	The Goals the course is: CLO1: Acquire knowledge related to the Internet of Things and Embedded Systems CLO2: To learn the embedded programming for interfacing of sensors and actuators for real world IoT applications. CLO3: Develop the understanding of data transmission techniques and protocols for IoT. CLO4: Develop 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>Acquire knowledge related to the Internet of Things and Embedded Systems</td><td></td><td></td></tr><tr><td>To learn the embedded programming for interfacing of sensors and actuators for real world IoT applications</td><td></td><td></td></tr><tr><td>Develop the understanding of data transmission techniques and protocols for IoT</td><td></td><td></td></tr><tr><td>Develop knowledge and understanding related to IoT Cloud Platforms and Cloud computing for IoT.</td><td></td><td></td></tr><tr><td>* BT= Bloom's Taxonomy, C=Cognitive domain, P=Psychomotor domain, A= Affective domain</td><td></td><td></td></tr></table>	At the end of the course the students will be able to:	Domain	BT Level*	Acquire knowledge related to the Internet of Things and Embedded Systems			To learn 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			Develop knowledge and understanding related to IoT Cloud Platforms and Cloud computing for IoT.			* 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	Sensors and their Working • Temperature Sensor, • LDR, • RFID, • Humidity etc
		6	Working of PIR motion sensor, ultrasonic sensor, accelerometer, GPS
	Week 4	7	Actuators and their working
		8	Introduction of Embedded systems for IoT Introduction to embedded programing
	Week 5	9	Interfacing of sensors and actuators with embedded system (Arduino programing)
		10	Serial/Parallel Port Programing using Arduino
	Week 6	11	Arduino programing for IoT Device integration
		12	IoT Data Communication Technologies Bluetooth, Wifi, 3G, 4G, 5G, Zigbee
	Week 7	13	Embedded Programing for Bluetooth Interfacing
		14	Implementation of home automation using Bluetooth and Arduino programing
	Week 8	1 hours	Mid Term
	Week 9	15	Midterms
		16	Midterms
	Week 10	17	Wireless Sensor Networks
		18	Protocols and Architecture for implementation of wireless sensor networks
	Week 11	19	IoT data transmission protocols, data packet handling MQTT and SMQTT protocol
		20	CoAP, Ipv6/ 6LowPAN for IoT data transmission
	Week 12	21	Data Storage and Data Analysis for IoT applications Importance of Data security and Integrity for IoT applications IoT data encryption
		22	Introduction to Raspberry Pi Platform and Python Programming for the Raspberry Pi
	Week 13	23	Cloud computing and IoT Clouds Microsoft Azure IoT Suite Amazon Web Services IoT IBM Watson IoT Google Cloud IoT
		24	SCADA Systems and Fourth Industrial Revolution(Industry 4.0)
	Week 14	25	Industrial IoT on Google Cloud Platform/ Adafruit IoT
		26	IoT web Services, IFTTT
	Week 15	27	Implementation of home/industrial Automation using IFTTT
		28	Implementation of Automation using Google Assistant and Adafruit Cloud
	Week 16	29	Using Mobile Sensors and Services through IoT clouds and web services
		30	IoT Project presentations and evaluation
	Week 17	2 hours	Final Term
Laboratory Projects/Experiments Done in the Course			
Programming Assignments Done in the Course			

Instructor Name	Dr. Waqar Azeem
Instructor Signature	
Date	