Department of Computer Applications
National Institute of Technology, Tiruchirappalli

Course Plan - Part I

Name of the programme and specialization	M. Sc. (Computer Science)		
Course Title	Internet of Things		
Course Code	CAS 7C2	**No. of Credits**	3
Name of Faculty	Dr. Mrs. B. Janet	**Session**	July 2019
PAC Chairman	Dr. S. Sangeetha	E-mail	sangeetha@nitt.edu
E-mail	janet@nitt.edu	**Telephone No.**	0431-2503741
Course Type	Elective	**Office**	Lyceum 108
Course moodle site	https://moodle.nitt.edu/moodle/course/view.php?id=10		

Syllabus

Internet of Things – Overview, Technology of the Internet of things, enchanted objects, Design Principles for connected devices, Privacy, Web thinking for connected devices.

Writing Code: Building a program and deploying to a device, Writing to Actuators, Blinking LED, Reading from sensors, Light Switch, Voltage Reader, Device as HTTP Client, HTTP, Push verses Pull.

Pachube, Netduino, Sending HTTP Requests, The simple way, the efficient way

HTTP: Device as HTTP Server, Relaying messages to and from the Netduino, Request handlers, WebHtml, Handling Sensor Requests, Handling Actuator Requests.

Going Parallel: Multithreading, Parallel Blinker, prototyping online components, Using an API, From Prototypes to reality, Business Models, ethics, privacy, disrupting control, crowd sourcing.

Reference books

1. Adrain McEwen and Hakim Cassimally, “Designing the Internet of Things”, John Wiley & Sons, 2013.
2. Cuno Pfister, “Getting Started with the Internet of Things: Connecting Sensors and Microcontrollers to the cloud”, Maker Media, 2011.

Course Objectives

- To understand the fundamentals of internet of things.
- To acquire skills to program the embedded devices and connecting them to the web and cloud.

Course Outcome	Aligned Programme Outcome (PO)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Able to Program embedded devices	H	H	H	L	M	L	M	L	L	L	L	H
Program simple actuators and sensors	H	H	H	L	M	L	H	M	L	L	L	H
Build client programs that push sensor readings from a device to a web service	H	M	M	L	M	L	M	M	L	L	L	H

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COURSE PLAN – PART II

COURSE OVERVIEW

Class lectures and class exercise with self-learning videos will form the primary teaching activity. Lecture material will address the intended learning objectives, and loosely follow the readings as specified in the course Moodle site. The lecture material will be made available before the class. The lectures are meant to be interactive, where learning takes place through interactive discussion in class. The Moodle site will be available for detailed content dissemination and discussion inside and outside the classroom, between students and with the teacher. Student engagement in class and in the course Moodle site will count towards assessment of student participation that has assessment weightage.

Guest Lectures

Structured lectures will be supplemented by guest lectures by practitioners and researchers from industry and academia. These will serve to show the practical relevance of the course content and also expose the students to the open problems of research.

COURSE TEACHING AND LEARNING ACTIVITIES

Week	Mode of Delivery	Topics	Readings
1.	Classroom activity	Introduction	**Refer Moodle Course Site**
		Technology	
		Sensors	
2.	Classroom activity	Privacy	
		Security	
		Connected devices	
3.	Classroom activity	Programming	
		Reading from sensors	
		Standards	
4.	Classroom activity	Node Structure: Sensing, Processing, Communication, Powering	
		Networking	
		Layer/Stack architecture	
5.	Classroom activity	Signal Processing	
		Analytics	
6.	Classroom activity	Multithreading	
		Prototyping	
7.	Classroom activity	Project based on Raspberry pi	
8.	Classroom activity	Project using MIT App Inventor	
9.	Classroom activity	Project based on Smartphones	
10.	Classroom activity	Project using Open source Tools	

All relevant material will be available in the course moodle site. Classroom activity includes lecture, tutorial, quiz, simulation exercise, laboratory exercise, mini-project, group task and seminar.

The assessment details for this course are given below. The assessment will be done for a total of 100 marks.

COURSE ASSESSMENT

Sl.No.	Mode of Assessment	Portions	Week/Date	Duration in Minutes	Weightage (%)
1.	Test – 1	Unit I	4th week	30	10
2.	Test – 2	Unit II	6th week	30	10
3.	Project – 1	Unit III	8th week	30	15
4.	Project – 2	Unit IV and V	10th week	30	15
5.	CPA	Compensation Assessment*	11th week	30	10
6.	Final Assessment	All Units	November	120	50
Total					100

COURSE EXIT SURVEY

- The students may give their feedback at any time to the course teacher or through a message in moodle which will be duly addressed.
- The students may also give their feedback during Class Committee meeting and fill up the feedback form in moodle site at the end of each test.

COURSE POLICY

Classroom Behavior

Ensure that the course atmosphere, both in the class, outside and on the online forum, is conducive for learning. Participate in discussions but do not dominate or be abusive. Be considerate of your fellow students and avoid disruptive behavior.

Exam policy

Each student is required to take all exams at the scheduled times. All exceptions must be cleared with the professor prior to the exam time. Exams missed for insufficient reason and without being cleared with the professor prior to the exam time will be assigned a score of zero.

Assignments

All assignments are due on or before the mentioned date and time and is to be uploaded on the course moodle site.

Late assignments

Late submissions are not accepted.

Attendance

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.

Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

Academic Honesty

i) Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.

ii) Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.

iii) The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

FOR APPROVAL		
28/8/19	28/8/19.	S.R. Balasundaram
(Dr. S. Sangeetha)	**(Dr. Mrs. B. Janet)**	**(Dr. S. R. Balasundaram)**
PAC Chairperson	**Course Faculty**	**Head**