SDSC4021: ADVANCED INTERNET OF THINGS

Effective Term
Semester A 2022/23

Part I Course Overview

Course Title
Advanced Internet of Things

Subject Code
SDSC - School of Data Science
Course Number
4021

Academic Unit
School of Data Science (DS)

College/School
School of Data Science (DS)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
SDSC3018 Introduction to Internet of Things

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract
The Internet of Things, better known as IoT, represent a huge technological trend driving by the advancements of sensors, internet, information, data, and mobile usage. This course will coves some of the new challenges and issues to arise.

We will consider aspects of systems implementation and focus on both theoretical tools for the analysis of data as well as the vulnerabilities that arise because of the overall interconnectedness. We provide students with a comprehensive understanding of IoT by focussing on both the technical viewpoints as well as the systems implementation viewpoint and the societal impact.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Apply the technical side of an IoT system	15		x	x
2	Describe the society implications of IoT and the vulnerabilities of interconnectedness	40		x	
3	Describe and outline a implementation plan for a IoT technology architecture	15	x		
4	Ability to analyze and visualize the data from the IoT system	15	x	x	
5	Recognize how data and IoT can be used to drive innovation.	15	x		

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Teaching and Learning Activities (TLAs)

	TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	Weekly lectures with group discussion and Q&A sessions and small group activities to test concepts from the lecture	2, 3, 5	2 hours/week
2	Lab Work	Laboratories during which the students develop their own IoT system and present their findings to the group. (whole semester project)	1, 2, 4	1 hour/week

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Project	1, 2, 4	50	
2	Presentation showcasing group project	1, 3, 5	10	

Continuous Assessment (%)

60

Examination (%)

40

Examination Duration (Hours)

2

Assessment Rubrics (AR)

Assessment Task

Small group project

Criterion

Written work and understanding of subject matter

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Implementation of IoT system

Criterion

Participation, and written work, IoT System

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
Presentation

Criterion
Oral presentation

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
Exam

Criterion
Subject matter understanding

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Internet of Things
Data driven and innovative thinking
System analysis and understanding
IoT architecture
Business case for IoT
Societal impact of IoT
Interconnectedness and society
IoT applications in Smart City

Reading List

Compulsory Readings

	Title
1	Lecture notes

Additional Readings

	Title
1	Nil