SDSC3018: INTRODUCTION TO INTERNET OF THINGS

Effective Term
Semester A 2024/25

Part I Course Overview

Course Title
Introduction to Internet of Things

Subject Code
SDSC - School of Data Science
Course Number
3018

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
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

The 21st century is an era of internet, information, and data. The Internet of Thing (IoT) is the system of interrelated physical devices (such as vehicles, homes appliances and other items) embedded with electronics, sensors and software that provide the ability to transfer data over a network without human-to-computer interaction. This course provides and introduction to IoT. Students will learn about the integration of sensors in an IoT system and will set up their own IoT device to collect and share data. The Internet of Things are devices with sensors, processing ability, and software that exchange and process data with other devices and systems. This course introduces the foundations and practices of IoT networking and computing. Students will learn the principles and techniques associated with computer networks and organizations and their applications to IoT. Students will also gain knowledge to set up their own IoT solutions.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Identify and explain the components and architecture of IoT	20	x	x	
2	Explain and analyse networking protocols and computing architectures for IoT and contrast them to general-purposed computers	40		x	x
3	Describe and utilize development chains to implement IoT systems	10	x	x	
4	Apply IoT concepts and design a small IoT system	30	x	x	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.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	Students will engage in formal lectures about the principles, techniques, and development tools of IoT networking and computing.	1, 2, 3	3 hours/week
2	Group project	Students will work in groups to develop IoT-based solutions to real-world applications. They will also present their solutions and evaluate works by other peers.	1, 2, 3, 4	After classes; presentation in class in the last week

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Mini-Test	1, 3	15	Qualitative questions to assess how well the students have learned fundamental concepts and methods in overall architecture and individual components of IoT
2	Group Project Topic: Implementation of an IoT system	1, 2, 3, 4	35	Group assessment that enables students to design and implement IoT-based solutions for practical applications

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Additional Information for ATs

Examination:
Qualitative and quantitative questions to see how far students have achieved their intended learning outcomes

Note: To pass the course, apart from obtaining a minimum of 40% in the overall mark, a student must also obtain a minimum mark of 30% in both continuous assessment and examination components.

Assessment Rubrics (AR)

Assessment Task

Mini-Test

Criterion

Ability to identify and clarify the fundamental architectures and components of IoT systems.

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
Group Project

Criterion
Ability to apply principles and techniques of IoT networking and computing in designing functional IoT systems.

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
Ability to analyse and evaluate IoT networking protocols and data processing workflows.

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
- Computer networks and IoT networking
- Computer architecture and IoT computing
- IoT system development

Reading List

Compulsory Readings

	Title
1	Lecture notes

Additional Readings

	Title
1	Nil