

SDSC3019: INTRODUCTION TO NETWORKED LIFE AND DATA SCIENCE

Effective Term

Semester A 2023/24

Part I Course Overview

Course Title

Introduction to Networked Life and Data Science

Subject Code

SDSC - School of Data Science

Course Number

3019

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

This course covers fundamental techniques behind everyday networked applications and services used by millions of people worldwide, including Google search, YouTube, and Cellular service. These techniques include, but not limited to, optimization, algorithm, and data analytics.

Course Intended Learning Outcomes (CILOs)

| CILOs | | Weighting (if DEC-A1 DEC-A2 DEC-A3 app.) | | | |
|-------|---|--|---|---|---|
| 1 | Ability to understand the fundamentals of exemplary networked applications and services | 30 | x | | |
| 2 | Ability to understand how data science may enable and enhance these applications and services | 30 | x | | |
| 3 | Ability to compare and analyze different techniques behind these applications and services | 20 | x | x | |
| 4 | Ability to apply key analysis and techniques to solve practical problems | 20 | 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.

Teaching and Learning Activities (TLAs)

| TLAs | | Brief Description | CILO No. | Hours/week (if applicable) |
|------|---------------|--|------------|--|
| 1 | Lecture | Learning through teaching is primarily based on lectures and demonstrations. | 1, 2, 3, 4 | 3 hours lecture in the teaching weeks, 27-30 hours in total |
| 2 | Class-project | The students are expected to identify and tackle practical problems in networked systems, ideally with data science related techniques learned from the course. The students are expected to write a report and give two presentations. This learning activity will be mainly student-led but with the instructor's structural guidance. | 1, 2, 3, 4 | 9-12 hours for in-class presentation and final presentation, as well as after-class project activities |

Assessment Tasks / Activities (ATs)

| ATs | CILO No. | Weighting (%) | Remarks (e.g. Parameter for GenAI use) |
|--|------------|---------------|---|
| 1 Quizzes or Homework Review reports of selected papers will show how well the students can understand the concepts, fundamentals, and techniques of networked applications and services, as well as the role of data engineering. Quiz or homework questions are designed to see how well the students have mastered the concepts, fundamentals, and techniques of networked services, as well as data engineering. | 1, 2 | 30 | Up to 5 homework or two quiz problems per lecture will be assigned. |
| 2 Mini-Project The project provides students chances to demonstrate the understanding and application of the basic concepts, fundamentals, and techniques of networked application and services and data engineering in practical systems. | 1, 2, 3, 4 | 20 | |
| 3 Mini-Project Presentation The project provides students with chances to demonstrate how well they have achieved their intended learning outcomes. | 1, 2, 3, 4 | 20 | |

Continuous Assessment (%)

70

Examination (%)

30

Examination Duration (Hours)

2

Additional Information for ATs

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

1. Homework or quiz

Criterion

Ability to understand the basic concepts, fundamentals, and techniques of networked applications and services, as well as the role of data engineering.

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

2. Mini-Project Report

Criterion

Ability to demonstrate the understanding and application of the basic concepts, fundamentals, and techniques of networked application and services and data engineering in practical 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

3. Mini-Project Presentation

Criterion

Ability to demonstrate how well the intended learning outcomes are achieved.

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

Networks, data analytics, optimization, data engineering

Reading List

Compulsory Readings

| Title | |
|-------|--|
| 1 | Mung Chiang, “Networked Life: 20 Questions and Answers” , Cambridge University Press, 2012 |

Additional Readings

| Title | |
|-------|-----|
| 1 | Nil |