

SDSC6014: NETWORKED LIFE AND DATA SCIENCE

Effective Term

Semester A 2025/26

Part I Course Overview

Course Title

Networked Life and Data Science

Subject Code

SDSC - Data Science

Course Number

6014

Academic Unit

Data Science (DS)

College/School

College of Computing (CC)

Course Duration

One Semester

Credit Units

3

Level

P5, P6 - Postgraduate 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, Cellular service, and Blockchain. These techniques include, but not limited to, optimization, algorithm, security, data analytics, and machine learning. How data science and related subject enables and enhance these essential networked applications and services will also be discussed.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if DEC-A1 DEC-A2 DEC-A3 app.)			
1	Describe the fundamentals of exemplary networked applications and services	30	x		
2	Describe how data science may enable and enhance these applications and services	30	x		
3	Compare and analyze different techniques behind these applications and services	20	x	x	
4	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.

Learning and Teaching Activities (LTAs)

LTAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Students will engage in formal lectures to gain knowledge about various networked applications in daily life and the fundamental challenges and data-science related solutions behind	1, 2, 3, 4	27-30 hours in total

2	Class-project	The students will identify and tackle practical problems in networked systems, ideally with data science related techniques learned from the course. The students will 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
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Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks ("- " for nil entry)	Allow Use of GenAI?
1 Paper Reading, Quizzes, or Homework: Review reports of selected papers will show how well the students can understand the concepts, fundamentals, and techniques of networked application 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	25	Up to 5 papers or homework will be assigned or two quiz problems per lecture will be assigned. AI tools are not allowed for end-of-lecture quizzes	No

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	25	-	Yes
3	Mini-Project Presentation: The project provides students chances to demonstrate how well they have achieved their intended learning outcomes.	1, 2, 3, 4	25	-	Yes

Continuous Assessment (%)

75

Examination (%)

25

Examination Duration (Hours)

2

Minimum Continuous Assessment Passing Requirement (%)

30

Minimum Examination Passing Requirement (%)

30

Assessment Rubrics (AR)**Assessment Task**

Paper Reading (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to understand and the basic concepts, fundamentals, and techniques of networked application 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

Mini-Project Report (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

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

Mini-Project Presentation (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

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

Assessment Task

Examination (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to understand and apply the basic concepts, fundamentals, and techniques of networked application 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

Paper Reading (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

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

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic to moderate

Failure

(F) Not even reaching marginal levels

Assessment Task

Mini-Project Report (for students admitted from Semester A 2022/23 to Summer Term 2024)

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) Significant

Marginal

(B-, C+, C) Basic to moderate

Failure

(F) Not even reaching marginal levels

Assessment Task

Mini-Project Presentation (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

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

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic to moderate

Failure

(F) Not even reaching marginal levels

Assessment Task

Examination (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

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

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic to moderate

Failure

(F) Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Networks, data analytics, machine learning, 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	Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System", 2008