COURSE DETAIL

QUANTUM DATA SCIENCE
Country Korea, South
Host Institution Yonsei University
Program(s) Yonsei University
UCEAP Course Level Graduate
UCEAP Subject Area(s) Statistics
UCEAP Course Number 205
UCEAP Course Suffix
UCEAP Official Title QUANTUM DATA SCIENCE
UCEAP Transcript Title QUANTUM DATA SCI
UCEAP Quarter Units 4.50
UCEAP Semester Units 3.00

Course Description

This course covers the essence of quantum computing and various quantum machine learning techniques. Quantum computing has the potential to outperform classical computing and to solve problems that were believed to be intractable otherwise. With rapid advances in quantum technology, current technology is expected to be disrupted in many ways. Quantum computing opens up tremendous opportunities for data science in the big data era where computational power is of critical importance.

This course equips students with theoretical backgrounds to be able to apply the principles of quantum computing in solving various challenges of modern data science problems. Topics include Introduction to quantum data science & quantum machine learning, Machine learning basics & classical information, Quantum mechanics & quantum information, Circuit model of quantum computation & reversible computing, Black-box model of computation & related quantum algorithms, Quantum phase estimation & Quantum Fourier transform, Unstructured search & quantum amplitude estimation, Quantum linear systems solver & quantum support vector machine, Quantum kernel method, and Quantum neural network.

Prerequisites: Linear algebra, calculus, probability theory and statistics, Quantum mechanics, Python or Matlab (or similar programming skills)

Language(s) of Instruction
English

Host Institution Course Number
STA9075

Host Institution Course Title
QUANTUM DATA SCIENCE

Host Institution Course Details

Host Institution Campus

Host Institution Faculty

Host Institution Degree
Host Institution Department
Course Last Reviewed 2025-2026

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