# COURSE DETAIL

| INTRODUCTION TO DATA PROCESSING AND REPRESENTATION |
| --- |
| **Country**<br>Israel |
| **Host Institution**<br>Israel Institute of Technology, Technion/Neubauer |
| **Program(s)**<br>Technion-Institute of Technology |
| **UCEAP Course Level**<br>Upper Division |
| **UCEAP Subject Area(s)**<br>Computer Science |
| **UCEAP Course Number**<br>105 |
| **UCEAP Course Suffix** |
| **UCEAP Official Title**<br>INTRODUCTION TO DATA PROCESSING AND REPRESENTATION |
| **UCEAP Transcript Title**<br>INTRO DATA PROCESS |
| **UCEAP Quarter Units**<br>4.50 |
| **UCEAP Semester Units**<br>3.00 |

**Course Description**

This course focuses on the basic methods for processing and analyzing data with deterministic and probabilistic tools. It is a preliminary course for deep learning and convolutional neural networks. The course explains how to digitize signals and data in a computer, how to represent them in different bases, and how to use these representations efficiently for various signal processing tasks. Topics include signal quantization and sampling for bit-allocation, system and data representations including but not limited to the Fourier representation, optimality of the Fourier representation, functional maps, convolutions, compression, dimensionality reduction, principal component analysis, restoration of blurred deterministic or randomly distributed data with or without random noise via filtering. Signals and systems are analyzed in the continuous and discrete settings.

**Language(s) of Instruction**
English

**Host Institution Course Number**
236201

**Host Institution Course Title**
INTRODUCTION TO DATA PROCESSING AND REPRESENTATION

**Host Institution Course Details**
https://www.graduate.technion.ac.il/Subjects.Eng/?Sub=236201

**Host Institution Campus**

**Host Institution Faculty**
Graduate School

**Host Institution Degree**
Joint

**Host Institution Department**
Computer Science

**Course Last Reviewed**
2021-2022

Print