Course Description

In the course we will learn the following topics

- The digital transformation and Big data: How one enables the other
- How the digital transition affects various industries
- Digital representation of data
  - Numerical data representation
  - Textual data representation
  - Image data representation
  - Video data representation
  - Formats and standards in digital data representation
- Digital data processing
  - The evolution of computing technology and its effect on business world
  - Introduction to computer hardware
The business world is in the middle of a digital transformation. Both digital technology and data are at the center of this transformation, and are becoming critical elements for managing a successful business in the digital era.

In this course we will discuss how digital technology is used to collect, store and process data and translate it into a business tool. We will also analyze the effect of the transition into a digital world on the business world in the 21st century.

The course will provide the students the technical knowledge which will enable them to take part in the digital transformation, and to be managers/entrepreneurs in the digital world of the 21st century.

Grading

Students are required to attend all classes, and to submit all home assignments (there will be several home assignments). As part of the home assignments the students will have to prepare a presentation on a digital product/service and present it in class.

At the end of each set of classes there will be an interactive quiz on the content of these classes and the student will have to do it at the time set for the interactive quit.

At the end of each semester there will be a mini project (related to the topics discussed during the semester).

**Course Grading Criteria:**

- Semester A mini-project - 25%
- Semester B mini-project – 25%
- Interactive quizzes – 25%
- Home assignments - 25%

Learning Outcomes

**Semester A:**
An introduction lecture:
Lecture 1: data is the "oil" for the digital transformation

Series of lectures on data representation in the digital world
Lecture 2: the binary system and numeric data representation
Lecture 3: textual data representation and the transition from print to digital
Lecture 4: visual data representation (part 1 – Resolution)
Lecture 5: visual data representation (part 2 – Digital images)
Lecture 6: visual data representation (part 3 – Digital video)
Lecture 7: digital data compression
Lecture 8: multi-media standards

Series of lectures on the digital computer structure
Lecture 9: the stored program concept and the digital computer structure (and input & output devices)
Lecture 10: Storage technologies (part 1)
Lecture 11: Storage technologies (part 2)
Lecture 12: Computer memory (RAM) & CPU
Lecture 13: Computer bus and additional components

Semester B:

Series of lectures on the Software
Lecture 1: Introduction to VIC programing (VIC instructions-set)
Lecture 2: VIC programing
Lecture 3: from machine code to modern software applications
Lecture 4: software compilation modes and runtime environments
Lecture 5: Commercial software ver. Open Source Software (OSS)

Series of lectures on the Operating System (OS) & Virtualization
Lecture 6: Introduction to the OS and Hardware abstraction
Lecture 7: Multi-processing mechanism
Lecture 8: Memory management
Lecture 9: Disk & File management
Lecture 10: OS importance from business perspective
Lecture 11: Virtualization (part 1)
Lecture 12: Virtualization (part 2)
Lecture 13: IaaS (Infra-structure as a service)

Note: the above plan is tentative and may be changed during the course

📖 Lecturer Office Hours

You can always email me (dmovshovitz@gmail.com) and I will try to answer ASAP, or will set a zoom meeting to discuss.

👨‍🏫 Tutor Office Hours

N/A

⏰ Teaching Assistant

If required will be given during the course

💬 Reading List

There is no text book for the course as it will cover many different subjects.

The presentations used in the course lectures will be detailed and should be used as a basis for learning the topics learned in the course. The lectures presentations will be uploaded to the course web site before each lecture.

In addition, I will upload to the course web site additional research papers and other relevant material, and the students are asked to read these papers as preparation to the lectures.