**The Program of Medical Engineering  
Syllabus of Course** **Healthcare Information Systems, 50208**

**Academic Year: Spring 2022**

**No. of course hours**: 3 lecture hours, 3academic points

**Prerequisites:**

Data bases and Data Warehouse Systems, introductory programming course.

**Objectives**

The course will provide an overview of healthcare informatics challenges and solutions, including advanced trends in healthcare software solutions.

Students will build a platform for remote data acquisition. The platform includes both server communication for controlling a relational healthcare database, and front-end client for healthcare data collection, data queries and decision-supporting alerts.

**Abstract**

With the growing mass of electronic healthcare records, healthcare data science has been spotted as the next field for potential technological breakthroughs. The purpose of this course is to provide introduction to fundamental concepts in the field, to provide fundamental tools for designing, controlling, and mining healthcare data. The course is meant to be a project-oriented taste of the healthcare data world.

**Academic Outcomes**

The students will build an application connected to a server’s relational database. Students will build a desktop front-end application using object-oriented python programming. The application will control and query a relational database that will also be built and integrated using python.

**Lecture topics by weeks \***

|  |  |
| --- | --- |
| Topic | Week |
| Introduction: Biomedical Data - Acquisition, Storage, and Use | 1-2 |
| Healthcare Coding Systems and thesaurus | 3 |
| Uses cases of Electronic Healthcare Systems | 4 |
| Building relational DB for healthcare needs:   * Patient-oriented architectures * Public healthcare data records * Research-oriented systems | 5-8 |
| Building user-interface for data acquisition:   * Data controller types * User interface architecture and design * Data communication with the server - local and remote data control * Data queries and mining via front-end communication * Front-end data representations and alert system | 9-12 |
| Advanced topics in building a system for remote controlling of healthcare data, projects troubleshooting | 13-14 |

**Tutorials / Labs topics by weeks\***

|  |  |
| --- | --- |
| Topic | Week |
| Introduction: Biomedical Data - Acquisition, Storage, and Use | 1-2 |
| Case-studies analysis through healthcare-coding dictionaries | 3 |
| Object-oriented programming for healthcare data | 4 |
| Building a server and relational DB using object-oriented programming | 5-8 |
| Building user-interface for remote data acquisition using modular object-oriented programming   * Data collection * Data queries and front-end representations * Communication with the server - local and remote data control * Data-driven alerting system | 9-12 |
| Advanced topics in remote controlling of healthcare data, projects troubleshooting | 13-14 |

\* The order of the topics can be changed at the lab instructor's / tutor's discretion.

\* Weekly sessions are intended to be 1.5 academic hours of frontal lecture, and 1.5 academic hours of programming practice on the same topic.

\* There may be exceptional lectures where weekly session will be dedicated to frontal lecture, and the following week will be dedicated to practice.

**Textbooks and Recommended Bibliography**:

* Edward H. Shortliffe and James J. Cimino, Biomedical

Informatics - Computer Applications in Health Care and Biomedicine (4th edition)

* Healthcare information systems, by Karen A. Wager, Frances Wickham Lee and John P Glas

**On-line** **supporting materials** will be provided during the course at the course’s moodle site: <http://moodle.afeka.ac.il/>

**Course Coordinator:**

Dr. Hadas Lapid

[hadasl@afeka.ac.il](mailto:hadasl@afeka.ac.il)

reception hours will be announced in class.

**Course Requirements and Calculation of Final Grade:**

|  |  |  |
| --- | --- | --- |
| **Project** | **Homework Assignments**  **(3 Assignments, 10% each)** | **Task Type** |
| 70% | 30% | **Percentage of Final Grade** |

In order to pass the course, students **must fulfill the following conditions:**

**1. Final weighted course grade of at least 60 (taking into consideration all of the above course requirements).**

**2. Attendance according to the attendance requirement. (see section regarding attendance)**

**Language of teaching the course:**

The course will be taught in Hebrew

lecture notes and assignments will be in English.

Supporting materials will be in English

**Class Attendance:**

Yes