



FUNDAMENTALS OF MEDICAL INFORMATICS	
Enrollment year	2018/2019
Academic year	2019/2020
Regulations	DM270
Academic discipline	ING-INF/06 (ELECTRONIC AND INFORMATION BIOENGINEERING)
Department	DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING
Course	BIOENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	2°
Period	1st semester (30/09/2019 - 20/01/2020)
ECTS	6
Lesson hours	107 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	BELLAZZI RICCARDO (titolare) - 3 ECTS SACCHI LUCIA - 3 ECTS
Prerequisites	Basic informatics and programming skills
Learning outcomes	<p>The course aims to provide the basic elements of Medical Informatics as a discipline. Medical Informatics can be seen as the "logic" of healthcare, or as the rational study of the entire process of patient care. Students will then learn the basic elements of healthcare organization in Italy and abroad and the problems related to the representation of medical information. The course will develop along two lines: the study of issues related to the exchange of data and information in health care information systems and finally on learning MATLAB, and XML. At the end of the course the student will have acquired the basic skills necessary to understand what are the tasks and activities of information systems in health care</p>

Elements of health care organization
The organization of health care in Italy
The reimbursement of hospital services
The DRG system
Indicators of efficiency and effectiveness
Representing information
Coding Systems: ICD9, ICD9-CM, ICD10, ATC, LOINC
Terminology: SNOMED
meta-thesaurus: UMLS
Standards: HL7
Information systems and computer networks in healthcare
The structure and key elements of health information systems
UML diagrams, use case, activity and sequence
Computer Networks
The ISO / OSI model
Ethernet, TCP / IP
Internet and the HTTP protocol
Security and privacy: elements of legislation
Digital signature and HTTPS
Matlab
Matlab: a software environment for numerical computation and engineering
Matlab as a programming language, toolboxes
Vectors and matrices, cell arrays, structures
Control structures
Functions
Reading and writing files
Development of graphical user interfaces
Writing and Reading XML documents in Matlab
XML
Introduction to XML and Markup Languages ??in
Documents well formed
Introduction to DTD
Valid documents
Using XML editor
XML Parsers
XML Schemas
Practical Activities with Matlab
Students will work in groups to program a Matlab application with a graphical interface for the management of hospital data. The available files are samples of real hospitals data.

Teaching methods

Lectures (hours/year in lecture theatre): 30
Practical class (hours/year in lecture theatre): 0
Practicals / Workshops (hours/year in lecture theatre): 50

**Recommeneded or required
readings**

Slides and notes available at: <http://elearning2.unipv.it/ingegneria/>

D. Comer. Internet e Reti di calcolatori. Addison-Wesley.

Joe Fawcett, Danny Ayers, Liam R. E. Quin. Beginning XML, 5th Edition (ebook).

Dan Pilone, Neil Pitman. UML 2.0 in a Nutshell. O'Reilly.

Written exam. Software projects.

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