ipb
INSTITUTO POLITÉCNICO
DE BRAGANÇA

Course Unit	Informatics applied to Health			Field of study	Health	
Master in	Applied Health Sciences - Biotechnology			School	School of Health	
Academic Year	2023/2024	Year of study	1	Level	2-1	ECTS credits	3.5
Type	Semestral	Semester	1	Code	5055-669-1107-00-23	

Workload (hours)	94,5	Contact hours	T	-	TP	-	PL	-	TC	-	S	-	E	-	OT	-	O	42

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s)	Sandra Carvalho Dias

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Implement SQL queries (Structured Query Language) to relational Database models of type DQL (Data Query Language).
2. Recognize the main advances in information technologies in the health services.
3. Use communication standards for DICOM medical imaging.
4. Identify the main applications of Artificial Intelligence in healthcare.
5. Know the potential of e-Heath and m-Heath technologies.

Prerequisites

Before the course unit the learner is expected to be able to:
1. Mastering basic concepts of using computer equipment as an end user.
2. Demonstrate skills in handling Microsoft Windows operating systems.

Course contents

Databases: Relational data model, SQL language, Database design for healthcare. Information Technologies in Health. Communication standards for medical imaging – DICOM. Artificial intelligence. e-Health and m-Health: Definitions; Fundamental concepts; Standards; Case studies; Current scenario in EU and Portugal.

Course contents (extended version)

1. Databases
   - Database technologies
   - MySQL tools
   - Conditions & Operators / Wildcards
   - CRUD (Create, Read, Update and Delete) Commands
   - Alias / Join / Union / Intersect / Minus
2. Computer applications
   - Digitization of health services
   - Emerging Technologies: Internet of Things (IoT), Big Data and Cloud Computing
   - Mobile applications and services
   - Medical robotics and Artificial Intelligence
   - Information Security
3. Medical image communication standards
   - Ethics and legal nature in digital manipulation of patient data
   - Picture archiving and communication system - PACS
   - Digital Imaging and Communications in Medicine (DICOM)
   - Services and Formats
   - Legislation and ethics in image handling
   - Data representation and security
   - Registration, transmission and printing
   - DICOM Viewers
   - Analysis of medical images in the Cloud using DICOM viewers
4. Artificial Intelligence
   - Basic concepts of artificial intelligence
   - Learning Algorithms
   - Neural Networks
   - Study of a framework – Orange Data Mining
   - Training of learning machines
5. e-Health
   - Introduction to e-Health
   - Electronic Medical Records (EMR)
   - Clinical Documentation Architecture (CDA)
   - Standardization
6. m-Health
   - Introduction to m-Health
   - Body Area Networks
   - Social Networks on Healthcare
   - Cloud Computing on e-Health
   - Security and Privacy in e-Health

Recommended reading

1. Damas, L. , "SQL - Structured Query Language - 14ª Edição Atualizada", FCA, 2017
2. Gouveia, F. , "Fundamentos de Bases de Dados", Editora FCA - 2014
3. Pianykh, O. , "Digital Imaging and Communications in Medicine (Dicom), A Practical Introduction and Survival Guide", Springer, 2012
4. Eduonix, S. , "Machine Learning for Healthcare Analytics", Packt, 2018
5. Rodrigues, J. , "E-Health Systems: Theory and Technical Applications", ISTE Press - Elsevier, 2016

Teaching and learning methods

Exposition of the syllabus using different methodologies (expository and text study). Analysis and group discussion of problems and solutions. Resolution of exercises, using computer equipment in the classroom.

Assessment methods

- Assessment - (Regular, Student Worker) (Final, Supplementary, Special)
  - Final Written Exam - 100%

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

Sandra Carvalho Dias	Ana Maria Geraldes Rodrigues Pereira	Ana Maria Nunes Português Galvão	Adília Maria Pires da Silva Fernandes
14-02-2024	15-02-2024	15-02-2024	16-02-2024