DISCIPLINE SHEET

1. Study programme

1.1.	"CAROL DAVILA" UNIVERSITY OF MEDICINE AND PHARMACY BUCHAREST
1.2.	FACULTY OF DENTISTRY
1.3.	DEPARTMENT 3
1.4.	DISCIPLINE MEDICAL INFORMATICS AND BIOSTATISTICS
1.5.	STUDY DOMAIN: Health, sectoral regulated within the European Union
1.6.	STUDY LEVEL: I (Bachelor's degree) and II (Master's degree)
1.7.	STUDY PROGRAMME: DENTAL MEDICINE IN ENGLISH

2. Discipline

2.1.	Discipline name according to the study curriculum: DATABASES AND ARTIFICIAL INTELLIGENCE ELEMENTS IN DENTISTRY				
2.2.	Discipline code: MD04OP20EN				
2.3.	Discipline type (FD/SD/CD): -				
2.4.	Discipline optionality (COD/ED/FAD): ED				
2.5.	Lectures tenure: Ionuț-Adrian Chiriac, PhD - Lecturer				
2.6.	Practical classes / seminar tenure: 1. Lect. Dr. Eng. Ionuț – Adrian CHIRIAC 2. Lect. Dr. Eng. Radu ILINCA				
2.7. Year of study	I	2.8. Semester	II	2.9. Evaluation (E/C/V)	C

3. Estimated total time (hours/ semester of teaching and training activity /individual study)

I. University training						
3.1. Number of hours per week	2	from which:	3.2. lecture	1	3.3. practical class/ seminar	1
3.4. Total hours in the study curriculum	28	from which:	3.5. lecture	14	3.6. practical class/ seminar	14
II. Preparation/ individual study						
Time distribution						hours
Study of lecture materials, textbooks, books, study of the minimum recommended bibliography						22
Additional documentation activity in the library, on online platforms						2
Specific preparation activities for projects, practical classes, preparation of assignments, reports						5
Preparation for presentations or evaluations, preparation for the final examination						2
Tutoring activity						1
Other activities						-
3.7. Total hours of individual study						32
3.8. Total hours per semester (3.4.+3.7.)						60
3.9. Number of credits						2

4. Prerequisites (where appropriate)

4.1. curriculum	The student must have completed algebra and IT&C courses – "Information Technology and Computers" - high school level (regardless of the route). The student must have basic knowledge of algebra elements, computer editing at a high school level, and general knowledge of computer work.
4.2. proficiencies	The student must be able to: - to explore the internet - identify documentation and help menus in apps - be able to execute a sequence of steps described in an audio-video and/or written tutorial - general operation on a computer and digital text editing.

5. Conditions (where appropriate)

5.1. for lecture activity	The teaching activity takes place in the amphitheater. The activity does not imply special environmental conditions. The room must provide a capacity of 90 students. In terms of infrastructure, the room must be equipped with a computer (including the necessary software applications), a projection screen, and a video projector. The projection screen must be large enough to allow the slides to be projected in a way that makes them visible from any point in the room. The internet connection and an audio system are optional. Suppose the course activity cannot be carried out in the regular regime (as described above) due to natural disasters, pandemics, or other unforeseen circumstances. In that case, it will be conducted online, with synchronous activities on one of the two platforms: UMFCD G-Suite or Moodle.
5.2. for practical class/ seminar activity	The didactic activity takes place in the seminar/laboratory room. The activity does not imply special environmental conditions. Complete PC workstations are required in proportion to the number of students in the group. All computer equipment must be connected to the Internet and have installed the computer applications necessary for an optimal performance of the teaching activities. Suppose laboratory activities cannot be carried out in the normal regime (as described above) due to natural disasters, pandemics, or other unforeseen circumstances. In that case, they will be conducted online, with synchronous activities on one of the two UMFCD G-Suite or Moodle platforms.

6. Learning outcomes

Knowledge	Skills	Responsibility and autonomy
1. In-depth understanding of the classification, organization, structuring, recording, and accessing of information in the dental environment. 2. Knowledge of the main types of Management and Activity Management IT Applications for Dental Offices and Clinics 4. Recognition and comparison of Dental Management Programs 5. Familiarization with Big Data Databases 2. Knowledge of modern concepts and the correlation between Big Data, Expert Systems, and Artificial Intelligence	1. Development of skills regarding the organization, structuring, ordering, selection, search, retrieval, extraction and transfer of information in working with Computer Registers and Medical Databases. 2. Ability to communicate in Interdisciplinary Technical Language: Informatics, Managerial, and Medical 3. Use and rapid adaptation of the operation and management of various types of Management and Activity Management IT Applications for Dental Offices and Clinics 4. Applicative integration of knowledge and interaction with Artificial Intelligence in the context of Dentistry	1. Correct management of Biomedical Data categories in the specific field of Dentistry 2. Effective planning and delegation of activity in a Dental Office or Clinic 3. Comparative critical evaluation of Management Programs in the Field of Dentistry 4. Manifestation of scientific curiosity and critical thinking, by formulating pertinent questions and evaluating answers through interaction with Artificial Intelligence 3. Adaptation of multidisciplinary interaction and analysis strategies with Big Data and Artificial Intelligence 4. Support of a professional point of view, using arguments derived from the interaction and advanced analysis of information in Databases 5. Ability to formulate hypotheses and professional conclusions based on knowledge, and the ability to use Database exploitation facilities in Dentistry

7. Discipline objectives (correlated with learning outcomes)

7.1. General objective	As an optional course, it develops the skills acquired in the Discipline of Medical Informatics and Biostatistics, particularly in database management. The course presents theoretical notions, concepts, and practical aspects regarding databases, classification, coding, structuring, organization, registration, processing, transmission, and communication of medical information (administrative and clinical).
7.2. Specific objectives	Training the ability to identify input data and output data from a problem Forming the ability to design the structure of the database by defining the types of data and the relationships between them Forming the ability to operate databases, extract relevant information, and draw conclusions supported by database analysis

8. Contents

8.1. Lecture	Teaching methods	Observations
1. Introductory Lecture	- Presentations with the help of slides - Demonstrations - Heuristic Dialogue - Conversation	
1.1. Course Presentation, Going through the discipline sheet. Browse Applicable UMFCD Regulations		N/A

1.2. Description of the applications and IT tools used 1.3. Practical examples of the relevance of databases to dentists Medical Information Flow and Layers of Information Organization in Dentistry	- Video Tutorials - Direct Interaction with Artificial Intelligence **Classroom/Informatics Laboratory** **Course support:** - Power Point presentation - multimedia educational software - Google Classroom - course support manuals (electronic, multimedia and printed format) - practical demonstration support (Internet usage) - Video Tutorials - Direct Interaction with Artificial Intelligence If the course activity cannot be carried out face-to-face, the online platforms will be used in synchronous regime: **Cloud/Online - Practical work support:** Educational platform Google Suite -Google Classroom, Google Meet, Google Calendar, Google Forms, Google Drive, The Moodle https://cursuridentara.umfcd.ro/ platform.	
2. Types of Database Architectures		
2.1 Tables - Fields/Records 2.2 Forms - Entering and updating data 2.3 Big Data in Dentistry 2.4 Interoperability between different types of data		N/A
3. **Advanced Database Operations**		
3.1 Queries – Conditions – Sorting/Filtering 3.2 Queries calculated fields – edit formulas and data format configuration 3.3 Expert Systems in Dentistry		N/A
4. **Database Facilities**		
4.1 Reports – Information Organization in Reports 4.2 Relationships - Connections in a database 4.3 Management Programs in Dentistry		N/A
5. Management applications offices and clinics		
Management Programs in Dentistry - 5.1 New Patient, Patient Record, Anamnesis 5.2 Patient Data, Daily Appointment, Schedule, Materials Management 5.3 Dental Mirror, Dental Status, Plan Treatment Sheet, Prosthetic Sheet, of Dental Technicians List 5.4 Database of Receipts and Payments, Balance for the Clinic, Centralizer Reports, Statistics Examples on DentaPro, Dentalmap, etc.		N/A
6. Artificial Intelligence used in Dentistry		
6.1 What are Artificial Intelligence systems 6.2 Evolution from Expert Systems to Artificial Intelligence in Dentistry 6.3 Artificial Intelligence Systems Applications in Dentistry		N/A
7. **Recapitulation/Practical Simulation Colloquium**		
7.1 Recapitulation Practical Simulation Colloquium / Assessment		N/A

Recent bibliography:

1. ECDL Database Manual - Microsoft Access 2019 - Raluca Constantinescu, Ionuț Dănăilă, ISBN / ISSN, 978-606-9037-10-2, ECDL Romania Publishing House 2020
2. Ionuț-Adrian Chiriac, "Database Applications - Microsoft Access - Guide for Practical Works", 2021 – published online on Google Classroom – in the process of publishing printed physical format
3. ECDL Spreadsheet Manual - Microsoft Excel 2019 - Raluca Constantinescu, Ionuț Dănăilă, ISBN / ISSN 978-606-9037-09-6, ECDL Romania Publishing House 2020
4. Excel Rentrop & Practical Guide Straton - Marius Roman ISBN/ISSN, 9786066727570, Editura Rentrop & Straton 2021

<table>
<tr><th>8.2. Practical classes/ seminar</th><th>Teaching methods</th><th>Observations</th></tr>
<tr><td>1. Introductory LP
• Presentation of the online use of educational software Google Classroom, Meet, Calendar, Forms, Drive the Moodle platform https://cursuridentara.umfcd.ro/.
• Laboratory - Initiation on how to work and use the local computing network and internet access.
Work Protection Training</td><td rowspan="7">Presentation
Information analysis
Heuristic conversation,
Demonstration
Discovery and guided research
Problematization, exemplification, debate
- Video Tutorials
- Direct Interaction with Artificial Intelligence

Informatics Laboratory
- MS Windows operating system software,
- MS Office software package
- Software
- Power Point presentation
- Multimedia educational software
- Google Classroom
- manual in electronic and printed format
- dental imaging demo software applications
- computer applications in dental medicine
Technical equipment/ Informatics laboratory:
Local computing and Internet network
- network-interconnected workstations
- computer-assisted training and evaluation software (Veyon and Moodle system)
- multimedia equipment
- Projector
- projection screen
- blackboard
Support of practical works:
Online
Educational platform
Google Suite - Google Classroom, Google Meet, Google Calendar, Google Forms, Google Drive,
The Moodle https://cursuridentara.umfcd.ro/platform.</td><td>N/A</td></tr>
<tr><td>2. Microsoft Access program.
• Design of relational databases. Practical Application (I)
Tables/Fields and Records. Data Types and Properties</td><td>N/A</td></tr>
<tr><td>3. Microsoft Access program.
Design of relational databases Practical Application (II) Forms/Stages of Configuration and Editing Format. Entering and Updating data</td><td>N/A</td></tr>
<tr><td>4. Microsoft Access Program
Design of relational databases Practical application (III). Sorting and Filtering. Simple and Complex Queries.</td><td>N/A</td></tr>
<tr><td>5. Microsoft Access Program
• Design of relational databases Practical application (IV)
Queries with Calculation Formulas. Functions and Statistical Formulas in Access</td><td>N/A</td></tr>
<tr><td>6. Microsoft Access Program
• Design of relational databases
Practical application (V) Relationships and Reports. Data Import and Export in Access.</td><td>N/A</td></tr>
<tr><td>7. Recapitulation
Practical Simulation Colloquium / Assessment</td><td>N/A</td></tr>
<tr><td colspan="3">Recent bibliography:
1. ECDL Database Manual - Microsoft Access 2019 - Raluca Constantinescu, Ionuț Dănăilă, ISBN / ISSN, 978-606-9037-10-2, ECDL Romania Publishing House 2020
2. Ionuț-Adrian Chiriac, "Database Applications - Microsoft Access - Guide for Practical Works", 2021 – published online on Google Classroom – in the process of publishing printed physical format
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9. Assessment

Activity type	9.1. Evaluation criteria	9.2. Evaluation methods	9.3. Percentage of final grade
9.4. Lecture	The final check focuses on evaluating the knowledge and skills acquired during the semester, based on a grid test that assesses conceptual understanding of the presented notions and the correct identification of the appropriate statistical tests for each type of problem studied. The ability to analyze, synthesize, and pay attention to details.	Colloquium Examination Test Grid	60%
9.5. Practical classes/ seminar	Continuous assessment of students is carried out through the periodic evaluation of the portfolio, which is composed of projects completed during the semester, using scales established at the discipline level for each project and topic. The grade obtained in the practical activity is the result of the arithmetic average of the grades received throughout the semester. Promotility involves the complete delivery of the projects according to the format and requirements presented and requested in advance on Google Classroom, and obtaining the promotion average.	Colloquium / periodic check throughout the semester. Evaluation of written documentation and oral defense	40%
9.5.1. Individual project (if any)	N/A	N/A	N/A
Minimum performance standard			
Correctly defining the architecture of a database for a practical application. Knowledge and differentiation between the main types of objects and operations that can be performed in databases - data entry, queries, sorting, filtering. Coding the main types of data - numerals, ordinals, date, text, etc. Definition and applications of Big Data, Expert Systems and Artificial Intelligence in Dentistry.			