DISCIPLINE SHEET

1. Study programme

1.1.	**"CAROL DAVILA" UNIVERSITY OF MEDICINE AND PHARMACY BUCHAREST**
1.2.	**FACULTY OF DENTISTRY**
1.3.	**DEPARTMENT: 2nd DEPARTMENT**
1.4.	**DISCIPLINE: Scientific research methodology-ergonomics**
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:** **SCIENTIFIC RESEARCH METHODOLOGY**				
2.2.	**Discipline code:** MD02C04EN				
2.3.	**Discipline type (FD/SD/CD): CD**				
2.4.	**Discipline optionality (COD/ED/FAD): COD**				
2.5.	**Lectures tenure:** Cristina Teodora Preoteasa, Assoc Prof; Cristina Pirvu, Lecturer				
2.6.	**Practical classes / seminar tenure:** Anca Axante, Teaching assistant; Cristina Pirvu, Lecturer; Cristina Teodora Preoteasa, Assoc Prof				
2.7. Year of study	**II**	**2.8. Semester**	**III**	**2.9. Evaluation (E/C/V)**	**E**

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

I. University training						
3.1. Number of hours per week	**4**	**from which:**	**3.2. lecture**	**2**	**3.3. practical class/ seminar**	**2**
3.4. Total hours in the study curriculum	**56**	**from which:**	**3.5. lecture**	**28**	**3.6. practical class/ seminar**	**28**
II. Preparation/ individual study						
Time distribution						**hours**
Study of lecture materials, textbooks, books, study of the minimum recommended bibliography						25
Additional documentation activity in the library, on online platforms						15
Specific preparation activities for projects, practical classes, preparation of assignments, reports						19
Preparation for presentations or evaluations, preparation for the final examination						20
Tutoring activity						10
Other activities						5
3.7. Total hours of individual study						94
3.8. Total hours per semester (3.4.+3.7.)						150
3.9. Number of credits						5

4. Prerequisites (where appropriate)

4.1. curriculum	Medical informatics and biostatistics
4.2. proficiencies	Basic computer operating skills

5. Conditions (where appropriate)

5.1. for lecture activity	Minimum 50 seats conference hall, laptop, video projector, internet and scientific database access
5.2. for practical class/ seminar activity	Seminar classroom with desks and chairs, white board, laptop, video projector, internet connection, scientific database access, statistics software access. Dental offices equipped with necessary materials and instruments for various research applications.

6. Learning outcomes*

Knowledge	Skills	Responsibility and autonomy
C1. The student/graduate knows the terminology used and the particular aspects of the methodology of scientific research in the medical and dental fields C2. The student/graduate knows the principles of designing and carrying out research activities in the medical and dental fields C3. The student/graduate knows and respects the ethical values of carrying out and publishing scientific research C4. The student identifies, describes and analyses means of generating, critically evaluating and disseminating methods of scientific research.	A1. The student/graduate formulates a feasible question to be tested through scientific research A2. The student/graduate formulates the protocol for scientific research A3. The student uses reported research results found in medical scientific literature in order to have an informed medical opinion and to update scientific knowledge. A4. The student critically evaluates the reported research results found in scientific medical papers.	RA1. The student proves critical skills and scientific interest through generating intelligent questions, professionally related, and through active search of relevant information in scientific medical literature. RA2. The student proves ability to work in teams aiming at generating and critically evaluating scientific research.

7. Discipline objectives (correlated with learning outcomes)

7.1. General objective	- to know how scientific research is conducted and presented in the medical field
7.2. Specific objectives	- to know how to do a proper literature research using scientific databases - to know how to formulate research aim, objectives and hypothesis

	- to know the main types of clinical study designs, their advantages and disadvantages. -to know the general elements that contribute to the validity while using different sampling methods - to understand the variable selection method and data registering - to understand statistical analysis - to know the format used in scientific articles for communicating research results - to know how to critically appraise clinical researches

8. Contents

8.1. Lecture	**Teaching methods**	**Observations**
1. Scientific research- definition and general characteristics	Lecture, interactive presentation, power point video presentation	
2. Different research types used in the medical field.		
3. The research protocol		
4. Literature research and its importance in research. Referencing styles (author-date systems; Vancouver system).		
5. Study aim, objective and/or hypothesis. Clinical study classification		
6. Case study. Case series. Surveys and cross-sectional studies.		
7. Case-control studies.		
8. Cohort studies.		
9. Randomized controlled trials.		
10. Participants – sources, sampling		
11. Study variables and data collection methods.		
12. Statistical analysis. Factors important in choosing statistical analysis method. Main statistical analysis directions. Statistical analysis results presentation (text, tables and figures/graphs).		
13. IMRAD format for presenting researches.		
14. Evidence based medicine.		

Recent bibliography:

1. Lectures, version for 2025-2026 academic year - available on discipline's domain of Google Classroom
2. Preoteasa CT, Buzea MC, Imre M, Ranga RC, Preoteasa E. Reporting ethics approval and informed consent of in vivo researches in dental journals. Rom J Leg Med; 2018:26(3): 323-328.
3. Bruno V, Aquino C, Pringsheim T. Selecting Research Methods to Address Clinical Questions. Mov Disord Clin Pract. 2024 Dec;11 Suppl 3(Suppl 3):S21-S25. doi: 10.1002/mdc3.14088. Epub 2024 May 24. PMID: 38787768; PMCID: PMC11616194.
4. Kiani AK, Naureen Z, Pheby D, Henehan G, Brown R, Sieving P, Sykora P, Marks R, Falsini B, Capodicasa N, Miertus S, Lorusso L, Dondossola D, Tartaglia GM, Ergoren MC, Dundar M, Michelini S, Malacarne D, Bonetti G, Donato K, Medori MC, Beccari T, Samaja M, Connelly ST, Martin D, Morresi A, Bacu A, Herbst KL, Kapustin M, Stuppia L, Lumer L,

Farronato G, Bertelli M; INTERNATIONAL BIOETHICS STUDY GROUP. Methodology for clinical research. J Prev Med Hyg. 2022 Oct 17;63(2 Suppl 3):E267-E278. doi: 10.15167/2421-4248/jpmh2022.63.2S3.2769. PMID: 36479476; PMCID: PMC9710407.
5. Kay E. Why evidence based dentistry? Evid Based Dent. 2023;24(1):1. doi: 10.1038/s41432-023-00872-w.
6. Peacock PJ. Oxford Handbook of Medical Statistics. Oxford: Oxford University Press. 2013.
7. Goldstein GR. Evidence-Based Dentistry: Causation. J Prosthodont. 2021;30(9):737-741. doi: 10.1111/jopr.13431.

8.2. Practical classes/ seminar	**Teaching methods**	**Observations**
1. Literature research in medical sciences. Usage of electronic scientific databases.	Practical and theoretical applications using conventional and digital frameworks, working individually or in micro groups, exercises, case studies, debates	
2. Exercises of literature research on specific medical themes in the context of conducting research, with referencing exercises in author-date and Vancouver systems. Citation exercises for books and articles.		
3. Formulating research problem (aim, hypothesis). PICO/PECO format. Theme framing of the research problem (e.g., etiology, therapy). Study types (descriptive vs analytical, observational vs experimental, transversal vs longitudinal).		
4. Most frequently used study designs in medical research, with example of their use (e.g., etiology or therapy hypothesis)		
5. In depth understanding of the case report, exemplified using scientific articles.		
6. In depth understanding of the cross-sectional and case-control study, exemplified using scientific articles.		
7. In depth understanding of the cohort study, exemplified using scientific articles		
8. In depth understanding of the randomized controlled trial, exemplified using scientific articles.		
9. Random sampling- exercises of use of random number table, systematic sampling, stratified sampling, cluster sampling. Case study.		
10. Exercises of variable classification and registration on different scales of measurent. The questionnaire as a data collection tool- building up exercises		
11. Statistical analysis exercises – aims and methods of analysis in regard to variable type and study aim.		
12. Exercises of research results presentation – understanding and constructing graphs (e.g., histograms, bar graphs, scatterplot).		
13. Exercises of presentation of research results using the IMRAD format. Case study using STROBE/CONSORT reporting guidelines		

14. Critical scientific article analysis exercise, in the context of evidence-based decision-making		

Recent bibliography:

1. Preoteasa CT, Buzea MC, Imre M, Ranga RC, Preoteasa E. Reporting ethics approval and informed consent of in vivo researches in dental journals. Rom J Leg Med; 2018:26(3): 323-328.
2. Bruno V, Aquino C, Pringsheim T. Selecting Research Methods to Address Clinical Questions. Mov Disord Clin Pract. 2024 Dec;11 Suppl 3(Suppl 3):S21-S25. doi: 10.1002/mdc3.14088. Epub 2024 May 24. PMID: 38787768; PMCID: PMC11616194.
3. Kiani AK, Naureen Z, Pheby D, Henehan G, Brown R, Sieving P, Sykora P, Marks R, Falsini B, Capodicasa N, Miertus S, Lorusso L, Dondossola D, Tartaglia GM, Ergoren MC, Dundar M, Michelini S, Malacarne D, Bonetti G, Donato K, Medori MC, Beccari T, Samaja M, Connelly ST, Martin D, Morresi A, Bacu A, Herbst KL, Kapustin M, Stuppia L, Lumer L, Farronato G, Bertelli M; INTERNATIONAL BIOETHICS STUDY GROUP. Methodology for clinical research. J Prev Med Hyg. 2022 Oct 17;63(2 Suppl 3):E267-E278. doi: 10.15167/2421-4248/jpmh2022.63.2S3.2769. PMID: 36479476; PMCID: PMC9710407.
4. Kay E. Why evidence based dentistry? Evid Based Dent. 2023;24(1):1. doi: 10.1038/s41432-023-00872-w.
5. Peacock PJ. Oxford Handbook of Medical Statistics. Oxford: Oxford University Press. 2013.

Goldstein GR. Evidence-Based Dentistry: Causation. J Prosthodont. 2021;30(9):737-741. doi: 10.1111/jopr.13431.

9. Assessment

Activity type	**9.1. Evaluation criteria**	**9.2. Evaluation methods**	**9.3. Percentage of final grade**
9.4. Lecture	Knowledge correctness, the ability to correlate and summarize information.	Written evaluation (multiple-choice exam)	70%
9.5. Practical classes/ seminar	The ability to apply theory in practical skills	Evaluation (written evaluation)	10%
9.5.1. Individual project (if any)	Presentation and critical assessment of an original research article published in a scientific journal.	Project (written documents evaluation and oral presentation)	20%
Minimum performance standard			
Grade for each evaluation- 5 minimum Knowing elementary elements regarding scientific research in the medical field. The student must know how to state a feasible research question using the PICO/PECO framework and to correctly identify and describe different types of study designs for testing it.			