SVEUČILIŠTE U RIJECI - MEDICINSKI FAKULTET
UNIVERSITY OF RIJEKA - FACULTY OF MEDICINE

INTRODUCTION TO SCIENTIFIC RESEARCH
(5 pages)

Faculty of Medicine of the University of Rijeka
Course: Introduction to Scientific Research
Course coordinator: Vanja Pupovac, PhD, Assistant professor
Department: Department of Social Sciences and Medical Humanities
Study program: Integrated Undergraduate and Graduate University Study of Medicine in English
Year: 2nd
Academic year: 2019/2020

SYLLABUS

Course information (brief course description, general guidelines, location and organisation of instruction, required equipment, instructions regarding class attendance and preparation, students' obligations, etc.):

The course "Introduction to scientific research" is obligatory for the 2nd year of the Integrated Undergraduate and Graduate University Study of Medicine in English programme, encompassing 15 hours of lectures and 5 hours of seminars and enabling the acquisition of one (1) ECTS credit.

The course is expected to help students to gain insight into the laws of the scientific research process and to get acquainted with basics of science philosophy and theory, as well as to gain the skills of critical evaluation of scientific paper.

Assigned reading:

1. Presentations (PPT);
2. Hulley SB Cummings SR, Browner W S Grady DG, Newman TB, ed ., Designing Clinical Research . 4th ed ., Philadelphia, USA: Lippincott Williams & Wilkins, A Wolters Kluwer Business ; 2013.
3. Matko Marušić, ed., *Principles of Research in Medicine*, 2nd ed., Zagreb: Medicinska naklada, 2015.

Optional / additional reading:

Evans I, Thornton H, Chalmers I and Glasziou P. Testing Treatments, 2nd Edition; London: Pinter and Martin. 2011. Available from: http://www.testingtreatments.org/

Course teaching plan:

List of lectures (with titles and description)

1. **Definitions (Schopenhauer, Shaw, Eccles, Marušić), the importance and the laws of the historical development of science (developmental phases, "migrating" of the scientific avantguard, specificities of medicine)**
   Outcomes: to understand the importance and laws of the historical development of science, to

describe and interpret the phases of scientific development and the specificities of medicine. to explain the most important stands in science philosophy and to illustrate them by examples from science history.

2. **Bases of science philosophy (the structure of scientific revolutions according Kuhn; Wittgenstein, Popper, Feyerabend)**
   Outcomes: to name and explain basic notions of science philosophy, to analyse the historical development of empirical-inductive and deductive traits of science philosophy.
3. **Science in medicine: medical examination, scientific thinking, differences between medicine and alternative medicine**
   Learning outcomes: Understand the basic science settings of medicine
4. **Scientific medical publications: types, basic characteristics, structure of scientific paper**
   Outcomes: to differentiate medical information (primary, secondary, and tertiary publications
5. **Scientific medical publications: bibliographic and citation databases; assessment of scientific paper/journal**
   Outcomes: to search bibliographic and citation databases
6. **Types of study design (observational, interventional)**
   Outcomes: to describe and understand aims of research and appropriate types of study design.
7. **Types of study design (primary and secondary, hierarchy of evidence)**
   Outcomes: to recognise aims and study design in an example of a research, to understand hierarchy of evidence
8. **Population and sample (definition, basic characteristics)**
   Outcomes: to understand basic characteristics of the sample, to understand importance of representativeness of a sample and random sampling method
9. **Population and sample (probabilistic and non-probabilistic sampling method; bias and random error)**
   Outcomes: to describe and understand different sampling methods, to recognise the most common biases in sampling method
10. **Planning research (problem, aim, hypothesis)**
    Outcomes: to describe and understand differences between problem, aim and hypothesis in scientific research.
11. **Planning research (phases of research plan)**
    Outcomes: to describe and understand phases of research plan
12. **Sources of imperfection and biases in research**
    Outcomes: to define possible sources of imperfection and biases in research.
13. **Critical reading of a paper and ways of publishing the results (oral communication; poster)**
    Outcomes: to explain the ways of publishing the results of scientific research.
14. **Bases of research integrity (research misconduct; frauds in science)**
15. Outcomes: to understand the concept of research ethics and the importance of ethical principles in science. To recognize the forms of plagiarism and to discuss the ways of its prevention.
16. **Quoting literature**
    Outcomes: to master the ways of literature citing and the evaluation of websites.

List of seminars with descriptions:

Seminars (1-5) imply designing a research plan according to a predetermined topic. The plan is made in groups of 3-5 students according to detailed instructions and it is additionally coordinated by the seminar leader.

List of practical with descriptions:

The course does not include practical.

Students' obligations:

Regular class attendance, four quizzes (max 40%), two practical assignments (max 10%), the development of a research plan (max 20 %), and the final written exam (max 30 %).

Exam (exam taking, description of written/oral/practical part, point distribution, grading criteria)

- the final exam is of written form; the exam lasts for 30 minutes and entails a multiple-choice and short answers types of questions in accordance with the reference list available on the website;
- in accordance with the general rules of the Faculty of Medicine, a minimum of 50 % of correct answers is required to pass the exam;
- in order to be admitted to the final exam, the student has to gather at least 35 (50 %) of the total of 70 points before the final exam.

Possibility of teaching in another language:

The course is offered in Croatian and English.

Other important information regarding the course:

Missing up to 30 % of the classes (with a presumed justified reason), does not require justification and cannot be made up for (the exception being provided by a hospital discharge letter). Missing more than 30 % of classes, no matter the reason, will prevent the student from taking the final exam and result in a repeated enrolment in the course the following academic year.

It is not possible to "**decline**" a positive mark, but students can appeal to the Dean in written form within 24 hours.

Collaborator: Amir Muzur MD, MA, PhD, Full Professor

COURSE SCHEDULE (for academic year 2020/2021)

Date	Lectures (time and place)	Seminars (time and place)	Practicals (time and place)	Instructor
19/04/2021	10:00-12:00 (P15)			Vanja Pupovac, PhD, Assistant professor
26/04/2021	11:00-13:00 (P15)			Vanja Pupovac, PhD, Assistant professor
03/05/2021	11:00-13:00 (P15)			Vanja Pupovac, PhD, Assistant professor
10/05/2021	11:00-13:00 (P1)			Amir Muzur, MD, MA, PhD, Full Professor
17/05/2021	11:00-13:00 (P15)			Vanja Pupovac, PhD, Assistant professor
24/05/2021	11:00-13:00 (P15)			Amir Muzur, MD, MA, PhD, Full Professor
31/05/2021	11:00-13:00 (P1)			Amir Muzur, MD, MA, PhD, Full Professor
20/05/2020		11:00-15:00 (group 1) S1, S2		Vanja Pupovac, PhD, Assistant professor
28/05/2020		11:00-15:00 (group 2) S1, S2		Vanja Pupovac, PhD, Assistant professor
4/06/2020		11:00-12:00 (group 1) S3, S4, S5		Vanja Pupovac, PhD, Assistant professor
08/06/2020	11:00-13:00 (P15)			Vanja Pupovac, PhD, Assistant professor
12/06/2020		11:00-12:00 (group 2) S3, S4, S5		Vanja Pupovac, PhD, Assistant professor

List of lectures, seminars and practicals:

	LECTURES (topic of lecture)	Teaching hours	Place
P1	Definitions (Schopenhauer, Shaw, Eccles, Marušić), the importance and the laws of the historical development of science (developmental phases, "migrating" of the scientific avant-garde, specificities of medicine)	1	
P2	Laws of the historical development of science (Mesopotamia, Egypt, India, China, Pre-Columbian America, ancient Greece and Rome, Middle Ages)	1	
P3	Science in medicine: medical examination, scientific thinking, differences between medicine and alternative medicine	1	
P4	Scientific medical publications: types, basic characteristics, structure of scientific paper	1	
P5	Scientific medical publications: bibliographic and citation databases; assessment of scientific paper/journal	1	
P6	Types of study design (observational, interventional	1	
P7	Types of study design (primary and secondary, hierarchy of evidence)	1	
P8	Population and sample (definition, basic characteristics)	1	
P9	Population and sample (probabilistic and non-probabilistic sampling method; bias and random error)	1	
P10	Planning research (problem, aim, hypothesis)	1	
P11	Planning research (phases of research plan)	1	
P12	Sources of imperfection and biases in research	1	
P13	Critical reading of a paper and the ways of publishing the results (oral communication; poster)	1	
P14	Quoting literature	1	
P15	Bases of research integrity		
	Total number of lecture hours	**15**	

	SEMINARS (topic of seminar)	Teaching hours	Place
S1-5	Designing a research plan	5	
	Total number of seminar hours	**5**	

	PRACTICALS (topic of practical)	Teaching hours	Place
V1	/	/	
	Total number of practicals hours		

	EXAM DATES (final exam)
1.	24/06/2021
2.	09/07/2021
3.	16/09/2021