COURSE DESCRIPTION CARD - SYLLABUS

Course name
Molecular diagnostics as the basis of personalized medicine [S1IFar1>DMJPMS]

Course

Field of study
Pharmaceutical Engineering

Year/Semester
2/3

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
0

Laboratory classes
0

Other (e.g. online)
0

Tutorials
15

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

Students entering the course should have well-grounded theoretical knowledge in the field of molecular biology, biochemistry and physiology of human cells, as well as the basic course of Molecular Biology.

Course objective

As part of the course, students will learn about innovative molecular biology methods, as well as leading trends in the search for new drugs, their metabolism and gripping points by personalizing pharmaceutical care. As part of the course, students acquire knowledge and skills to understand the pathomechanism of genetically determined human diseases, as well as mechanisms of pharmacokinetics and pharmacogenetics, which should be considered in the process of planning and implementing pharmaceutical engineering tools. The students" task is to master the ability of an interdisciplinary look at integrated human metabolism in the field of molecular biology and to create the basis for the usefulness of pharmaceutical engineering in personalizing pharmacotherapy.

Course-related learning outcomes

Knowledge:
student has knowledge of the physicochemical and biological foundations of health sciences within the

scope appropriate for pharmaceutical engineering, including basic issues within the scope of subjects such as biology, pharmaceutical botany, biotechnology, biochemistry, molecular biology, human anatomy and physiology. k_w5, p6s_wg

Skills:
student uses computer programs supporting the implementation of tasks typical for pharmaceutical engineering; uses information technology to describe phenomena and data analysis. k_u19, p6s_uw, p6si_uw
can plan and carry out simple experiments in the field of pharmaceutical engineering, both experimental and simulation, and interpret their results and draw conclusions k_u12, p6s_uw, p6si_uw
can prepare and present, both in polish and in a foreign language, an oral presentation on specific issues of pharmaceutical engineering k_u5, p6s_uk
understands literature in the field of pharmaceutical engineering in polish; reads and understands uncomplicated scientific and technical texts in a foreign language, is able to obtain information from literature, databases and other sources related to pharmaceutical engineering, also in a foreign language, integrate them, interpret them and draw conclusions and formulate opinions k_u1, p6s_uw, p6s_uk

Social competences:
is ready to cultivate and disseminate patterns of good conduct both within and outside the work environment, in line with the achievements and traditions of the profession. k_k8, p6s_kr
is able to properly set priorities for the implementation of the task specified by himself or others, has a habit of supporting assistance and remedial actions, is responsible for the safety of own and other work, knows how to act in an emergency k_k¬5, p6s_ko, p6s_kr
is ready to make independent decisions and lead a team, critically assess his own actions and those of the team, take responsibility for the effects of these activities and is able to cooperate and work in a group, inspire and integrate the professional environment. k_k2, p6s_kk
is ready to critically assess his knowledge, understands the need for further education, supplementing specialized knowledge and improving his professional, personal and social competences, understands the importance of knowledge in solving problems and is ready to seek expert opinions. k_k1, p6s_kk

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Observation of student work during seminars and analysis of his/her ability to work independently and teamwork, assessment of understanding of classes. Final test.

Programme content

Students will learn the theoretical and practical foundations regarding the impact of the occurrence of polymorphisms on drug metabolism and response to pharmacotherapy, as well as genetic profiling in the context of individualized therapy.
As part of the classes, depending on the chosen activity path, students have the opportunity to conduct:
(i) analysis of tools for genetic identification conditioning susceptibility to genetic and environmental conditions,
(ii) analysis of tools enabling the identification of factors conditioning patient resistance to pharmacotherapy,
(iii) analysis of innovative methods of gene therapy and therapies using modern trends in pharmacotherapy based on the design of drugs from the group of ribozymes and oligonucleotides
(iv) analysis of the setting of trends in genetic engineering conditioned by the demand for modulators of pharmacogenomics, pharmacokinetics and pharmacodyamics

Teaching methods

seminars

Bibliography

Basic
J. Sambrook, E.F. Fritsch, T. Maniatis. Molecular Cloning: A Laboratory Manual. Molecular Cloning: A

Laboratory Manual. , Cold spring harbor laboratory press, 1989.
Additional
Lucjan Jacak, Pawel Hawrylak, Arkadiusz Wojs. Quantum Dots (NanoScience and Technology)
Opracowanie zbiorowe. Klonowanie i komórki macierzyste , Wydawnictwo Agora, 2011.

Breakdown of average student's workload

	Hours	ECTS
Total workload	30	1,00
Classes requiring direct contact with the teacher	20	0,70
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,30