



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Master's thesis preparation [S2Bioinf2>PMGR]

Course

Field of study
Bioinformatics

Year/Semester
2/3

Area of study (specialization)
–

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
60

Number of credit points

14,00

Coordinators

dr hab. inż. Marek Wojciechowski prof. PP
marek.wojciechowski@put.poznan.pl

Lecturers

Prerequisites

Students starting this course should have basic knowledge related to the selected topic of the Master's thesis in bioinformatics. They should have essential competencies acquired during the earlier years of studies, which allow them to realize the Master's thesis. When it comes to social competencies, the students must present honesty, responsibility, perseverance, cognitive curiosity, creativity, personal culture, and respect for other people.

Course objective

The main goal for students is to carry out specific scientific research or a complex project in bioinformatics and prepare a Master's thesis.

Course-related learning outcomes

Knowledge:

Knows and understands the methods, techniques and tools used in the process of solving complex bioinformatics tasks, mainly of an engineering nature.

Knows and understands the life cycle of information systems.

Knows and understands the principles of bioinformatics research planning, including those based on

systems approaches.

Knows and understands the development trends in bioinformatics.

Knows and understands the social, economic and legal conditions of his/her activities and the need to take them into account in practice, including issues of intellectual and industrial property protection, as well as threats to society and ethical dilemmas.

Skills:

Can fluently use and integrate information obtained from literature and electronic sources, in Polish and English, evaluate, critically analyze, synthesize and creatively interpret them.

Is able to draw conclusions, clearly formulate and fully justify his/her opinions on the basis of data from various sources.

Is able to use advanced techniques and computer tools to solve biological problems and assess their usefulness.

Is able to, under the guidance of a tutor, plan and carry out research tasks, including those of an engineering nature, using analytical, simulation and experimental methods.

Is able to design and create complex computer software according to given specification, taking into account non-technical aspects, using adequate methods, techniques and tools.

Is able to prepare a presentation of research results in Polish and English and discuss them, as well as lead a debate on these issues, in scientific and other communities.

Is able to prepare a written study in Polish and a short scientific report in English, presenting the results of his/her research.

Is able to apply a systems approach to solve bioinformatics tasks, taking into account non-technical aspects, including ethical ones.

Is able to formulate and test hypotheses connected with bioinformatics research problems.

Is able to evaluate the usefulness and applicability of new developments in bioinformatics and biochemistry.

Is able to propose improvements to solutions used in bioinformatics.

Is able to learn independently and plan his/her own career, as well as guide others in this area.

Social competences:

Is ready to be a lifelong learner, inspire and organize the learning of others, including seeking expert opinions, critically evaluating the collected content.

Is ready to perform professional roles responsibly, taking into account maintaining the ethos of the profession, and to comply with the principles of professional ethics and work to ensure compliance with these principles.

Is ready to set priorities to achieve a task defined by him/her or by others and to take action to implement tasks in an enterprising manner.

Is ready to demonstrate a creative attitude in professional and social life and to fulfill the social role of a university graduate, including caring for the public interest.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

- Continuous assessment, through the students' report on the progress of work related to the implementation of the Master's thesis;
- assessment of the increase in the ability to use the learned principles and methods;
- evaluation of reports prepared on selected issues carried out under the project; this assessment may also include the ability to work in a team if the work is carried out as a team;
- assessment of the project results: does the product meet the requirements?, does the product have a friendly interface?, what is the quality of documentation and timely execution of individual tasks?

Programme content

The subject of the Master's thesis is most often the implementation of a research or a project with a research aspect defined by the thesis supervisor. The project is carried out under the supervision of a supervisor who can be additionally aided by another supportive supervisor. This task may include designing and implementing a system in the field of bioinformatics based on the indicated technologies or solution (including implementation and tests) of a research problem.

A well-run project should be based on a recognized project implementation methodology, and the progress of implementation should be shown with appropriate indicators, models, and effects. The

project's final outcome is a report (publication) on the implementation of scientific research, a working prototype, or fully functional software, ready for implementation. An additional project's outcome may be its technical and operational documentation.

Course topics

Depending on the chosen topic of the Master's thesis.

Teaching methods

Consultations on the implemented projects, workshops, discussions on the presented projects.

Bibliography

Basic:

Selected individually, depending on the chosen topic of the Master's thesis.

Additional:

Selected individually, depending on the chosen topic of the Master's thesis.

Breakdown of average student's workload

| | Hours | ECTS |
|---|-------|-------|
| Total workload | 350 | 14,00 |
| Classes requiring direct contact with the teacher | 60 | 2,50 |
| Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation) | 290 | 11,50 |