| A Course unit (module) title | Code |
|---|---|
| **Science Forum I** | |

| Lecturer(s) | Department(s) where the course unit (module) is delivered |
|---|---|
| **Coordinators:** Audronė Jakaitienė, PhD<br>**Tuitors:** tutors from the Faculty of Medicine | Joined forces from different research units |

| Study cycle | Type of the course unit (module) |
|---|---|
| Second cycle | Compulsory |

| Mode of delivery | Period when the course unit (module) is delivered | Language(s) of instruction |
|---|---|---|
| Face-to-face, self-study<br>Lectures, seminars and practice | 2nd semester | English |

| Requirements for students | |
|---|---|
| **Prerequisites:** | **Additional requirements (if any):** |

| Course (module) volume in credits | Total student's workload | Contact hours | Self-study hours |
|---|---|---|---|
| 5 | 135 | 52 | 83 |

| Purpose of the course unit (module): programme competences to be developed | | |
|---|---|---|
| The aim of the course is to develop the ability to critically evaluating the latest research achievements, to discuss the latest scientific issues and problems in systems biology, *to be informed in advances in systems biology science.* | | |
| **Learning outcomes of the course unit (module)** | **Teaching and learning methods** | **Assessment methods** |
| 1.1., 3.1. Be prepared to discuss advanced topics in cell structure and behavioural patterns at the molecular level, the functions of human organs and systems, the mechanisms of physiological regulation and applications of genomics, proteomics, transcriptomics and epigenomics. | Lectures, debates, group discussion, practical assignments, e-conferences with nominated lectures | Completion of practical assignments; Written examination. |
| 2.1. Be able to develop innovating concepts and projects for fundamental or applied research in order to solve arising system biology issues. | | |
| 2.1. Be able to gather and analyse information on subjects related to system biology with a | | |

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|---|---|---|
| critical approach, and to carry out a technological watch. | | |
| 4.1. Perform duties within the deadlines and goals of a project | | |
| 4.1. Perform practical and theoretical work in system biology in accordance with the bioethics requirements. | | |
| 4.2. Have summarising skills enabling them to communicate in a clear manner with specialists from other fields or the public about professional project, on work results, or about the results of tasks. | | |
| 5.1 Be able to work autonomously and as a part of a multidisciplinary team; act honestly and according to ethical obligations | | |
| 5.2. Be able to critically analyse their own research quantitative results and know possible ways for improvement | | |

| **Content: the possible topics** | **Contact hours** | | | | | | | **Self-study work: time and assignments** | |
|---|---|---|---|---|---|---|---|---|---|
| | Lectures | Tutorials | Seminars | Exercises | Laboratory work | Internship/work placement | **Contact hours** | **Self-study hours** | **Assignments** |
| **Research methods in Systems biology**<br>Tutors:<br>A. Jakaitienė<br>A. Rasmusson | <br><br>2<br>2 | | <br><br>6<br>6 | | | | **16** | **30** | Self-study of Tutorials material provided by the lecturer. Reading material in web pages provided by a professor and prepare for the class discussion. |
| **Virusology in Systems biology**<br>Tutors: B. Dadonaitė | 2 | | 4 | | | | **6** | **10** | Self-study of Tutorials material provided by the lecturer. Reading material in web pages provided by a professor and prepare for the class |

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| | | | | | | | | | discussion. |
| **Data visualization and presentation in Systems Biology**<br>Tutors: Allan Rasmusson, PhD | 6 | | 2 | 4 | | | **12** | **22** | Study lecturers' provided material. Preparation for practical exercises. |
| **Medical case studies in Systems biology**<br>1. Omics data intergration at patient level. Tutors: E. Preikšaitienė, E. Siavrienė<br>2. Navigating the complexity: systems biology insights into thyroid.Tutor: L. Zabulienė<br>3. Data applicability: translational research in operating room. Tutor: A. Kielaitė-Gulla | | | 4<br>4<br>4 | | | | **4**<br>**4**<br>**4** | **5**<br>**5**<br>**5** | Study lecturers' provided material. Preparation for practical exercises. |
| **Invited lectures** | 6 | | | | | | **6** | **6** | Study lecturers' provided material. |
| **Total** | **18** | | **30** | **4** | | | **52** | **83** | |

| **Assessment strategy** | **Weight, %** | **Deadline** | **Assessment criteria** |
|---|---|---|---|
| **Research methods in Systems biology** | | | |
| Written proposal for a research project | 35% | In June | Students should submit proposal for a research project based on their master thesis (prepared according to the rules presented and the template provided at the lecture). The following parts of the proposal will be evaluated:<br>• a concise presentation of the scientific proposal, with particular attention to the importance of the research project ( 30%),<br>• the feasibility of the outlined scientific approach (30%)<br>• description of the proposed work in the context of the state of the art of the field (30%)<br>• references to literature should also be included (10%).<br>Maximum length of the proposal is 3 pages without title and reference. |
| **Virusology in Systems biology** | | | |
| Active participation in the class | 10% | During lectures and seminars | Students perform and submit all exercises/tasks in the topic. The performance of practical work is assessed on a scale of 1-10. |
| **Data visualization and presentation** | | | |
| Test | 15% | During lectures and seminars | A test (~4 tasks) where data for a study is handed out and the student must visualize it so that it best conveys the message using techniques learned in course. Report must include discussion of choices made. |
| **Medical case studies in Systems biology** | | | |
| Active participation in the class | 10% each topic | During the topic | Students perform and submit all exercises/tasks in a topic. Active participation in a panel discussion evaluated pass / not passed. |
| **Final grade** | **100** | **At the end of the** | **Final grade of the course is weighted average of all activities and it will be calculated if only all activities** |

| | | | |
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| | | **course** | **very performed (score>0 or pass). If a student does not perform all activities, the cumulative score is not calculated and is marked as absent.**<br>**During the course cycle, there is no retake of homework or test.**<br>**A final grade is considered as passed if the score is 5 or higher.** |

| **Author** | **Year of publication** | **Title** | **Issue of a periodical or volume of a publication** | **Publishing place and house or web link** |
|---|---|---|---|---|
| **Compulsary reading** | | | | |
| Janice R. Matthews and Robert W. Matthews | 2008 | Successful Scientific Writing: A Step-by-Step Guide for the Biological and Medical Sciences | Third Edition | Cambridge University Press |
| Uri Alon | 2019 | An Introduction to Systems Biology: Design Principles of Biological Circuits | 2nd Edition | Chapman & Hall/CRC Mathematical and Computational Biology |
| Umberto Eco | 2015 | How to write a Thesis | | The MIT Press |

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