**COURSE UNIT (MODULE) DESCRIPTION**

| Course unit (module) title | Code |
|---|---|
| **Polymers in pharmaceutical technologies** | |

| Lecturer(s) | Department(s) where the course unit (module) is delivered |
|---|---|
| **Coordinator: dr. Alma Bočkuvienė**<br>**Other(s):** | Faculty of Chemistry and Geosciences, Institute of Chemistry<br>Naugardukas str. 24, LT-03225 Vilnius |

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

| Mode of delivery | Period when the course unit (module) is delivered | Language(s) of instruction |
|---|---|---|
| Face to face | spring | lithuanian |

| Requirements for students | |
|---|---|
| **Prerequisites:**<br>General, analytical, inorganic, organic, polymer chemistry and biochemistry | **Additional requirements (if any):** |

| Course (module) volume in credits | Total student's workload | Contact hours | Self-study hours |
|---|---|---|---|
| 5 | 135 | 64 | 71 |

| Purpose of the course unit (module): programme competences to be developed | | |
|---|---|---|
| To introduce students with polymers, which are used in pharmaceutical technologies and to develop student knowledge aboute polymers using in pharmaceutical technologies processes. | | |
| **Learning outcomes of the course unit (module)** | **Teaching and learning methods** | **Assessment methods** |
| 1. Students will demonstrate knowledge about polymers in pharmaceutical technologies and will know how to apply polymers in pharmaceutical technologies. | Lectures;<br>Individual problem solving;<br>Seminars.<br>Textbook reading. | One self-evaluation tests (open answer questions and short answer tasks);<br>Individual student progress and the last result will be assessed.<br>Assessment of presentations prepared by student<br>Final exam (includes multiple choice questions, open answer questions) |
| 2. Students will able to classify polymers by their properties, structure, conformation and configuration. Also by synthesis type. | | |
| 3. Students will able to apply definitions and to demonstrate their knowledge about polymers, and their application in pharmaceutical technologies. Be able to analyse specific polymers, which are used in pharmaceutical methods. | | |
| 4. Students will able to value critical and reasoned the polymers relevancy in pharmaceutical processes. | | |
| 5. Students will able to plan technological process and the polymers relevancy to produce tablets, capsules, dispersants and drugs delivery technologies. | | |

| Content: breakdown of the topics | Contact hours | | | | | Total contact hours | Self-study hours | Self-study work: time and assignments |
|---|---|---|---|---|---|---|---|---|
| | Lectures | Seminars | Exercises | Laboratory work | Internship/work placement | | | Assignments |
| 1.Introduction. Concepts. History of polymers in pharmaceutical technologies. | 2 | 2 | | | | 4 | **7** | Textbook reading. Problem solving. |
| 2. Polymers and its classification, properties, structure. | 4 | 4 | | | | 8 | **9** | Textbook reading. Problem solving. |
| 3. Polymers synthesis | 4 | 4 | | | | 8 | **9** | Textbook reading. Problem solving. Preparing for the seminar |
| 4. Polymers application in pharmaceutical processes | 2 | 2 | | | | 4 | **5** | Textbook reading. Problem solving. |
| 5.Polymers application in tablets manufacturing | 4 | 4 | | | | 8 | **7** | Textbook reading. Problem solving. Preparing for the seminar |
| 6.Polymers application in coated capsules manufacturing | 2 | 2 | | | | 4 | **5** | Textbook reading. Problem solving. |
| 7. Polymers application in film coated capsules manufacturing | 2 | 2 | | | | 4 | **5** | Textbook reading. Problem solving. |
| 8.Polymres application in diseprsant systems | 4 | 4 | | | | 8 | **8** | Textbook reading. Problem solving. Preparing for the seminar |
| 9.Polymers application in gel tecnology | 2 | 2 | | | | 4 | **4** | Textbook reading. Problem solving. |
| 10.Polymers application in drug delivery systems | 6 | 6 | | | | 12 | **12** | Textbook reading. Problem solving. |

| Assessment strategy | Weight,% | Deadline | Assessment criteria |
|---|---|---|---|
| Self-evaluation test | 40% | 6th semester week | Open answer questions and short answer tasks. Student evaluate his test by presented grading scheme. In case of Fail, student must repeat the test. |
| Seminars | 20% | Every 2 weeks | Preparing presentations by students |
| Final Exam | 40% | June | Multiple choice questions, open answer questions and short answer tasks. |

| Author | Year of publication | Title | Issue of a periodical or volume of a publication | Publishing place and house or web link |
|---|---|---|---|---|
| **Compulsory reading** | | | | |
| Vijay Kumar Thakur, Manju Kumari Thakur | 2015 | Handbook of Polymers for Pharmaceutical Technologies, Volume 1, Structure and Chemistry | ISBN: 978-1-119-04134-4 | New Jersey, Scrinever Publishing LLC, Wiley |
| Vijay Kumar Thakur, Manju Kumari Thakur | 2015 | Handbook of Polymers for Pharmaceutical Technologies, Volume 2, Proccesing and Application | ISBN: 978-1-119-04138-2 | New Jersey, Scrinever Publishing LLC, Wiley |
| Vijay Kumar Thakur, Manju Kumari Thakur | 2015 | Handbook of Polymers for Pharmaceutical Technologies, Volume 3, Biodegradable polymers | ISBN: 978-1-119-04142-9 | New Jersey, Scrinever Publishing LLC, Wiley |
| Vijay Kumar Thakur, Manju Kumari Thakur | 2015 | Handbook of Polymers for Pharmaceutical Technologies, Volume 4, Bioactive and Compatible Synthetic/Hybrid Polymers | ISBN: 978-1-119-04146-7 | New Jersey, Scrinever Publishing LLC, Wiley |
| J.Brandrup, Edmund H. Immergut, E. A. Grulke | 2003 | Polymer Handbook, 2 Volumes Set | ISBN0471479365,9780471479369 | Wiley |