

Study program: PHARMACY
Type and level of studies: Integrated academic studies, Level 1/2
<b>Course unit: PHARMACEUTICAL TECHNOLOGY 2</b>
<b>Teacher in charge: Professor Marina Tomovic, PhD, M.Pharm</b>
Language of instruction: ENGLISH
ECTS: 5
Prerequisites: Completed course in Pharmaceutical technology 1, Signed up for sixth semester
Semester: SUMMER SEMESTER
<p><b>Course unit objective:</b></p> <p>Introducing to pharmaco-technological, physico-chemical and biological factors affecting the release and absorption of drugs, as well as routes of drug administration.</p> <p>Understanding of modern aspects of drug administration, with special emphasis on new materials used in the design of drug administration systems.</p> <p>Synthesis and quality control of parenteral preparations, cytostatics and radiopharmaceuticals.</p> <p>Introduction to physiological factors affecting certain technological procedures of manufacturing and administration of drugs, introduction to controlled release drug delivery systems developed for oral and parenteral routes of administration.</p>
<p><b>Learning outcomes of Course unit:</b></p> <p><b>Upon completion of the course in Pharmaceutical Technology 2, students are expected to acquire basic knowledge about:</b></p> <ul style="list-style-type: none"> <li>• Effect of pharmaco-technological, physico-chemical and biological factors on drug release/absorption.</li> <li>• Manufacturing technology of sterile, parenteral, cytotoxic preparations and radiopharmaceuticals, as well as quality control of obtained products.</li> <li>• Review of new polymers for advanced drug delivery mechanisms, controlled drug release.</li> <li>• Microemulsions as drug carriers.</li> <li>• Application of nanoparticles, pulsatile and stimulus-responsive drug delivery systems.</li> <li>• Inhalation and intravaginal application of modern pharmaceutical formulations.</li> </ul> <p><b>At the end of the course in Pharmaceutical Technology 2, students are expected to master the following skills:</b></p> <ul style="list-style-type: none"> <li>• Preparation of various medicinal pharmaco-technological forms.</li> <li>• Skills in searching and using professional literature (pharmacopoeias, manuals, laws, internet).</li> <li>• Ability to rationally solve practical problems in the field of making medicinal forms.</li> <li>• Acquiring knowledge in the field of new drugs.</li> <li>• Ability to observe the benefits of new methods for drug administration.</li> <li>• Ability to rationally solve practical problems in the pharmaceutical industry within the new methods of drug administration.</li> <li>• Interpretation of new therapeutic systems rational application.</li> </ul>
<p><b>Course unit contents</b></p> <p><i>Theoretical and practical classes</i></p> <p><i>MODULE 1- Introduction of biopharmacy. Sterile preparations. Parenteral preparations. Radiopharmacy. Cytostatics.</i></p> <p><i>MODULE 2- Application of polymers in controlled release drug delivery systems. Hydrogels, Microparticles and Nanoparticles of medicinal substances - synthesis, properties and application.</i></p> <p><i>MODULE 3- Microemulsions as carriers of drugs. Therapeutic systems with modified drug release. Pharmaceutical forms for intravaginal and inhalation use.</i></p>

**Literature**

- Đurić Z., Farmaceutska tehnologija sa biofarmacijom, I deo, udžbenik, Nijansa, Zemun, 2004.
- Avdeef A., Absorption and Drug Development: Solubility, Permeability, and Charge State, John Wiley & Sons, Inc., 2003.
- Katzung G. Bertram, Drug Therapy, London: Prentice-Hall International, 1991.
- Jovanović M., Praktikum iz farmaceutske tehnologije sa biofarmacijom, I deo, udžbenik za praktičnu nastavu, Nijansa, Zemun, 2004.
- Troy David, Remington -The Science and Practice of Pharmacy, Baltimore: Lippincot Williams and Wilkins, 2006.
- Swabrick J, Boylan J. Encyclopedia of Pharmaceutical Technology, sec.ed.,vol. 1-3, Marcel Dekker, New York, Basel, 2002.
- Ansel Howard, Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, Lippincot Williams & Wilkins, Phyladelphia, 1995.

<b>Number of active teaching hours</b>				<b>Other classes</b>
Lectures:	Practice:	Other forms of classes:	Independent work:	
30	30			
<b>Teaching methods: Lectures in a small group, problem based learning</b>				
<b>Examination methods (maximum 100 points)</b>				
<b>Exam prerequisites</b>	<b>No. of points:</b>	<b>Final exam</b>	<b>No. of points:</b>	
Student's activity during lectures	<b>30</b>	oral examination		
practical classes/tests	<b>70</b>	written examination		
Seminars/homework		.....		
Project				
Other				

<b>Grading system</b>		
<b>Grade</b>	<b>No. of points</b>	<b>Description</b>
<b>10</b>	<b>91-100</b>	Excellent
<b>9</b>	<b>81 – 90</b>	Exceptionally good
<b>8</b>	<b>71 – 80</b>	Very good
<b>7</b>	<b>61 – 70</b>	Good
<b>6</b>	<b>51 – 60</b>	Passing
<b>5</b>	<b>&lt; 50</b>	Failing

**(Table 5.2) Course unit description**