

<b>Study program:</b> Integrated academic studies of Pharmacy
<b>Type and level of the study program:</b> integrated academic studies
<b>Course title: PHARMACOGNOSY II (PhIII-PHGII)</b>
<b>Teachers:</b> Nebojša V. Kladar, Neda S. Gavarić
<b>Course status:</b> compulsory
<b>ECTS Credits: 8</b>
<b>Condition:</b> Physiology, Pharmacognosy I
<b>Course aim</b> Students should recognize the most important medicinal raw materials of natural (vegetable, animal and mineral) origin and their active constituents. Also, they should gain the skills for the macro- and microscopic identification and characterization of certain plant drugs of importance for Medicine and Pharmacy.
<b>Expected outcome of the course:</b> Student should be able to indicate the biological source and distribution of the plant for each herbal medicine, morphological and anatomical characteristics of the drug, chemical composition and dominant compounds, as well as the pharmacological effect and use. Also, the student should be able to identify and define the drug and its biological origin, perform quality testing of drugs, as well as to be able to participate in conceiving, organizing and managing the production of drugs and ensuring its quality.
<b>Course description</b> <i>Theoretical education:</i> <ol style="list-style-type: none"> <li>1. Plants as drug sources. Quality, safety and efficacy of herbal medicines.</li> <li>2. Alkaloid drugs: parasympatholytics, spasmolytics, mydriatics, antiurics and antineuralgics.</li> <li>3. Alkaloid drugs: analgesics, parasympathomimetics, miotics, antihypertensives, cytostatics, insecticides.</li> <li>4. Alkaloid drugs: antiasthmatics, analeptics, diuretics, parasympathomimetics.</li> <li>5. Alkaloid drugs: stomachics, irritants, expectorants, emetics, amebicides, antimalarics, antihelmentics.</li> <li>6. Phenolic drugs: drugs with simple phenols.</li> <li>7. Phenolic drugs: drugs with lignans, arylhepatonids, stilbenes and xantons.</li> <li>8. Phenolic drugs: drugs with flavonoids.</li> <li>9. Phenolic drugs: drugs containing tannins, anthraquinones, cannabinoids and phloroglucinols.</li> <li>10. Essential oils and aromatic drugs.</li> <li>11. Aromatic drugs: nervina, expectorants, amaro-aromatica, spices, anti-inflammatory drugs, stomachics, carminatives, antichelintics.</li> <li>12. Drugs containing iridoids glycosides.</li> <li>13. Drugs containing diterpene and triterpene glycosides.</li> <li>14. Drugs with steroid triterpenes: phytosterols, cardenolides and bufadienolides.</li> <li>15. Drugs containing fatty oils, heterosaccharides, aminoacids and peptides.</li> </ol> <i>Practical education (labs):</i> <ol style="list-style-type: none"> <li>1. Work in the laboratory of Pharmacognosy – microscopic techniques (magnifier, light microscope, electron microscope).</li> <li>2. Drugs with non-organized structure (Amyla, Faex medicinalis, Gossypium, Lana ) - macroscopic and microscopic (histochemical) identification.</li> <li>3. Rhizomes (Filicis rhizoma, Iridis rhizoma + Iridis pulvis, Zingiberis rhizoma, Calami rhizoma, Tormentillae rhizoma, Hellebori rhizoma) - macroscopic and microscopic (histochemical) identification.</li> <li>4. Roots and rhizomes (Primulae radix et rhizoma, Gentianae radix et rhizoma, Althaeae radix, Belladonnae radix + Belladonnae pulvis, Saponariae rubrae radix et rhizoma, Ononidis radix, Petroselini radix) - macroscopic and microscopic (histochemical) identification.</li> <li>5. Tree barks and barks (Granati cortex, Frangulae cortex, Cinnamomi cortex + Cinnamomi pulvis, Quercus cortex + Quercus pulvis, Salicis cortex, Juniperi lignum) - macroscopic and microscopic (histochemical) identification.</li> <li>6. Leaves (Sennae folium + Sennae pulvis, Uvae ursi folium, Althaeae folium + Althaeae pulvis, Stramonii folium, Belladonnae folium, Betulae folium, Farfarae folium, Eucalypti folium, Oleandri folium, Olivae folium, Menthae piperitae folium + Menthae piperitae pulvis, Salviae folium, Rosmarini folium + Rosmarini pulvis, Melissa folium) - macroscopic and microscopic (histochemical) identification.</li> <li>7. Herbs (Thymi serpylli herba, Equiseti herba, Absinthii herba + Absinthii pulvis, Hyperici herba, Millefolii herba) - macroscopic and microscopic (histochemical) identification.</li> <li>8. Flowers and inflorescences (Caryophylli flos, Chamomillae flos + Chamomillae pulvis, Lavandulae flos, Malvae flos, Sambuci flos, Tiliae flos cum bracteis, Verbasci flos, Callendulae flos, Rhoedos flos) – macroscopic and microscopic (histochemical) identification.</li> <li>9. Fruits (Citri flavedo, Capsici fructus + Capsici pulvis, Foeniculi fructus, Carvi fructus, Anisi fructus + Anisi pulvis, Coriandri fructus + Coriandr pulvis, Juniperi “fructus”, Cynosbati pseudofructus) - macroscopic and microscopic (histochemical) identification.</li> <li>10. Seeds (Lini semen + Lini pulvis, Papaveris semen, Sinapis albae semen, Stramonii semen, Hippocastani semen) - macroscopic and microscopic (histochemical) identification.</li> </ol>
<b>Literature</b>

**Compulsory**

1. Heinrich M, Barnes J, Gibbons S, Williamson EM. Fundamentals of pharmacognosy and phytotherapy. Elsevier Health Sciences, 2012.
2. Bisset NG, Wichtl M. Herbal Drugs and Phytopharmaceuticals. CRC Press, Boca Raton, London, New York, Washington D.C., 2001.
3. Laboratory classes in Pharmacognosy, script for internal use. Department of Pharmacy, Faculty of Medicine, Novi Sad.

**Additional -**

<b>Number of active classes</b>				Other:
Lectures: 45	Practice: 60	Other types of teaching: -	Research related activities: -	-
<b>Teaching methods:</b> 1. Theoretical education (Lectures, Interactive Lectures). 2. Practical education (Practical Classes, Experiments)				
<b>Student activity assessment (maximally 100 points)</b>				
<b>Pre-exam activities</b>	<b>points</b>	<b>Final exam</b>	<b>points</b>	
Lectures	5	Practical	20	
Practices	10	Written	30	
Colloquium	3x5	Oral	20	
Essay	-			