



SYLLABUS OF THE EDUCATIONAL COMPONENT

INDUSTRIAL PHARMACEUTICAL PRACTICE IN PHARMACOGNOSY WITH THE BASICS OF RESOURCE SCIENCE

for higher education students the 4rd and 5th
years of full-time education educational program
«Pharmacy» specialty «226 Pharmacy,
industrial pharmacy» area of knowledge «22
Healthcare» the second (master's) level of higher
education

TEACHERS

			Information about the teacher
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- Name of higher education institution and unit:** National University of Pharmacy, Department of Pharmacognosy and Nutritiology.
- Department address:** street Valentinovskaya, 4 (4th floor of the chemical building), Kharkiv, phone: +38(0572)67-93-63.
- Web-site of the department:** <https://cnc.nuph.edu.ua/>
- Consultations:** *online, take place every Wednesday from 12.05 to 12.50*
- Abstract of the educational component:** Pharmaceutical production practice in pharmacognosy occupies an important place in the training system of future pharmacists. It is conducted at the graduation course to consolidate knowledge in pharmacognosy: acquisition of skills in the procurement, storage and processing of medicinal plant raw materials

6. Purpose of teaching the educational component "Industrial pharmaceutical practice in pharmacognosy with the basics of resource science" is training students higher education students to identify MP and morphologically similar species, to prepare MPM, to conduct primary processing, drying, and commodity analysis of MPM, which is necessary in the practical activities of a pharmacist; to provide practical skills in cultivating MP, identifying thickets of wild MP, familiarization with methods of studying MPM stocks, and to provide recommendations on the rational use of natural resources.

7. Competencies according to the educational program:

Soft-skills / General competences (GC):

GC 02. Knowledge and understanding of the subject area and understanding of professional activity

GC 03. Ability to communicate in the state language both orally and in writing.

GC 05. Ability to evaluate and ensure the quality of work performed.

GC 06. Ability to work in a team.

GC 09. Ability to use information and communication technologies.

GC 11. Ability to apply knowledge in practical situations, make informed decisions.

Hard-skills / Professional (special) competences (PC):

PC 1. Ability to integrate knowledge and solve complex pharmacy problems in broad or multidisciplinary contexts.

PC 2. Ability to collect, interpret and apply data necessary for professional activity, research and implementation of innovative projects in the field of pharmacy.

PC 3. Ability to solve pharmacy problems in new or unfamiliar environments with incomplete or limited information, taking into account aspects of social and ethical responsibility.

PC 4. Ability to clearly and unambiguously communicate one's own knowledge, conclusions and reasoning in the field of pharmacy to specialists and non-specialists, in particular to students.

PC 6. Ability to provide advice on prescription and non-prescription medicines and other pharmacy products; pharmaceutical care during the selection and sale of an over-the-counter medicinal product by assessing the risk/benefit ratio, compatibility, indications and contraindications, guided by data on the health status of a particular patient, taking into account the biopharmaceutical, pharmacokinetic, pharmacodynamic and physicochemical characteristics of the medicinal product and other pharmaceutical products.

PC 10. Ability to ensure proper storage of medicinal products and other pharmaceutical products in accordance with their physicochemical properties and the rules of Good Storage Practice (GSP) in healthcare institutions.

PC 17. Ability to carry out pharmaceutical development and participate in the production of medicinal products of natural and synthetic origin in pharmaceutical enterprises in accordance with the requirements of Good Manufacturing Practice (GMP).

PC 19. Ability to organize and carry out quality control of medicinal products of natural and synthetic origin in accordance with the requirements of the current edition of the State Pharmacopoeia of Ukraine, quality control methods, technological instructions, etc.; prevent the distribution of low-quality, falsified and unregistered medicines.

8. Programmatic learning outcomes (PLO)

PLO 1. Have and apply specialized conceptual knowledge in the field of pharmacy and related fields, taking into account modern scientific achievements.

PLO 2. Critically understand scientific and applied problems in the field of pharmacy.

PLO 3. Have specialized knowledge and skills to solve professional problems and tasks, including for the purpose of further developing knowledge and procedures in the field of pharmacy.

PLO 4. Communicate fluently in the state and English languages orally and in writing to discuss professional problems and results of activities, present scientific research and innovative projects.

PLO 5. Evaluate and ensure the quality and efficiency of activities in the field of pharmacy.

PLO 7. Collect the necessary information on the development and production of medicines, using professional literature, patents, databases and other sources; systematize, analyze and evaluate it, in particular, using statistical analysis.

PLO 8. Formulate, argue, clearly and specifically convey to specialists and non-specialists information based on their own knowledge and professional experience, the main trends in the development of world pharmacy and related industries.

PLO 9. Carry out professional activities using information technologies, "Information databases", navigation systems, Internet resources, software and other information and communication technologies.

PLO 12. Determine the advantages and disadvantages of medicines of natural and synthetic origin of various pharmacological groups, taking into account their chemical, physicochemical, biopharmaceutical, pharmacokinetic and pharmacodynamic characteristics and the type of dosage form. Recommend medicines and other pharmacy products to consumers with the provision of advisory assistance and pharmaceutical care.

PLO 17. Predict and determine the impact of environmental factors on the quality and consumer characteristics of medicinal products of natural and synthetic origin and other pharmacy products, organize their storage in accordance with their physicochemical properties and the rules of Good Storage Practice (GSP).

9. The status of the educational component: *compulsory*

10. Prerequisites of the educational component: based on the knowledge acquired by higher education students while studying Latin, botany, organic chemistry, biological chemistry, analytical chemistry, biophysics, physical and colloidal chemistry, normal and pathological human physiology

11. The scope of the educational component: 90 hours 3 credits ECTS: *90 zод hours of independent work.*

12. Organisation of the teaching process:

Teaching methods:

- *explanatory (informational and reproductive) method:* Lecture-based learning □ lectures, video materials;
- *reproductive method:* traditional practical classes;
- *problem-based teaching:* Brainstorming - method of "brainstorming"; Case-based learning - method of cases;
- *partial search method:* Game-based learning □ game methods of learning (business games);
- *research method:* Research-based learning □ participation in research work, preparation of theses of reports at conferences, scientific articles

The content of the educational component:

Module 1: Acquisition of skills in the procurement, storage and processing of medicinal plant raw materials and raw materials used in pharmacy, care of cultivated medicinal plants and plants used in pharmacy. Determination of stocks of medicinal plants, rational use of natural resources.

Content module № 1. Procurement, storage and processing of medicinal plant materials and raw materials used in pharmacy.

Topic 1. Acquaintance with the program, calendar, tasks and practice base.

Topic 2. Acquaintance with wild medicinal plants in various phytocenoses. Morphological description and definition of medicinal plants. Herbalization of medicinal plants.

Topic 3. Acquaintance with the organization of procurement of MPM. Mastering the methods of harvesting, drying, bringing MPM to a standard state, packing and labeling MPM.

Topic 4. Mastering the express method of phytochemical analysis. Commodity analysis of a sample of MPM prepared individually.

Content module № 2. Care of cultivated medicinal plants and detection of thickets of wild medicinal plants

Topic 5. Acquaintance with the main cultivated medicinal plants and methods of their cultivation.

Topic 6. Introduction to the basics of studying wild medicinal plant stocks for the purpose of rational use of natural resources of the Republic of Latvia and their protection.

Organization of independent work:

Independent work includes studying issues on the topics of the educational component that were not included in classroom lessons, and completing tasks on these issues in order to consolidate theoretical material.

13. Forms of progress and semester supervision of academic achievements

Types and forms of control:

Current control:

Control of content modules: oral interview, writing test tasks.

Semester control:

Form of semester control: differential test

Conditions for admission to semester control: current rating of more than 60 points, presence of a minimum number of points for control of content modules 1 and 2, absence of unworked absences of laboratory classes, fulfillment of all requirements stipulated by the work program of the educational component.

14. Criteria and the procedure for assessing learning outcomes

Assessment of the acquisition of topics of the educational component during classes:

<i>Types of work for which the applicant receives points</i>	<i>Distribution of the maximum number of points per topic (lesson) by type of work</i>	<i>The maximum number of points by control content module</i>
<i>Content module 1</i>		
testing	25	50
oral answer	25	
<i>Content module 3</i>		
testing	25	50
oral answer	25	
<i>Total points for the content modules:</i>		<i>100</i>

Assessment of individual work of a higher education applicant:

during content module 1 control: tickets for content module 1 include theoretical questions and test tasks from topics 1-4.

during content module 2 control: tickets for content module 1 include theoretical questions and test tasks from topics 5-6.

Evaluation scale of the semester credit:

When studying the educational component, several assessment scales are used: a 100-point scale, an undifferentiated ("passed", "not passed") two-point scale and the ECTS rating scale. The results are converted from one scale to another according to the table.

Total points by a 100-point scale	ECTS rating scale	Assessment by a four-point scale	Assessment by an undifferentiated scale
90-100	A	Excellent	passed
82-89	B	Good	
74-81	C	Satisfactory	
64-73	D		
60-63	E	Unsatisfactory	failed
35-59	FX		
1-34	F		

15. Educational component policies:

Academic Integrity Policy. It is based on the principles of academic integrity stated in the Provisions of the document

"On measures to prevent cases of academic plagiarism at the NUPh". Writing off during the assessment of the success of a higher education student during control activities in practical (seminar, laboratory) classes, control of content modules and the semester exam is prohibited (including with the use of mobile devices). Abstracts must have correct text references to the used literature. The detection of signs of academic dishonesty in the student's written work is a reason for the teacher not to enroll it.

Class attendance policy. A student of higher education is obliged to attend classes (Provisions of the document "On the organization of the educational process of the NUPh") according to the schedule (<https://nuph.edu.ua/rozklad-zanyat/>), to observe ethical norms of behavior.

Policy regarding deadlines, working out, rating increase, liquidation of academic debt. The completion of missed classes by a student of higher education is carried out in accordance with the Provisions of the document "Regulations on the completion of missed classes by students and the procedure for eliminating academic differences in the curricula of the NUPh" in accordance with the schedule for making up missed classes established by the department. Increasing the rating and liquidating academic debt from the educational component is carried out by the students in accordance with the procedure specified in the Provisions of the document "On the procedure for evaluating the results of training of students of higher education at the NUPh".

Applicants of higher education are obliged to comply with all deadlines set by the department for the completion of written works from the educational component. Works that are submitted late without valid reasons are assessed at a lower grade - up to 20% of the maximum number of points for this type of work.

Policy on appeals of assessment from the educational component (appeals). Applicants of higher education have the right to contest (appeal) the evaluation of the educational component obtained during control measures. The appeal is carried out in accordance with the POL "Regulations on appealing the results of the semester control of the knowledge of students of higher education at the National University of Pharmacy".

Policy on the recognition of learning outcomes obtained through non-formal and/or informal education by higher education students. Applicants of higher education have the right to recognition of learning outcomes acquired in informal and informal education in accordance with the POL "On the Procedure for Recognition of Learning Outcomes Acquired through Non-Formal and/or Informal Education by Applicants of Higher Education at the National University of Pharmacy".

As part of the academic freedom of the teacher, instead of performing types of work on the subject of the educational component, it is possible to enroll in the non-formal education of a student of higher education.

16. Information and methodological support of the educational component:

Required reading	Pharmacognosy: textbook for higher school students / V.S. Kyslychenko, L.V. Upyr, Ya.V. Dyakonova, V.Yu. Kuznetsova, I.G. Zinchenko, O.A. Kyslychenko; ed. by V.S. Kyslychenko. – Kharkiv :
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	<p>NUPh : GoldenPages, 2011. – 552 p.; il.</p> <p>2. Pharmacognosy: textbook for students of higher / V.S. Kyslychenko, L.V. Lenchyk, I.G. Gurieva et al.; ed. by V.S. Kyslychenko. – Kharkiv : NUPh : Golden Pages, 2019. – 584 p.</p> <p>3. Medicinal plants resource science : handbook for students of higher schools / V.S. Kyslychenko, L.V. Upyr, I.G. Zinchenko, O.A. Kyslychenko, S.I. Stepanova; ed. by V.S. Kyslychenko. – Kharkiv : NUPh : Golden Pages, 2012. – 168 p.</p>
Additional literature for in-depth study of the educational component	<p>1. Text book of Pharmacognosy and Phytochemistry / A. Dhole, V. Dhole, V. Yeligar, Ch. Magdum. Pharma Career Publication, 2019. – 778 p.</p> <p>2. Gokhale S. B., Kokate C. K., Purohit A. P. A textbook of Pharmacognosy. 29th Edition. 2017. 284 p.</p> <p>3. Kumar N. A Textbook Of Pharmacognosy. A.I.T.B.S. Publishers, India. 2010. 502 p.</p> <p>4. Shah B. N., Seth A.K. Textbook of Pharmacognosy and Phytochemistry. Elsevier. 2010. 587 p.</p> <p>5. Singh A. A Textbook of Pharmacognosy. Pharma Book Syndicate. 2013. 836 p.</p> <p>6. British Pharmacopoeia Commission, 2016. British Pharmacopoeia. London: TSO.</p> <p>7. European Pharmacopoeia. 8th ed including supplements 1 (2014), 2 (2014), 3 (15), 4 (15), 5(2015). Council of Europe, Strasbourg, France. 2014.</p> <p>8. Textbook of Pharmacognosy and Phytochemistry - E-Book / Shah B., Seth A. – Elsevier Health Sciences, 2012. – 620 p.</p>
Up-to-date electronic information resources (journals, websites, etc.) for in-depth study of the educational component	<p>1. Website of the Department of Pharmacognosy and Nutriciology – www.cnc.nuph.edu.ua</p> <p>2. Website of the NUPh library – http://lib.nuph.edu.ua</p> <p>3. Electronic archive of the NUPh – http://dspace.nuph.edu.ua</p> <p>4. Center for Distance Technologies of the National Academy of Sciences of Ukraine – pharmel.kharkiv.edu</p> <p>5. NUPh. Online tests – http://tests.nuph.edu.ua</p> <p>6. Vernadsky National Library of Ukraine – http://www.nbu.gov.ua</p> <p>7. V.G. Korolenko Kharkiv State Scientific Library – http://korolenko.kharkov.com</p> <p>8. Міністерство охорони навколишнього природного середовища та ядерної безпеки України - http://regulation.gov.ua/catalogue/regulators/id191/npa/page-3</p> <p>9. The National Center for Biotechnology Information advances science and health - http://www.ncbi.nlm.nih.gov/pubmed</p>
Moodle distance learning system	https://pharmel.kharkiv.edu/moodle/course/view.php?id=2271

17. Material and technical support and software of the educational component: computers for testing, multimedia device, screen.
 Software: Microsoft Word, Excel, Power Point, Acrobat rider, Google Workspace for Education Standard, ZOOM, MOODLE.