SYLLABUS
Fall semester 2024-2025 academic years
on the educational program "6B05101-Biological engineering"

ID and title of discipline	Independent work of students (IWS)	Number of credits			General number of credits	Independent work of student with teacher (IWST)
		Lectures (L)	Practical classes (PC)	Sem. classes (SC)		
106011 Metabolites of plant origin	5	1,7	0	3,3	5	6

Academic course information				
Form of education	**Cycle, module component**	**Types of Ltures**	**Types of practical training**	**Form of final control**
off-line	Professional / theoretical	Information with visualization	Seminar works	Oral (Offline)
Lecturer	Inelova Z.A., Cand. Biol. Sc., professor			
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ACADEMIC COURSE PRESENTATION

Purpose of the course	Expected Learning Outcomes (LO)	Indicators of LO achievement (ID)
In result of this course the students will be able to recognize the major group of different medicinal plants of Kazakhstan, to divide them according their biochemical active constituents, application and taxonomic groups .	1. to identify medicinal plants (family/genus/species-level)	1.1 indicate the name of family and species of the well-known medicinal plants of the world. 1.2 indicate the utilization of the well-known medicinal plants of the world.
	2. to determine the name and to understand the effects of plant chemical constituents on humans.	2.1 to know the names of chemical constituents of well-known medicinal plants 2.2 to indicate the effects of well-known medicinal plants on humans
	3. Be able to clearly and logically articulate their ideas in oral presentation	3.1. have skills to write annotated list or table. 3.2 have skills to prepare and to introduce a presentation
	4. Be able to find reliable information about anatomy and morphology plants in the library or on the internet	4.1 to have skills to find reliable scientific information in Internet 4.2 to have skills to work with Microsoft Office for preparing of presentations
Prerequisites	plant systematics, plant anatomy and morphology	
Post requisites	Organization and Planning of Scientific Research	
Learning Resources	**Literature:** The main sources: Laurel M. Medicinal Plants. – 2020. – 122 p. Hoffmann D. Medical herbalism. The Science and Practice of Herbal Medicine. – 2003. -675 p. Shah B.N., Seth A.K. Textbook of pharmacognosy and phytochemistry. – 2010- 587 p Muravyova D.A. Pharmacognosy (with the basics of biochemistry of medicinal plants). - Moscow, 1978 .-- 656 p.[in Russian] Grudzinskaya L.M., Gemedzhieva N.G., Nelina N.V., Karzhaubekova Zh.Zh. Annotated list of medicinal plants in Kazakhstan: reference edition. - Almaty. - T. 20 (1). - 2014 - 200 p. [in Russian] Additional sources: Abdulina S.A. Checklist of vascular plants of Kazakhstan. – Almaty, 1998. – p. 187. Illustrated guide to plants of Kazakhstan. Тт.1-2. Alma-Ata 1966 [in Russian] Flora of Kazakhstan. Vol. 1-9. - Alma-Ata [in Russian] **Research infrastructure** **Internet resources:**	

	http://elibrary.kaznu.kz/ru/ https://www.plantarium.ru/ **Available online:** Additional training materials and documentation for botany used for homework and projects will be available on your page on univer.kaznu.kz in EMCD.
Academic policy of the course	The academic policy of the course is determined by the Academic Policy and the Policy of Academic Integrity of Al-Farabi Kazakh National University . Documents are available on the main page of IS Univer . **Integration of science and education.** The research work of students, undergraduates and doctoral students is a deepening of the educational process. It is organized directly at the departments, laboratories, scientific and design departments of the university, in student scientific and technical associations. Independent work of students at all levels of education is aimed at developing research skills and competencies based on obtaining new knowledge using modern research and information technologies. A research university teacher integrates the results of scientific activities into the topics of lectures and seminars (practical) classes, laboratory classes and into the tasks of the IWST, IWS, which are reflected in the syllabus and are responsible for the relevance of the topics of training sessions and assignments. **Attendance.** The deadline for each task is indicated in the calendar (schedule) for the implementation of the content of the course. Failure to meet deadlines results in loss of points. **Academic honesty**. Practical/seminar classes, IWS develop the student's independence, critical thinking, and creativity. Plagiarism, forgery, the use of cheat sheets, cheating at all stages of completing tasks are unacceptable. Compliance with academic honesty during the period of theoretical training and at exams, in addition to the main policies, is regulated by the "Rules for the final control" , "Instructions for the final control of the autumn / spring semester of the current academic year" , "Regulations on checking students' text documents for borrowings". **The Basic Principles of Inclusive Education**. The educational environment of the university is conceived as a safe place where there is always support and equal attitude from the teacher to all students and students to each other, regardless of gender, race / ethnicity, religious beliefs, socio-economic status, physical health of the student, etc. All people need the support and friendship of peers and fellow students. For all students, progress is more about what they can do than what they can't. Diversity enhances all aspects of life. All students, especially those with disabilities, can receive counseling assistance by phone/e-mail 87016207040/karime_58@mail.ru or via video communication in MS Teams. **Integration of MOOC (massive open online course).** In the case of integrating MOOC into the course, all students need to register for MOOC. The deadlines for passing MOOC modules must be strictly observed in accordance with the course study schedule. **ATTENTION!** The deadline for each assignment is specified in the calendar (schedule) of the implementation of the discipline content, as well as in the MOOC. Failure to comply with deadlines leads to a loss of grades.

INFORMATION ABOUT TEACHING, LEARNING AND ASSESSMENT

Score-rating letter system of assessment of accounting for educational achievements				Assessment methods
Grade	Digital equivalent of grades	points, % content	Assessment according to the traditional system	
A	4,0	95-100	Great	**Criteria-based assessment** is the process of comparing the actual learning outcomes with the expected learning outcomes based on clearly defined criteria. It is based on formative and summative assessment. **Formative assessment** is a type of assessment that is carried out during everyday learning activities. It is a current indicator of academic performance. It provides an operational relationship between the student and the teacher. It allows you to determine the student's capabilities, identify difficulties, help achieve the best results, and promptly adjust the educational process for the teacher. The assessment includes the completion of assignments, activity in the classroom during lectures, seminars, and practical classes (discussions, quizzes, debates, round tables, laboratory work, etc.). The acquired knowledge and competencies are assessed. **Summative assessment** is a type of assessment that is carried out upon completion of the study of a section in accordance with the discipline program. It is carried out 3-4 times per semester when performing IWS. This is an assessment of the development of expected learning outcomes in relation to descriptors. It allows you to determine and record the level of mastery of the discipline for a certain period. The learning outcomes are assessed
A-	3,67	90-94		
B+	3,33	85-89	Fine	
B	3,0	80-84		
B-	2,67	75-79		
C+	2,33	70-74		

Formative and summative assessment	Grades, % content

C	2,0	65-69	Satisfactory	Activity at Lectures	0
C-	1,67	60-64		Work in seminar classes	10
D+	1,33	55-59		Independent work	30
D	1,0	50-54		Design and creative activities	0
FX	0,5	25-49	Unsatisfactory	Final control (exam)	60
F	0	0-24		**Totaly**	100

Calendar (schedule) for the implementation of the content of the course. Methods of teaching and learning

A week	Topic name	Number of hours	Max. ball
	Module 1 Botany		
1	**L 1.** Introduction, utilization and history of medicinal plants.	1	
1	**SC 1** Traditional Medicine in East and South Asia. Traditional Medicine in the Americas and in Africa.	2	10
2	**L 2** Classification of medicinal plants	1	
2	**SC 2** Traditional Medicine of the Mediterranean. The Humoral System: Fifteen Centuries of Medical Doctrine. European Medical Practice: Mysticism and the Doctrine of Signatures. Empiricism in Medicine. The Scientific Method. Medical Traditions in Perspective	2	10
2	**IWST 1** Consultation on the implementation of IWS1	0,5	
3	**L 3** Phytochemical basis of medicinal plants. Carbohydrates.	1	
3	**SC 3** Polysaccharides from Medicinal Plants based on the article "Polysaccharides from Medicinal Plants: Bridging Ancestral Knowledge with Contemporary Science" https://www.mdpi.com/2223-7747/13/13/1721/ Olive oil as source of Omega-6 fatty acids https://www.betterhealth.vic.gov.au/health/healthyliving/fats-and-oils	2	10
3	**IWS 1** Semina Plantaginis psyllii. Gummi tragacanthae. Description, sources, and utilization.		15
4	**L 4** Phytochemical basis of medicinal plants. Lipids.	1	
4	**SC 4** Medicinal plants containing inulin. Make up a list of them, write their description, and indicate habitats, utilization.	2	10
4	**IWST 2** Consultation on the implementation IWS 2.		
5	**L 5** Phytochemical basis of medicinal plants. Polyphenols.	1	
5	**SC 5** Almond oil, castor oil, corn oil, olive oil, and safflower oil. . Description, sources, and utilization.	2	10
5	**IWS 2** Tubera Salep. Description, sources, and utilization.		15
6	**L 6** Phytochemical basis of medicinal plants. Terpenes.	1	
6	**SC 6** Medicinal plants containing terpenes. Make up a list of them, write their description, and indicate habitats, utilization.	2	10
6	**IWST 3** Consultation on the implementation of IWS 3.		
7	**L 7** Phytochemical basis of medicinal plants. Glycosides.		
7	**SC 7** Medicinal plants containing cardiac glycosides. Make up a list of them, write their description, and indicate habitats, utilization.		
Midterm control 1			**100**
8	**L 8** Phytochemical basis of medicinal plants. Alkaloids.	1	
8	**SC 8** Coumarin and furanocoumarin glycosides. Main medicinal plants containing them. Description, habitats, and utilization.	2	10
8	**IWS 3** Saponin glycosides. Main medicinal plants containing them. Description, habitats, and utilization.		9
9	**L 9** Phytochemical basis of medicinal plants. Volatile oils.	1	
9	**SC 9** Anthraquinone glycosides. Main medicinal plants containing them. Description, habitats, and utilization.	2	10
9	**IWST 4** Consultation on the implementation of IWS 4.		
10	**L 10** Medicinal plants containing flavonoids.	1	
10	**SC 10** Tropane alkaloids. Main medicinal plants containing them. Description, habitats, and utilization.	2	10
10	**IWS 4** Quinoline alkaloids and isoquinoline alkaloids. Description, utilization. Main sources.		9
11	**L 11** Vitamins and vitamins containing plants.	1	
11	**SC 11** Volatile oils containing alcohols. Description, utilization. Main sources.	2	9
12	**L 12** Medicinal plants containing tannins.	1	

12	**SC 12.** Volatile oil containing ether. Description, utilization. Main sources.	2	9
12	**IWST 5.** Consultation on the implementation of IWS 5.		
13	**L 13** Enzymes of plant origin.	1	
13	**SC 13** Volatile oil containing ester. Description, utilization. Main sources.	2	9
13	**IWS 5** Annotated list of rare medicinal plants of Kazakhstan, their inhabitation, utilization and samples of remedies. Conservation and protection.		
14	**L 14** Medicinal plants containing resins.	1	
14	**SC 14** Fibres and Absorbents. Description, utilization. Main sources.	2	9
15	**L 15** Poisonous Plants and Toxicity of herbal constituents.	1	
15	**SC 15.** Medicinal plants of Central Asia. Make up a list of them, write their description, and indicate habitats, utilization,	2	9
15	**IWST 6.** Consultation on the implementation of exam task.		
Level control 2			**100**
Final control (exam)			**100**
TOTAL for discipline			**100**

Dean _____ M.S. Kurmanbayeva

Chairman of the Academic Committee
on Quality of Teaching and Learning _____ L.K. Baktybaeva

Head of Department _____ A.S. Nurmahanova

Lecturer _____ Z.A. Inelova

RUBRICATOR OF THE SUMMATIVE ASSESSMENT

CRITERIA EVALUATION OF LEARNING OUTCOMES

IWS 1. Task name "Diversity of algae and fungi, their value, utilization", divided into 7 subtopics in accordance to the proposed scientific articles
Format: presentation in PDF format
Implementation: individual

Criterion	**"Excellent"** **Max. weight in %**	**"Good"** **Max. weight in %**	**"Satisfactory"** **Max. weight in %**	**"Unsatisfactory"** **Max. weight in %**
	95-100	**80-94**	**65-79**	**<64**
Full understanding of the article	Full reflection of the article content in the presentation	Simplified reflection of the article content in the presentation	Limited understanding of the article's content	The content of the presentation does not correspond to the article
Presentation design	The title slide and the last one are designed in accordance with the requirements of the "Methodological recommendations for the implementation of IWS"	Making a presentation in PPT format	there is no title slide or no references	Presentation without a title slide and references
Number of slides	15 and >	12-13	10-11	< 10

IWS 2. Task name "Diversity of gymnosperms and angiosperms", divided into 7 subtopics in accordance to the proposed scientific articles
Format: presentation in PDF format
Implementation: individual

Criterion	**"Excellent"** **Max. weight in %**	**"Good"** **Max. weight in %**	**"Satisfactory"** **Max. weight in %**	**"Unsatisfactory"** **Max. weight in %**
	95-100	**80-94**	**65-79**	**<64**
Full understanding of the article	Full reflection of the article content in the presentation	Simplified reflection of the article content in the presentation	Limited understanding of the article's content	The content of the presentation does not correspond to the article
Presentation design	The title slide and the last one are designed in accordance with the requirements of the "Methodological recommendations for the implementation of IWS"	Making a presentation in PPT format	there is no title slide or no references	Presentation without a title slide and references
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