

al -Farabi Kazakh National University
Faculty of Biology and Biotechnology
Department of Biodiversity and Bioresources



APPROVED
Dean of the Faculty
Kurmanbayeva M.S.
«_____» «_____» 2024

EDUCATIONAL AND METHODOLOGICAL COMPLEX OF DISCIPLINE

Botany 101559
Educational program «6B10102 – Pharmacy»

Course 1
Semester 2
Number of credits 5 (5 ECTS)

Almaty, 2024

The educational and methodological complex of discipline was completed by Zaparina Ye., Senior Lecturer of department of Biodiversity and Bioresources and

Confirmed and approved at the meeting of the Department of Biodiversity and Bioresources

From «15» «05» 2024, Protocol №22

Head of the Department of
Biodiversity and Bioresources



Nurmakhanova A.S.

Confirmed and approved at the meeting of the methodical council of Biology and Biotechnology Faculty

From «28» «05» 2024, Protocol №11

Dean



Kurmanbayeva M.S.

SYLLABUS
Spring semester 2024-2025 academic year
Educational program "Botany"

1.	ACADEMIC INFORMATION ABOUT THE SUBJECT			
1.1	Faculty/school: Higher school of medicine		1.6	Number of credits (ECTS): General number of credits: 5 lecture 1.7 / practical classes 3.3
1.2	Educational program (EP): 6B10102 Pharmacy		1.7	Prerequisites: Course of Biology in school
1.3	Agency and year of EP accreditation ASIIN 2030		1.8	Independent work of the student: 4
1.4	Name of subject: Botany		1.9	Independent work of the student under the guidance of a teacher (IWST): 6
1.5	Subject ID: 91162		1.10	Mandatory component (yes – no) CD, University component
2.	Description of subject			
	Features of the structure of the plant organism and its reproduction; the importance of phytodiversity for the sustainability of the biosphere, methods of observation, description, identification, classification. Differences between various systematic groups of plants. The main methods of collecting biological information in the field and laboratory conditions, the simplest equipment and materials used in the study of biological objects. Methods for studying biological objects and systems.			
3	Purpose of subject			
	The formation of basic concepts of the anatomical and morphological structure of individual organs of plants, dependence of the structure on the function, symptoms and causes improvements in the phylogeny of plants, as well as the terms and concepts of the course.			
4.	Learning outcomes (LO) of subject			
	LO of subject		LO according to the educational program, with which the LO is associated by subject	
	1. describe the connection between the anatomical and morphological structures of higher and lower plants, illustrating with relevant examples, and highlight their practical applications in medicine, using appropriate terms and definitions;		LO1. demonstrate understanding and application of knowledge of the anatomical, morphological and species-specific characteristics of medicinal plants to assess their pharmacological potential, ensure quality identification, and develop evidence-based therapeutic applications;	
	2. analyze and utilize the anatomical, morphological characteristics of plants to evaluate their pharmacological potential and application in medicine;			
	3. independently locate, evaluate, and synthesize educational and scientific information relevant to scenarios associated with the course material.;			
	4. collaborate effectively in a team, articulate and defend your viewpoint with well-founded arguments, respect and consider others' perspectives, and appropriately give and receive			

	feedback using interpersonal and group communication skills		
5.			Formative assessment methods:
5.1	Test for understanding and application	5.4	Written survey
5.2	Video, research work - thesis, report, article - assessment of the creative task.	5.5	Colloquium: written survey
5.3	Oral questioning	5.6	Exam – test, creative task

6.	Detailed information about the subject		
6.1	Academic year: 2024-2025	6.3	Schedule (days of classes, time): From 14.00 to 17.00
6.2	Semester:2	6.4	Location (academic building, office, platform and link to the training meeting using DOT): Educational building al-Farabi 71/19
7.	Teacher		
Position	Full Name	Contact information (tel., e-mail)	Time for consultations or by appointment
Teacher/teachers	Zaparina Yelena	Zaparina.elena06@gmail.com	Before the exam session within 60 minutes
8.	Subject content		
Week #	Topics and tasks	Hours	
1	1.1 Practical lesson: The structure of the plant cell. Membrane bound & non-membrane bound organelles. Literature for reading: Basic: Shipunov A. Introduction to Botany. 2018. – 181 p. Nesterova S.G., Aidosova S.S., Pankin I.G. Laboratory course on «Biodiversity of plants»: educational textbook. – Almaty:Kazakh University, 2014. – 142 p. Torsykbaeva B.B.Anatomy and morphology o f highest plant: textbook / B. B. Torsykbaeva. - Almaty : Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8 Additional: Michael G. Simpson Plant Systematics (Third Edition). - 2018. – 774 p. ebook Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. - 2011. – 716 p. IWST: Consultation and discussion, checking the progress of the IWS	3	
2	2.1 Practical lesson: The structure of the plant tissues. Literature for reading: Basic: Shipunov A. Introduction to Botany. 2018. – 181 p. Nesterova S.G., Aidosova S.S., Pankin I.G. Laboratory course on «Biodiversity of plants»: educational textbook. – Almaty:Kazakh University, 2014. – 142 p. Torsykbaeva B.B.Anatomy and morphology o f highest plant : textbook / B. B. Torsykbaeva. - Almaty : Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8 Additional: Michael G. Simpson Plant Systematics (Third Edition). - 2018. – 774 p. ebook Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. - 2011. – 716 p. IWST: Consultation and discussion, checking the progress of the IWS1	3	

3	3.1 Practical lesson: Morphological and anatomical structure of the root. Literature for reading: Basic: Shipunov A. Introduction to Botany. 2018. – 181 p. Nesterova S.G., Aidosova S.S., Pankin I.G. Laboratory course on «Biodiversity of plants»: educational textbook. – Almaty:Kazakh University, 2014. – 142 p. Torsykbaeva B.B. Anatomy and morphology of highest plant : textbook / B. B. Torsykbaeva. - Almaty : Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8 Additional: Michael G. Simpson Plant Systematics (Third Edition). - 2018. – 774 p. ebook Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. – 2011. – 716 p. IWS1: The importance of plants in pharmacy and medicine	3
4	4.1 Practical lesson: Morphological and anatomical structure of the stem. Literature for reading: Basic: Shipunov A. Introduction to Botany. 2018. – 181 p. Nesterova S.G., Aidosova S.S., Pankin I.G. Laboratory course on «Biodiversity of plants»: educational textbook. – Almaty:Kazakh University, 2014. – 142 p. Torsykbaeva B.B. Anatomy and morphology of highest plant : textbook / B. B. Torsykbaeva. - Almaty : Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8 Additional: Michael G. Simpson Plant Systematics (Third Edition). - 2018. – 774 p. ebook Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. – 2011. – 716 p. IWS2: Consultation and discussion, checking the progress of the IWS1	3
5	5.1 Practical lesson: Morphological and anatomical structure of the leaf. Literature for reading: Basic: Shipunov A. Introduction to Botany. 2018. – 181 p. Nesterova S.G., Aidosova S.S., Pankin I.G. Laboratory course on «Biodiversity of plants»: educational textbook. – Almaty:Kazakh University, 2014. – 142 p. Torsykbaeva B.B. Anatomy and morphology of highest plant : textbook / B. B. Torsykbaeva. - Almaty : Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8 Additional: Michael G. Simpson Plant Systematics (Third Edition). - 2018. – 774 p. ebook Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. – 2011. – 716 p. IWS3: Consultation and discussion, checking the progress of the IWS2	3
6	6.1 Practical lesson: Shoots and their modifications in higher plants Literature for reading: Basic: Shipunov A. Introduction to Botany. 2018. – 181 p. Nesterova S.G., Aidosova S.S., Pankin I.G. Laboratory course on «Biodiversity of plants»: educational textbook. – Almaty:Kazakh University, 2014. – 142 p. Torsykbaeva B.B. Anatomy and morphology of highest plant : textbook / B. B. Torsykbaeva. - Almaty : Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8 Additional: Michael G. Simpson Plant Systematics (Third Edition). - 2018. – 774 p. ebook Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. – 2011. – 716 p.	3

	011. – 716 p.	
	IWS2: Biologically active substances of medicinal plants	
7	7.1 Practical lesson: The vegetative organs of higher plants and their modifications	3
	Literature for reading: Basic: Shipunov A. Introduction to Botany. 2018. – 181 p. Nesterova S.G., Aidosova S.S., Pankin I.G. Laboratory course on «Biodiversity of plants»: educational textbook. – Almaty:Kazakh University, 2014. – 142 p. Torsykbaeva B.B. Anatomy and morphology of highest plant : textbook / B. B. Torsykbaeva. - Almaty : Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8 Additional: Michael G. Simpson Plant Systematics (Third Edition). - 2018. – 774 p. ebook Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. – 2	
	Current control 1	
8	8.1 Practical lesson: The generative organs of higher plants and their modifications	3
	Literature for reading: Basic: Shipunov A. Introduction to Botany. 2018. – 181 p. Nesterova S.G., Aidosova S.S., Pankin I.G. Laboratory course on «Biodiversity of plants»: educational textbook. – Almaty:Kazakh University, 2014. – 142 p. Torsykbaeva B.B. Anatomy and morphology of highest plant : textbook / B. B. Torsykbaeva. - Almaty : Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8 Additional: Michael G. Simpson Plant Systematics (Third Edition). - 2018. – 774 p. ebook Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. – 2	
	IWS4: Consultation and discussion, checking the progress of the IWS3	
9	9.1 Practical lesson: The general characteristics of Algae	3
	Literature for reading: Basic: Shipunov A. Introduction to Botany. 2018. – 181 p. Nesterova S.G., Aidosova S.S., Pankin I.G. Laboratory course on «Biodiversity of plants»: educational textbook. – Almaty:Kazakh University, 2014. – 142 p. Torsykbaeva B.B. Anatomy and morphology of highest plant : textbook / B. B. Torsykbaeva. - Almaty : Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8 Additional: Michael G. Simpson Plant Systematics (Third Edition). - 2018. – 774 p. ebook Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. – 2	
	IWS3: The Application of Medicinal Plants in the Treatment of Various Diseases	3
10	10.1 Practical lesson: The general characteristics of the Fungi	3
	Literature for reading: Basic: Shipunov A. Introduction to Botany. 2018. – 181 p. Nesterova S.G., Aidosova S.S., Pankin I.G. Laboratory course on «Biodiversity of plants»: educational textbook. – Almaty:Kazakh University, 2014. – 142 p.	

	Torsykbaeva B.B. Anatomy and morphology of highest plant : textbook / B. B. Torsykbaeva. - Almaty : Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8 Additional: Michael G. Simpson Plant Systematics (Third Edition). - 2018. - 774 p. ebook Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. - 2	
	IWST5: Consultation and discussion, checking the progress of the IWS3	
11	11.1 Practical lesson: The general characteristics of higher spore plants..	3
	Literature for reading: Basic: Shipunov A. Introduction to Botany. 2018. - 181 p. Nesterova S.G., Aidosova S.S., Pankin I.G. Laboratory course on «Biodiversity of plants»: educational textbook. - Almaty: Kazakh University, 2014. - 142 p. Torsykbaeva B.B. Anatomy and morphology of highest plant : textbook / B. B. Torsykbaeva. - Almaty : Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8 Additional: Michael G. Simpson Plant Systematics (Third Edition). - 2018. - 774 p. ebook Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. - 2	
	IWST6: Consultation and discussion, checking the progress of the IWS4	
12	12.1 Practical lesson: The general characteristics of flowering plants. Dicot.	3
	Literature for reading: Basic: Shipunov A. Introduction to Botany. 2018. - 181 p. Nesterova S.G., Aidosova S.S., Pankin I.G. Laboratory course on «Biodiversity of plants»: educational textbook. - Almaty: Kazakh University, 2014. - 142 p. Torsykbaeva B.B. Anatomy and morphology of highest plant : textbook / B. B. Torsykbaeva. - Almaty : Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8 Additional: Michael G. Simpson Plant Systematics (Third Edition). - 2018. - 774 p. ebook Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. - 2	
	IWS4: Prospects for the Use of Medicinal Plants in Pharmacology	
13	13.1 Practical lesson: The general characteristics of Monocots	3
	Literature for reading: Basic: Shipunov A. Introduction to Botany. 2018. - 181 p. Nesterova S.G., Aidosova S.S., Pankin I.G. Laboratory course on «Biodiversity of plants»: educational textbook. - Almaty: Kazakh University, 2014. - 142 p. Torsykbaeva B.B. Anatomy and morphology of highest plant : textbook / B. B. Torsykbaeva. - Almaty : Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8 Additional: Michael G. Simpson Plant Systematics (Third Edition). - 2018. - 774 p. ebook Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. - 2.	3
14	14.1 Practical lesson: Rare, endemic species of plants in Kazakhstan.	3

	Literature for reading: Basic: Red Book of Kazakhstan. Vol. 2, part 1: Plants. - Almaty: ArtPrintXXI, 2014. -605 p.	
15	15.1 Practical lesson: Medicinal Plants and Their Pharmacological Applications	3
	Literature for reading: Basic: C.O. Moro, G. Basile Obesity and medicinal plants // Fitoterapia. – 2000. - Vol 71, No 1. – P.73-82. Marelli M. Medicinal Plants // - Plants (Basel). 2021 2;10(7):1355. doi: 10.3390/plants10071355	
	Current control 2	
9.	Teaching methods of the subject* Lecture, Case based Learning (CBL) - individual, group, streaming; integrated, project method (individual, group), work discussion, TeamBasedLearning (TBL), conferences, solving typical / situational problems.	
10.	Methods of formative assessment: test, interactive test, self-assessment test, blitz survey, peer evaluation/commenting.	
11.	Summative assessment methods (from point 5): Written control (short essay) current / intermediate / final control: learning outcomes No. 1-3 Interview / oral test - current / intermediate / final control: learning outcomes No. 1-4 Testing (open and closed questions) with situational tasks current control: learning outcomes No. 1-3 Group problem solving (cases) - current control: learning outcomes No. 2-4 Direct Observation - Monitoring / SIW: Learning Outcomes No. 3	
10.	Summative assessment	

#	Type of educational activity	Date	Points	as a percentage %
1	Lecture	According to the schedule	-	Not graded
2	Practical lesson (current control) 1. Written control 2. Oral questioning 3. Individual / Group tasks 4. Tests 5. Solution of typical / situational problems (chemistry)	According to the schedule	7 points for lesson	7 % of IE1 (100%) (7 weeks x 7 points = 49 points)
	SIW 1. Teamwork 2. Presentation 3. Creative task	According to the schedule, on the 3 th and 6 th weeks	26 points	(2 weeks * 13 points = 26 points)
	Current control 1 Written control	According to the schedule, on the 7 th week	25 points	25% of IE1 (100%)
	IE1	7 th week	100 points, cumulative	30% of the final grade for the discipline
3	Practical lesson (current control) 1. Written control 2. Oral questioning	According to the timetable	7 points for lesson	7% of IE2 (100%) (8 weeks x 7 points = 56 points)

	3. Individual / Group tasks			
	IWS 1	According to the schedule, on the 9 th week and 12 th	20 points	(2 weeks * 10 points = 20 points) IE2
	Current control Written control	According to the schedule, on the 15 th week	24 points (biology)	24% out of IE2
	IE2	15 th week	100 points, cumulative	30% of the final grade for the subject
4	Final exam	According to the session schedule	100 points	40 % of the final score

10.	Assessment		
Rating by letter system	Digital equivalent of points	Percentage Digital equivalent of points Percentage	Description of the assessment (changes should be made only at the level of the decision of the Academic Quality Committee of the faculty)
A	4,0	95-100	Excellent. Exceeds the highest task standards.
A-	3,67	90-94	Excellent. Meets the highest standards of the assignment.
B+	3,33	85-89	Good. Very good. Meets the high standards of the assignment.
B	3,0	80-84	Good. Meets most of the job standards.
B-	2,67	75-79	Good. More than enough. Shows some reasonable ownership of the material.
C+	2,33	70-74	Good. Acceptable. Meets the basic standards of the task.
C	2,0	65-69	Satisfactory. Acceptable. Meets some basic job standards.
C-	1,67	60-64	Satisfactory. Acceptable. Meets some basic job standards.
D+	1,33	55-59	Satisfactory. Minimally acceptable.
D	1,0	50-54	Satisfactory. Minimally acceptable. The lowest level of knowledge and completion of the task.
FX	0,5	25-49	Unsatisfactory. Minimally acceptable.
F	0	0-24	Unsatisfactory. Very low productivity.
11.	Educational resources (use the full link and specify where you can access the texts/materials)		
Literature			Basic
			1. Shipunov A. Introduction to Botany. 2018. – 181p. 2. Raven P., Evert R.F., Eichhorn S.E. Biology of Plants. By W. H. Freeman and Company 2013. – 864 p. 3. Milena Martinková, Martin Čermák, Roman Gebauer, Zuzana Špinlerová. Plant Botany. An introduction to plant anatomy, morphology and physiology. Brno, 2014. 103 p. eBook 4. Torsykbaeva B.B. Anatomy and morphology of the highest plant : textbook / B. B. Torsykbaeva. - Almaty: Almanah, 2022. - 223 p. - ISBN 978-601-7590-88-8
			Additional

	1. Raven P., Evert R.F. , Eichhorn S.E. Biology of Plants. By W. H. Freeman and Company 2013. – 864 p. 2. Milena Martinková, Martin Čermák, Roman Gebauer, Zuzana Špinlerová. Plant Botany. An introduction to plant anatomy, morphology and physiology. Brno, 2014. 103 p. eBook 3. Michael G. Simpson Plant Systematics (Third Edition). - 2018. – 774 p. ebook 4. Gurcharan Singh. Plant Systematics. An Integrated Approach. Science Publishers. - 2011. – 716 p. 5. Arun K. Pandey, Shruti Kasana. Plant Systematics. CRC Press. – 2021. – 340 p. 6. C.O. Moro, G. Basile Obesity and medicinal plants // Fitoterapia. – 2000. - Vol 71, No 1. – P.73-82. 7. Marelli M. Medicinal Plants // - Plants (Basel). 2021 2;10(7):1355. doi: 10.3390/plants10071355 8. Basic: Red Book of Kazakhstan. Vol. 2, part 1: Plants. - Almaty: ArtPrintXXI, 2014. -605 p.
Electronic resources (including, but not limited to: electronic library catalog, databases of scientific literature, databases, animation, modeling, professional blogs, websites, other electronic reference materials (for example, video, audio, digests))	1. http://elibrary.kaznu.kz/ru/ 2. https://study.com/academy/topic/introduction-to-plant-anatomy.html 3. https://botanydepot.com/2021/01/20/videos-plant-systematics-lectures-by-bruce-kirchoff/
Laboratory physical resources	-
Special software	-
12.	Teacher's expectations from students
The student - attends all classes and lectures - actively participates in classroom classes during formative assessment, in group work, - performs tasks on time - shows respect for teachers, university staff and students - carefully handles university property (models, desks, chairs, etc.) - observes cleanliness and order on campus and classrooms - uses gadgets in classes only with the teacher's permission - for all issues within the discipline is addressed to the teacher of this discipline, for general academic issues – to his advisor - correspondence is carried out only through a messenger approved by the teacher, at the time regulated by the teacher	
13.	Discipline Policy
	The discipline policy is determined by the Academic Policy and the Policy of Academic Integrity of Al-Farabi Kazakh National University . If the links will not open, then you can find the relevant documents in the Univer IC. The student is obliged to: - attend classes in a white coat - wear gloves when working with models The student must follow the Code of Professional Conduct of Higher School of Medicine The behavior of the student at the exams is regulated by the "Rules for the final control", "Instructions for the final control of the autumn / spring semester of the current academic year" (current documents are uploaded to the IS "Univer" and updated before the start of the session); "Regulations on checking text documents of students for the presence of borrowings".
14.	Principles of inclusive learning
	1. Constantly preparing for classes: For example, supports statements with appropriate links, makes short summaries

	Demonstrates effective learning skills, helps in teaching others 2. Take responsibility for your training: For example, manages your training plan, actively tries to improve, critically evaluates information resources 3. Actively participate in the group's training: For example, actively participates in the discussion, willingly takes assignments 4. Demonstrate effective group skills For example, he takes the initiative, shows respect and correctness towards others, helps to resolve misunderstandings and conflicts 5. Skillful communication skills with peers: For example, he listens actively, is receptive to nonverbal and emotional signals Respectful attitude 6. Highly developed professional skills: Strives to complete tasks, looking for opportunities for more training, confident and qualified Compliance with ethics and deontology in relation to patients and medical staff Insubordination. 7. High introspection: For example, he recognizes the limitations of his knowledge or abilities, without becoming defensive or reproaching others 8. Highly developed critical thinking: For example, accordingly demonstrates skills in performing key tasks, such as generating hypotheses, applying knowledge to cases from practice, critically evaluating information, making conclusions aloud, explaining the process of reflection 9. Fully complies with the rules of academic behavior with understanding, offers improvements in order to increase efficiency. Observes the ethics of communication – both oral and written (in chats and appeals) 10. Fully complies with the rules with full understanding of them, encourages other members of the group to adhere to the rules Strictly adheres to the principles of medical ethics and PRIMUM NON NOCER	
15.	Distance/Online learning	
	Distance/online learning is implemented at the University in accordance with the Order of the Minister of Education and Science of the Republic of Kazakhstan dated March 20, 2015 No. 137 "On approval of requirements for educational organizations to provide distance learning and rules for organizing the educational process for distance learning and in the form of online learning for educational programs of higher and (or) postgraduate education"; according to the Rules of the organization of training with the use of DOT at the University; Instructions for the final control of the autumn/spring semester of the current academic year (the current document is in the IS "Univer"); "Regulations on checking text documents of students for the presence of borrowings".	
16.	Approval and review	
	Head of the Department of Biodiversity and Bioresources	Nurmakhanova A.S.
	Chair of the Academic Committee on the Quality of Teaching and Learning	Bakhtbayeva L.K.
	Lector of the Department of Biodiversity and Bioresources	Zaparina Ye.