Discipline designation	Fundamentals of Scientific Research Activities
Semester(s) in which the discipline is taught	8
Teacher in charge	Ortiqova Lola Soatovna, Doctor of Philosophy (PhD) in Biological Sciences, Associate Professor
Teaching language	Uzbek
Connection to the curriculum	Mandatory
Academic рўгкк (including contact hours, SsIW)	Total hours: 180 hours Contact hours – Lecture 40 hours Practical - 50 hours SsIW - 90 hours
ECTS	6
Prerequisites	Pedagogy, History, Philosophy
Discipline aims. Learning outcomes	**Goals and objectives** The goal of teaching science is that a master's student studying in the Master's Degree in Methods of Teaching Exact and Natural Sciences (Biology) should have knowledge of the diversity of living organisms, the stages of development of the organic world, the origin and phylogeny of living organisms, and anthropogenesis. **Learning outcomes:** - identify the essence of science and the problems of periodization of the history of science; distinguish between scientific worldviews, goals and objectives of scientific research, their essence – form skills in the rational use of fertilizers in plant cultivation - monitor the growth and development of plants around them - work with educational and scientific texts of varying degrees of complexity that meet the tasks of agricultural activity - use complex and microfertilizers in agriculture - interpret the results of scientific research to explain the observed processes; - be able to scientifically substantiate the feasibility and practicality of feeding
Lesson contents	1. Plant nutrition from the air and roots.. 2. Organic and mineral part of the soil and its properties. 3. Nitrogen, phosphorus, potassium and microelements in plants 4. Use of complex and microfertilizers in agriculture. 5. New types of fertilizers used in agriculture. 6. Physiologically balanced solution. 7. Chemical composition of plants. 8. The amount of water and dry matter in plants. 9. Autotrophic, mycotrophic and bacteriotrophic types of plant nutrition. 10. The role of microorganisms in plant nutrition. 11. Nutrient solutions. Antagonism of ions 12. Root and air nutrition of plants. 13. Nutrition of plant roots. 14. Soil absorption capacity, buffering capacity and reaction of the soil environment are important factors in plant nutrition. 15. The role of nitrogen in plant life. The specificity of plant nutrition with nitrogen.
Examination type	Tests (master's degree): 50 tests are loaded into the computer database,

	duration – 50 minutes.
Training and examination requirements	Requirements for successful mastery of the discipline Complete mastery of theoretical and methodological concepts in the subject, the ability to correctly reflect the results of knowledge, independently reason about the processes being studied and carry out tasks in daily, mid-term, and pass the final control in test form. When creating FA test questions, deviations from the content of the scientific program are not allowed. The FA test bank for each subject is discussed at the meeting and approved by the head of the department. When compiling FA tests, a bank of FA test tasks is used, the number of tests in control is in a 50/50 ratio, depending on classroom and independent learning. No later than 1 week before the start of the meeting, tests signed by the head of the department are submitted to the dean's office and entered into the computer in advance of the exam.
Reference	1. Atabaeva H., Kadirkhozhaev O. Plant breeding. – Tashkent, Yangi avlod asri, 2006. 2. Ataboeva H., Umarov.Z. Plant breeding. – Tashkent, 2004. 3. Bo'riev H.Ch., Abdurakhmonov L.A., T.Jonibekova A. Floriculture. - Tashkent, Mehnat, 1999. 4. Bo'riev H.Ch., Zuev V. Practical training in the selection, seed production and seed science of vegetable crops (manual). – Tashkent, Mehnat, 1997. 5. Bo'riev H.Ch., Boymetov K. Selection and variety science of fruit crops (textbook). – Tashkent, 2001. 6. Yormatova D.YO. Practical training in plant breeding. – Tashkent, Ilm Ziyo, 2004. 7. Zuev V., Abdullaev A. Vegetable crops and their cultivation technology (textbook). - Tashkent, Uzbekistan, 1997. 8. Zokirov T.S. Ecology of cotton fields. – Tashkent, Mehnat, 1991. 9. Kiyatkin A.K. Advice to amateur florists. – Tashkent, 1997. 10. Mutalov K.A. Lecture notes on fruit growing. – Tashkent, 2001. 11. Mutalov K.A. Lecture notes on viticulture. – Tashkent, 2001. 12. Nematov E., Ashurov E. Floriculture in the open field. – Samarkand, 1997. 13. Ortikov R.O., Khalilov N.Kh. Horticulture. – Tashkent, Publishing House of the National Society of Uzbekistan, 2007. 14. Posoponov G.S. Rastenievodstvo. – Moscow, Kolos, 1997. 15. Temurov A. Viticulture. – Tashkent, 2001. 16. Kho'zhanazarov O'.E., Norbobaeva T., Toshkhozhaev R., Mutalov K. Laboratory exercises on cotton growing. – Tashkent, 2007. 17. Toshkhozhaev R. Soil science (laboratory exercises). – Tashkent, TDPU, 2008. 18. Toshkhozhaev R. Agrochemistry (laboratory exercises). – Tashkent, TDPU, 2008. Additional literature 19. Boriev Kh.Ch. Handbook for amateur gardeners. – Tashkent, 2006. 20. Methodical instructions for the implementation of a stage project on viticulture technology by students of the specialty of fruit and vegetable growing and viticulture. – Tashkent, 1996. 21. State register of agricultural crops recommended for planting in the territory of the Republic of Uzbekistan. - Tashkent, 2006.

	Internet sites 22. www. catalog. alledu. ru/predmet/bio/botanika/ 23. www. lyceum1.ssu. runnet.ru/dist/botany/botany. html 24. www.botanik.crown.ru/cgi-bin/shop.cgi 25. http://www.ziyonet.uz/ 26. http://www.google.co.uz/ 27. http://www.google.ru/
Scope of assessment criteria and procedure	**CURRENT CONTROL** **Purpose:** Determining and assessing the master's level of knowledge, practical skills, and competencies on course topics. **Instructions:** The master's activity in daily classes is assessed through the master's mastery of course topics, as well as constructively interpreting and analyzing the educational material, developing module-specific skills, acquiring practical skills (in terms of quality and the specified number) and competencies, solving problem situations aimed at applying professional practical skills, working in a team, preparing presentations, etc. **Current control form:** Activity in lessons Preparing educational materials Working with sources within the subject Using educational technologies Working in a team Preparing presentations Working with projects **INTERMEDIATE CONTROL** **Purpose:** Assessing the master's knowledge and practical skills and level of mastery of lecture material after completing the relevant section of the course. **Form and procedure of intermediate control:** Midterm examination is held during the semester during the training sessions after the completion of the relevant module of the curriculum of the subject. Midterm examination is held once in written form within the framework of this subject. Midterm examination questions cover all topics of the subject. **Independent learning:** **Purpose:** Independent learning is aimed at fully covering the content of this course, expanding the theoretical knowledge acquired, and establishing independent learning activities for masters. **Form and procedure of independent education:** ndependent work assignments are completed in the form of an educational project, presentation, case study, problem solving, information search, digest, colloquium, essay, article, abstract, etc. Completed assignments for independent study are placed in the electronic system and checked based on the anti-plagiarism program and evaluated by the subject teacher. In this case, the uniqueness of the completed assignment should not be less than 60%, otherwise the assignment will not be accepted for assessment. The number of independent work assignments, depending on the nature of the subject, should not be less than 3 for one subject (module). Independent work assignments account for 60% of the points allocated for current and intermediate control. Independent learning task 1: Preparation of project work based on independent learning topics

Independent learning task 2: Preparing sample video lessons based on specialized subject topics.

Independent learning task 3: Preparation of open lesson plans in specialized subjects using interactive methods.

Independent learning task 4: Analysis of educational normative documents for specialized subjects and preparation of presentations.

FINAL CONTROL

Purpose: The final examination is held at the end of the semester to determine the level of mastery of the master's theoretical knowledge and practical skills in the relevant subject. The final examination is held at a specified time according to the examination schedule created by the Registrar's Office on the electronic platform.

Requirements: The master must have passed the current control, intermediate control and independent learning assignments by the deadline for the final control type in the relevant subject.

A master who has not passed the current control, intermediate control and independent learning assignments, as well as who has received a score in the range of "0-29.9" for these assignments and control types, is not included in the final control type.

Also, a master who has missed 25 percent or more of the classroom hours allocated to a subject without a reason is excluded from this subject and is not included in the final control type and is considered not to have mastered the relevant credits in this subject.

A master who has not passed or was not included in the final control type and has received a score in the range of "0-29.9" for this type of control is considered to be an academic debtor.

Final control form: The final examination in this subject will be conducted in written form.

If the final examination is conducted in written form, the requirements for assessment must also be reflected.

Criteria for assessing master knowledge

5 stars	100 points		Evaluation criteria
5	90-100	Excel lent	When a master is considered to be able to make independent conclusions and decisions, think creatively, observe independently, apply the knowledge he has gained in practice, understand, know, express, and narrate the essence of the subject (subject), and have an idea about the subject (subject)
4	70-89,9	Good	When the master is considered to be able to observe independently, apply the knowledge he has gained in practice, understand, know, express, and narrate the essence of the subject (subject), and has an idea about the subject (subject)
3	60-69,9	Satisfa ctory	When the master is found to be able to apply the knowledge he has gained in practice, understands, knows, can express, and narrate the essence of the subject (subject), and has an idea about the subject (subject)
2	0-59,9	Unsatis factory	When it is determined that the master has not mastered the science program, does not

				understand the essence of the science (subject), and does not have an idea about the science (subject)		
Course evaluation criteria and procedure	**Control type**		**Total points allocated**	**Control (task) form**	**Distribution of points**	**Qualifying score**
	Current control		30 points	System tasks	20 points (divided by the number of tasks)	18 points
				Master activity (in seminars, practical, laboratory classes)	10 points	
	Intermediate control		20 points	Supervision: Written work	10 points	12 points
				System tasks	10 points (divided by the number of tasks)	
	Final inspection		50 points	Written assignment (5 questions)	50 points (10 points per question)	30 points
	** **Note:** 60% of the points allocated for current and intermediate control are allocated to independent work assignments. Independent work assignments are evaluated as system assignments through the electronic platform.*					