COURSE DESCRIPTION

Course code	Volume in ECTS credits	Institution	Faculty	Department
AGR8023	7	VMU Agricultural Academy	Agronomy Faculty	Biology and Plant Biotechnology

Course title in Lithuanian

Bitininkystė

Course title in English

Beekeeping

Study methods	Volume in ECTS credits
Lectures	3
Consultations	1
Seminars	
Individual work	3

Short course annotation in Lithuanian (up to 500 characters)

Bitininkystės dalyko studijos skirtos Agronomijos mokslo krypties doktorantams. Studijuodami šį dalyką doktorantai susipažins su bitininkavimu Lietuvoje ir ES keliamais reikalavimais. Bičių šeimos biologija, bityno inventoriumi, pagrindiniais bičių ganyklų augalais, bičių priežiūra, ir selekcija. Gebės vertinti bites kaip agrotechninę žemės ūkio šaką. Žinos ir įvertins kompleksinį bitininkavimą, bičių produktų gamybą ir jų pritaikymą.

Short course annotation in English (up to 500 characters)

Studies in beekeeping subjects are aimed at doctoral students in the field of Agronomy. While studying this subject, doctoral students will get acquainted with the requirements of beekeeping in Lithuania and the EU. Bee family biology, apiary inventory, main bee pasture, bee care, and breeding. Will be able to evaluate bees as an agrotechnical branch of agriculture. Will know and appreciate the complex beekeeping, the production of bee products and their application.

Relevance of the course

There is a doctoral program in beekeeping at a single higher education institution. The module includes the mastery of general and specific competences, theoretical and scientific knowledge about beekeeping, the ability to analyse and evaluate research work.

Course aims

To transfer knowledge, payments, skills about beekeeping, to analyse theoretically and practically as a branch of agriculture, agrotechnical tool, biological whole. Expand general and special competences for students. At the following levels of the cognitive sphere: the mastery of theoretical and scientific knowledge of beekeeping, the ability to analyse and evaluate scientific research work.

Content (topics) and methods

1. INTRODUCTION

1.1 Beekeeping in other countries: industrial beekeeping in the US and Canada; Opportunity to bite in cold climates; beekeeping in European countries.

1.2 Bees in Lithuania: History; amateur beekeeping before World War I; beekeeping in interwar Lithuania; the importance of public beekeeping; the direction of today's beekeeping, science, education.

2. BIOLOGY OF BEES AND THEIR FAMILY

2.1 Bee family.

2.2. Bee's external structure

2.3. Bite's internal organs.

2.4. Types of food and its uptake.

2.5. Bee genotype.

2.6. Bee communication, age-based work.

2.7. Bee family members.
2.8. Bee genetics, systematics of domestic bees.
2.9. Bee nest.
3. APIARY AND EQUIPMENT
3.1. History of Beehive.
3.2. Classification of frame hives.
3.3. Beehives classification.
3.4. Beekeeping supplies: for bees, queens, products, protection.
3.5. Artificial honeycombs and their framing.
4. BEE PASTURE
4.1. Influence of weather on bee and blossom nectars.
4.2. Understanding and classification of pastures.
4.3. Available in the spring, summer and fall.
4.4. Evaluation of plant nectars.
4.5. Sticky jellyfish.
4.6. Ways of exploiting and improving bee pastures.
4.7. Available for crop rotation for bees.
4.8. Indicative calculation of pasture.
5. CARE AND BREEDING OF BEES
5.1. About the safe work of the apiary.
5.2. Carriage of bees.
5.3. Bee fly and their significance.
5.4. Spring bee inspection.
5.5. Slots expansion modes: gradual and single.
5.6. Use of magazines (hunts).
5.7. Works in the main honeycomb.
5.8. Means of mood suppression.
5.9. Possible medics: spring, main, autumn.
5.10. Family preparation for the winter: the best time; quantity and quality of food.
5.11. Bee wintering.
5.12. Genetic basics of bee selection: family relationships; sexual inheritance; mating, about diploid transients.
5.13. Selection methods.
5.14. Boning for bees and queens.
5.15. Techniques for breeding queen bees.
5.16. Techniques for marking and changing the nurses
5.17. Works with natural and artificial clusters.
5.18. Different beekeeping methods: Krikščiūnas method, multistorey and duplex beekeeping, beekeeping in various bits, availability of half frames.
5.19. Beekeeping for early ewes.
5.20. About packaging beekeeping possibilities.
6. BEE - AGROTECHNICAL MEASURE
6.1. Methods of pollination of blossoms.
6.2. Types of pollinators (wind, insects, birds).
6.3. The significance of bee families per hectare: garden plants, legumes.
6.4. Determination of bee sufficiency for pollination in red clover.
6.5. Ways to attract bees.
6.6. Bees in greenhouses.
6.7. Bee protection with pesticides.
7. BIRD CRAFT AND DISEASES

7.1. Characteristics of microorganisms.
7.2. Immunity.
7.3. Sanitary rules for bee care.
7.4. Protection of bees and their products.
7.5. Methods of disinfection.
7.6. Major bee pests: filant, bitlesis, varroa mites and others.
7.7. Bee nest pest.
7.8. The main diseases of the brood include rot, blight, fungal diseases and various deaths.
7.9. Adult bee diseases: nozenematosis, acaraphyosis, toxicosis, etc.
7.10. Treatments for bees.
8. COMPLEX BITCHING
8.1. Traditional honey production: family productivity, honey extraction, honey composition, methods of storage and use.
8.2. Wax, its raw material processing techniques, use
8.3. Pollen, its chemical composition, methods of collection and preservation, bread
8.4. Bee milk, its collection, storage and use
8.5. Poison poisoning, extraction and consumption.
8.6. Ways of picking bee pitch and potential for use them.
8.7. The economic importance of collecting bee products

Structure of cumulative score and value of its constituent parts

A ten-point Critical Scale and Cumulative Scoring Scheme are applied. The tasks of independent work of the semester are evaluated by grade, the final assessment is determined during the examinations, the intermediate evaluations are multiplied by the weighted factor and the product is summed up.

Compulsory reference materials

No.	Authors of publication, title, publishing house, year of publication.
1.	Akadmikas Jonas Kriščiūnas / Sudaryt. P. Vasinauskas – V., 1979, 146 p.
2.	Balžekas J. Bitės ir raudonieji dobilai sėklai. – V., 1985, 128 p.
3.	Bitininkystė. – V., 1970, 447 p.
4.	Bitininko žinynas / sudaryt. J.Balžekas – V., 1987, 380 p.
5.	H. Clement, Y. Le Conte. Le Traite Rustica de l'Apiculture. – Rustica. 2003, – 1 – 528 p.
6.	L. Goodman. Form and Function in the Honey Bee. Ibra. 2003, – 1 – 221 p.
7.	Dadant and Sons. Inc. Mites of the Honey Bee. Printed in the U.S.A., by Book Masters, Inc.
8.	Mansfield, Ohio. 2001, 280 p.
9.	Lietuvos bitininkas. – V., nuo 1993 ..
10.	Gerlt – Seifert L. Bienenkrankheiten und Schadlige. – Berlin, 1982, – 159 p.
11.	Hodowla pszczol. – Warszawa, 1978, 528 s.
12.	A. Matheson. New perspectives on Varroa. International Bee Research Association, 1994, - 162 p.

Supplementary reference materials

No.	Authors of publication, title, publishing house, year of publication.
1.	Straigis J. Bitininkystė. – V., 1994, 208 p.
2.	Алпатов В.В. Породы меденосной пчелы. – М., 1948, 184 с.
3.	Батлер К. Дж. Мир медоносной пчелы. – М., 1980, 232 с.
4.	Малаю А. Итенсификация производства меда. – М., 1979, 176 с.
5.	Медоносная флора основа пчеловодства. – Бухарест, 1977, 249 с.
6.	Пчеловодство – малая энциклопедия /Редкол.: Г.Д. Билаш, А.Н. Бурмистров, В.Г. Гребцова и др. – М., 1991, 510 с.
7.	Скиркявичус А. Феромонная комуникация насекомых. – В., 1986, 291 с.

Course programme designed by

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