Hungarian University of Agriculture and Life Sciences (MATE)
Institute of Landscape Architecture, Urban Planning and Garden Art
Department of Floriculture and Dendrology
Villányi street 29-43., 1118 Budapest, Hungary • phone: +36 1 305 7270
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Ref. no.: MATE-BC/1561-2/2024.
Catalogue no: 2-7.
Attachement:2 pcs

Course requirements
Fall Semester, a 2024/25. academic year

Title of course: *Hungarian name:* *German name:*	**Woody Plant Nursery** *Faiskolai termesztés* *Baumschule*					
Code of course:	TETTD043N					
Degree:	BSc in Horticulture					
Type of courses:	Regular and exchange students (daytime)					
Type of subject:	Regular and exchange students (obligatory for the regular students)					
Number of lessons:	2	hours/week lecture	1 (in 4 hours blocks)	hours/week practical class	3	days/semester field trip
Type of accountability	signature + exam (recommended note possible)					
Type of exam:	oral					
Credit points:	4					
Responsible department:	Department of Floriculture and Dendrology					
Responsible lecturer:	Veronika Szabó PhD					
E-mail address of responsible lecturer:	szabo.veronika@uni-mate.hu					
Office hours of responsible lecturer:	Monday, 11-13 h (by appointment) To avoid unnecessary delays and collisions we ask you to confirm your consultation no later than two working days before the office hours via e-mail to responsible lecturer					
Lecturer of classes:	Dr. Veronika Szabó assistant lecturer Dr Károly Hrotkó professor emeritus					

Course admission prerequisite
None

Course aims

Introduction to propagation and raising of trees and shrubs. Stockplant management, virus-free nuclear stock of fruit trees and vinegrape. Seed orchard and seedling production. Technology of rooting of cuttings, layering, stoolbed management. Budding and grafting methods, raising of grafts. Rootstocks. Container growing systems. Tree production. Bush rose and shrub production. Conifer production. Fruit tree and soft fruit planting material. Lifting and storing of hardy nursery stock.

Course curriculum, date of lessons, lecturers

Please note that the order of the below listed programmes may change for unforeseen reason. If it occurs, we will inform the students during the lesson or through Neptun message. **We would like to inform you that you have to sign into current course via e-learning system (https://elearning.uni-mate.hu/) seeing the lectures and practices online!**

Lectures

Date	Time	Topics and lecturers	Location
10.09.2024	12:45-14:30	Introduction: requirements of the subject, literature, methodology. Parts and role of woody nurseries in horticulture. (Veronika Szabó)	K.311.

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24.09.2024	12:45-14:30	Propagation methods of woody nursery stock. Nuclear stock and propagating material management. (Veronika Szabó)	K.311.
01.10.2024	12:45-14:30	Propagation by seed, seedbed management. Seedling training. (Veronika Szabó)	K.311.
08.10.2024	12:45-14:30	**1st test (20 min)** Autovegetative propagation (by cuttings and layering). Micropropagation in nursery practice. (Veronika Szabó)	K.311.
15.10.2024	12:45-14:30	Propagation by grafting, usage in nursery practice. Grafting formation. (Veronika Szabó)	K.311.
22.10.2024	12:45-14:30	Tree raising by budding and grafting. (Veronika Szabó)	K.311.
29.10.2024	12:45-14:30	Special methods of raising grafts. (Veronika Szabó)	K.311.
05.11.2024	12:45-14:30	**Seed test.** Basics of container grown plant production. Root-balled and transplanted plants. (Veronika Szabó)	K.311.
12.11.2024	12:45-14:30	**2nd test (20 min)** Lifting of field grown plants in the nursery, management of lifting. Transport, storage and marketing of nursery products. Regulation of trade of hardy nursery stock in the EU and in Hungary. (Veronika Szabó)	Soroksár
19.11.2024	12:45-14:30	Basics of rootstock usage for woody plants' grafts. (Dr. Prof. Hrotkó Károly)	K.311.
26.11.2024	12:45-14:30	Rootstocks of main plant groups (fruits and ornamentals) (Dr. Prof. Hrotkó Károly)	K.311.
03.12.2024	12:45	**3rd test (20 min)** (Veronika Szabó)	K.311.

Practice (in 4 hours blocks)

Term	Timing	Topics (and guide in brackets)	Location
16.09.2024	8:15-11:30	Budding practice in same time of field practice. (Veronika Szabó)	Nursery, Soroksár
15.10.2024	8:15-11:30	Hard- and softwood cuttings, propagation by seed, seedbed management. (Veronika Szabó)	Nursery, Soroksár
12.11.2024	8:15-11:30	**2nd test (20 min)** Brief presentation of grafting methods. Grafting practice. Hardy nursery stock. (Veronika Szabó)	Nursery, Soroksár

Field practices:

16.09.2024.	at 8:15	Daily practice (Veronika Szabó)	Nursery, Soroksár
19.09.2024	from 7:00	Field practice (first day: Érd-Elvira and Alsótekeres)	Bus tour starts at 7:00 from the Matthias Collegium (Tas vezér street)
04.10.2024	at 9:30	Field practice (second day: Specialmix Ltd., Gödöllő)	meeting point at railway station in Gödöllö.

The methods of evaluation, exam
Students fulfilling the requirements of the semester, if they have not fulfilled the conditions of recommended grade or want to improve, take an oral exam during the exam period. Requirements: students should show skills in knowledge provided in lectures and practices. Oral exam in randomly chosen topics by students. See more about topics in attachment 2.

Participation requirements
Participation in technical tour, practices are compulsory. Missing students have to take remedy practices.

Missed educational events
Missing students have to apply the Study and Exam Rules of MATE.

Checking the progress in the semester, topics, terms and possible remedies

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1. Seed recognition test: **5th November 2024 at 12:45**. Testing knowledge in seed recognition and some data of seeds (see more in attachment 1).
2. Tests (3 times in semester): testing the basic knowledge provided in the lectures and practices (**8th October, 12th November, 4th December 2024 12:45**).

Acknowledgement of semester requirements
- participation in technical tours (2 times)
- participation in daily practice (1 day)
- participation in the lectures and practices (apply the Study and Exam Rules of MATE)
- achieved minimum level in seed recognition test
- achieved minimum level in tests (3times in the semester)

Evaluation of students in oral exams
Students can achieve recommended grade. It will be counted average of in person held seed test and in person held 3 tests if it has at least medium (3) grade. Those students who do not achieve this, have to take an oral exam during the exam period. In the case of online assessments, the recommended grade cannot be given, in which case students who have met the conditions for signing the semester will take an oral or online exam in accordance with the current rector's instructions.

Compulsory readings:
PPT files of lectures (see website of the department)
Stanley, J. and Toogood, A. 1981. The Modern Nurseryman. Faber and Faber, London
Macdonald, B. 1989. Practical Woody Plant Propagation for Nursery Growers. B.T. Batsford Ltd. London

Further readings:
Krüssmann, G. 1996. Die Baumschule. Verlag Paul Parey, Berlin-Hamburg.
Hartmann, H.T., Kester, D.E., Davies, F.T. and Geneve, R.L. 1997. Plant propagation. Prentice-Hall, Inc.

This curriculum and these requirements were accepted on the meeting of Department of Floriculture and Dendrology on 28th August 2024.
The rules will come on force on the day following its acceptation, while the old standards are repealed.

Budapest, 28. August 2024

Assoc. Prof. Dr. Peter Honfi
head of department

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Course of Woody Plant Nursery
- nr. 1. attachment of the requirements -

SEED RECOGNITION – Native species and rootstocks

Species		Tousand-seed weight (g)	Stratification	
			time (day)*	temp.(°C)*
1.	English oak or Pedunculate oak *(Quercus robur)*	4000 – 4500	-	-
2.	Turkey oak *(Quercus cerris)*	5000 – 5500	-	-
3.	Red oak *(Quercus rubra)*	3800 – 4500	-	-
4.	European hornbeam *(Carpinus betulus)*	50	-	-
5.	Norway maple *(Acer platanoides)*	110 -120	-	-
6.	Planetree maple or Sycamore maple *(Acer pseudo-platanus)*	130 – 140	-	-
7.	Hedge maple *(Acer campestre)*	70 – 80	-	-
8.	Common or European ash *(Fraxinus excelsior)*	70 – 85	-	-
9.	Silver linden *(Tilia tomentosa)*	80 – 90	-	-
10.	Bigleaf linden *(Tilia platiphyllos)*	100 – 110	-	-
11.	European white birch *(Betula pendula)*	0,3	-	-
12.	European crabb apple (*Malus sylvestris)*	25 - 29	80 - 100	2 - 5
13.	European wild pear (*Pyrus pyraster)*	25 - 35	70 - 100	2 - 5
14.	Common quince (*Cydonia oblonga)*	25 - 30	70 - 90	2 - 5
15.	Singleseed hawthorn (*Crataegus monogyna)*	90 - 100	150 - 180	2 - 5
16.	English hawthorn (*Crataegus oxyacantha* syn. *C. laevigata)*	60 - 70	-	-
17.	Sorb tree or service tree (*Sorbus domestica)*	29 - 33	80 - 110	2 - 5
18.	Swedish whitebeam *(Sorbus* x *intermedia)*	25	-	-
19.	Mazzard or sweet cherry (*Prunus avium)*	120 - 180	100 - 150	5 - 8
20.	Sour cherry (Prunus c*erasus)*	150 - 200	150 - 180	3 - 7
21.	Mahaleb (*Prunus mahaleb)*	70 - 90	80 - 100	5 - 8
22.	Apricot (*Armeniaca vulgaris* syn. *Prunus armeniaca)*	1000 - 1500	80 - 120	8 - 12
23.	Plum (*Prunus domestica)*	1000 - 1300	120 - 150	8 - 12
24.	Damsons plum (*Prunus insititia)*	450 - 500	150 - 180	8 - 12
25.	Cherry plum or myrobalan plum (*Prunus cerasifera)*	400 - 600	90 - 120	10 - 12
26.	Blackthorn or sloe (*Prunus spinosa)*	300 - 400	150 - 180	5 - 8
27.	Almond (*Amygdalus communis)*	2500 - 5000	50 - 60	8 - 12
28.	Wild peach (*Persica vulgaris)*	2500 - 5000	90 - 120	8 - 12
29.	Almond-peach (*Amygdalopersica x hibrida)*	2500 - 5000	70 - 90	8 - 12
30.	Common walnut (*Juglans regia)*	8000-12000	50 - 60	3 - 5
31.	European filbert (*Corylus avellana)*	1000 - 1100	210 - 240	3 - 5
32.	Turkish filbert or hazel (*Corylus colurna)*	1500 - 1700	210 - 240	3 - 5
33.	Sweet or European chestnut (*Castanea sativa)*	5000 - 8000	60	5 - 8
34.	Corneliancherry dogwood (*Cornus mas)*	150 – 180	250 - 350	3 - 5
35.	Bloodtwig dogwood *(Cornus sanguinea)*	30	-	-
36.	Dog rose *(Rosa canina)*	20	-	-

*** Only those species have stratification time and temperature that propagated as fruit tree rootstocks. Wild species are stratificated in natural conditions where the temperature is uncontrolled.**

You have to learn common and scientific name, too.

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Attachment 2 - Topics of oral exam on Woody plant nursery

Conditions, regulations and producer organizations of hardy nursery stock production in Europe.
Constitution of hardy nursery stock production: context with propagating material, young plants (liners) and planting material (end-products)
Sexual and asexual propagation of woody plants, their importance in nursery propagation
Stockplants orchards (nuclear stock) for vegetative propagation
Maintaining of clonal plant material and virusfree propagation system
Methods of micropropagation and their importance in woody plant propagation
Advantages and disadvantages in woody plant micropropagation
Conditions and methods of raising seedlings in seedbed
Importance of seed orchards, their types in woody plant propagation
Seed production, collecting of fruit and seed, seed preparation
Seed testing of woody plants
Seed dormancy and preparation of seeds to sowing
Technology of raising seedlings in open ground
Importance of softwood cutting, application in nursery
Principles of softwood cutting technology
Selecting and preparing of stockplants and cutting material
Application of hormonal stimulators in rooting of cuttings
Importance of hardwood cutting, its application in nursery
Mound layering (stooling) and its importance in nursery
Trench layering and its importance in nursery
Simple layering, serpentine layering and their importance in nursery
Tip layering, air layering and layering in pot
Stimulation of rooting in different layering methods
Grafting and application in horticulture
Major steps of graft union formation
Methods of pairing and their application in nursery
Side graftings and their application in nursery
Shoot grafting (herbaceous graft of small fruit) and its application in nursery
Wedge graft (saw-kerf graft) and its application in nursery
Grafting machines and their application in nursery
Bark graftings and their application in nursery
Grafting incompatibility and its importance in life of woody plants
Rootstock-scion interactions and their importance in life of woody plants
The aims of rootstock usage in horticulture
Rootstocks for *Malus* genus, important apple rootstocks
Rootstocks for *Pyrus* and *Cydonia* genus, important pear and quince rootstocks
Rootstocks for cherries, important cherry rootstocks
Rootstocks for peach and almond, important peach and almond rootstocks
Rootstocks for apricot and plum, important apricot and plum rootstocks
Rootstocks of *Juglans, Corylus* and *Ribes* genus
Main technology versions of raising graft
Choosing and preparing of field of grafts
Replant disease and prevention in nursery, crop rotation in nursery
Technology of raising grafts by budding
Technology of raising grafts by bench grafting
Technology of raising grafts by topwork grafting
Training top of fruit trees, improve the branching in nursery
Importance and development of pot (container) grown nursery products
Main technology steps of pot (container) grown plants
Preparing of bareroot trees for lifting
Quality management of bareroot trees during lifting, storing and transporting
Storage of nursery products, principles of design of storage facility