

## COURSE DESCRIPTION

Course code	Volume in ECTS credits	Institution	Faculty	Department
MIŠ8016	7	Vytautas Magnus University Agricultural Academy	Faculty of Forest and Environmental Sciences	Forest Management and Wood Science

### Course title in Lithuanian

Miško našumas

### Course title in English

Forest growth and yield

Study methods	Volume in ECTS credits
Lectures	40
Consultations	10
Seminars	
Individual work	65

### Short course annotation in Lithuanian (up to 500 characters)

Kursas skirtas įgyti žinių apie medžių augimą laisvai, jų konkurencinius santykius medyne, medynų formavimąsi, retinimąsi, našumą, jo santykį su aplinkos faktoriais, reguliavimą ūkinių priemonių pagalba, apie medynų našumo modeliavimo metodus, jų taikymą praktikoje, medynų našumo apskaitos metodus.

### Short course annotation in English (up to 500 characters)

This course provides knowledge to the participants regarding forest growth and yield of the stands. It focuses to the different relations existing between trees and their impact to the growth and productivity. For example, there is a difference when trees grow in competitive situation or grow freely. It has direct impact to natural mortality of trees as well as diameter increment. Also the attention is given to the environmental factors that influence forest growth. Further attention is given to the silvicultural treatments and the possibility to regulate productivity of the stands by cuttings. A special part in this course takes the modelling growth of forest stands by using single tree level simulator BWINPro.

### Relevance of the course

The course takes a comparative approach in understanding by various theories and methodology of Forest growth and yield science. The aim of this course is to introduce the main conceptions of forest growth and yield modelling, as well as the main tendencies on the climate and human impact to forest growth. The first year doctoral students acquire competence in defining assessing and discussing various forest growth and yield issues and main regularities of forest growth. This course of the program is evaluated through the examinations, which includes lectures, consultations, student's homework, and final exam.

### Course aims

To learn the main peculiarities on forest growth, competitive relationship in the stand, stand formation, dynamics, experimental planning, collection of research data, systematization, methods of modeling of stand productivity, get familiar with forest inventory methods.

### Content (topics) and methods

1. Introduction. History of forest productivity science development, change of forest productivity and its regulation, development of research methods, importance of forest productivity and its regulation in the conditions of sustainable development.
2. Tree growth in open space and in the stand, competition between trees and formation of the stand: basic concepts, growth space and its variation, management, competition and thinning, patterns of growth and formation of stands, types of productivity formation.
3. Forest growth and yield modeling: evolution of stand productivity modeling methods, relations of main stand indicators, growth and change patterns and their modeling, structure of stands, growth tension, thinning and modeling. Modeling of parameters of interconnection between the

growing and falling parts of stands. Modeling of tree growth and thinning by evaluating the influence of competition between trees.

4. Productivity of Lithuanian and European forests, division of Lithuanian forests according to different areas of forest productivity.

5. Inventory systems of forest resources

**Structure of cumulative score and value of its constituent parts**

Personal task 30%, Exam 70%.

**Compulsory reference materials**

No.	Authors of publication, title, publishing house, year of publication.
1.	Antanaitis V. Miško naudojimas. Vilnius, 1981, 200 p.
2.	Kairiūkštis L., Juodvalkis A. Etaloniniai medynai ir jų formavimas. Vilnius, 1985.
3.	Kuliešis A. medynų našumas ir jo panaudojimas. Vilnius, Lietuvos agroleidykla, 1989, 141 p.
4.	Kuliešis A. Lietuvos medynų prieaugio ir jo panaudojimo normatyvai. Kaunas, Girios aidų leidykla, 1993, 384 p.
5.	Kuliešis A. Lietuvos miškų rajonavimas pagal medynų našumą. Lietuvos mokslas, V t., 1997, p. 54-63.
6.	Kuliešis A., Petrauskas E., 2000. Lietuvos miškų naudojimo XXI amžiuje prognozė. Kaunas, Naujasis lankas, 146 p.
7.	Kuliešis A., Kasperavičius A., Kulbokas G., Kvalkauskienė M., 2009. Lietuvos nacionalinė miškų inventorizacija. Kaunas, Naujasis lankas, 284 p.
8.	Oliver C.D., Larson B.C. Forest stand Dynamics. Jons Wiley and Sons, 1996, 521 p.
9.	Pretzsch H., 2010. Forest Dynamics, Growth and Yield., Springer, 664 p.
10.	Gadow von K, Hui GY, 1999. Modelling Forest development. Kluwer, Dordrecht, 213 p.
11.	Gadow von K, 2005. Forsteinrichtung. Analyse und Entwurf der Waldentwicklung. Univ-Verlag Gottingen, Gottingen, 342 p.
12.	Антанайтис В.В., Загреев В.В. Прирост леса. Москва, Лесная промышленность, 1979, 251 с.
	Антанайтис В.В., Тябера А.П., Шяпятаене Я.А. Законы, закономерности роста и строения древостоев. Каунас, 1986, 157 с.
	Кофман Г.Б. Рост и форма деревьев. Новосибирск, Наука, 1986, 211 с.
	Кузмичев В. Закономерности роста древостоев. Новосибирск, Наука, 1977, 160 с.
	Лиєпа И.Я. Динамика древесных запасов. Рига, Зинатне, 1980, 139 с.
	Полубояринов О. Плотность древесины. Москва, Лесная промышленность, 1976, 160

**Supplementary reference materials**

No.	Authors of publication, title, publishing house, year of publication.
1.	Wenk G., Antanaitis V., Šmelko Š. Waldertragslehre. Deutscher Landwirtschaftsverlag, Berlin GmbH, 1990, 448 s.
2.	Буш К., Иевинь И. Экологические и технологические основы рубок ухода. Рига, 1984, 175 с.
3.	Загреев В.В. Географические закономерности роста и продуктивности древостоев. Москва, Лесная промышленность, 1978, 240 с.
4.	Moksliniai žurnalai – <i>Forest Science, Forestry, Baltic Forestry, Journal of Environmental Management</i>
5.	Кивисте А. Функции роста леса. Тарту, 1986, 172 с.
6.	

**Course programme designed by**

No.	Name, surname	Institution	Degree	E-mail address
1.	Edgaras, Linkevicius	Institute of Forest Management and Wood Science	assoc. prof., dr.	Edgaras.Linkevicius@vdu.lt