

## COURSE DESCRIPTION

Course code	Course group	Volume in ECTS credits	Course valid from	Course valid to	Reg. No.
BIF5001	C	6	2013 05 31	2016 05 31	

Course type (compulsory or optional)	Compulsory
Course level (study cycle)	II level
Semester the course is delivered	I. autumn
Study form (face-to-face or distant)	Face-to-face

### Course title in Lithuanian

**BIOKURAS**

### Course title in English

**BIOFUELS**

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

Dalykas skirtas supažindinti studentus su bioenergijos gavybos politika – aktualijomis, tikslais, iššūkiais. Aptariami biokurui naudojami ir galimi panaudoti išteklių. Susipažinama su gamybos technologiniais procesais (energetinių augalų plantacinis auginimas ir kuro paruošos, komunalinių atliekų panaudojimas ir kita). Analizuojami Lietuvos ir tarptautiniai teisiniai aktai, reguliuojantys bioenergijos gamybą ir panaudojimą. Pristatomi moksliniai tyrimai ir pasiekimai bioenergetikos srityje.

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

The course aims at giving an overview of the actuality, purposes, and challenges of energy making from biological substances. The emphasis is on the amounts of different sources for biofuels. Different processing technologies for plant material, waste etc. are presented. International and local law rules describing use of biofuels are discussed. Newest research results in the field of bioenergy making are presented.

### Prerequisites for entering the course

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### Course aim

Introducing to students possibilities and technological aspects of energy production from resources of biological origin

### Links between study programme outcomes, course outcomes and criteria of learning achievement evaluation

Study programme outcomes	Course outcomes	Criteria of learning achievement evaluation
1. To apply physical models for the description, analysis and assessment of various energy technologies and their impact on the environment	1.1. Analysing demand and perspectives of the energy produced by traditional way	Competency describe the situation of energy producing and motivate importance of bio energy in nearest future
	1.2. Analysing of perspectives and possible production of energy produced from biological resources	
3. To use advanced system analysis,	2.1. Describe utilization of woody plants for bio fuels producing	Competency describe the plants for biofuels producing,

modelling and design tools to design and develop energy technologies and systems	2.2. Describe specific of bio fuels producing from forest resources and dangers related with this process	describe and evaluate biofuels producing influence on forest ecosystems
	2.3. Describe utilization of grassy plants for bio fuels producing	
	2.4. Describe utilization of non-traditional plants for bio fuels producing	
	2.5. Describe the biological resources for producing of bio fuels	Competency describe resources suitable for producing of bio fuels
	2.6. Acquainting with technologies of bio energetic plantations establishment	Competency characterize the main technologies of growing, harvesting and storing of traditional and non-traditional plants, describe the fundamentals of biofuels production
	2.7. Acquainting with technologies of harvesting and processing of bio mass at the plantations	
5. To use physical understanding of processes in energy systems for the critical analysis of the development trends of energy technologies in the near- and distant-future;	3.1. Analyze scientific achievements in the field of bio energy producing	Competency evaluate the new trends in bio energetic and ecological, and economical effectiveness of new resources for bio energy

#### Link between course outcomes and content

Course outcomes	Content (topics)
1. Analysing of demands and producing perspectives of energy produced by traditional pattern	- mining and perspectives of fuels; - using of renew energy resources.
2. Analysing of perspectives and scale of the energy produced from biological resources	- role of bio energetic in total energy balance; - perspectives and challenges of bio energetic; - bio fuels
3. Describe utilization of woody plants for producing of biofuels	- fare wood; - remains of timber harvesting; - remains of timber processing.
4. Describe specific and dangers of biofuels producing from forest resources	- influence on biodiversity; - influence on the soil; - influence on the forest productivity.
5. Describe utilization of grassy plants for biofuels producing	- assortment of grassy plants suitable for producing of bio fuels; - specific of cultivation of grassy plants for producing of bio fuels.
6. Describe utilization of non-traditional plants for bio fuels producing	- assortment of non-traditional plants suitable for producing of bio fuels; - specific of cultivation of non-traditional plants for producing of bio

	fuels.
7. Describe the biological resources for producing of bio fuels	- wood and things from manufactured wood for bio fuels or processing of such wood; - processing of grassy plants; - processing of waste for Refuse Derived Fuel; - producing and use of bio ethanol for engines; -producing and use of bio diesel.
8. Acquainting with technologies of bio energetic plantations establishment	- willow plantations; - poplar plantations; - grassy plants plantations.
9. Acquainting with technologies of harvesting and processing of bio mass at the plantations	- harvesting and processing technologies at the energetic plantations of woody plants; - harvesting and processing technologies at the energetic plantations of grassy plants.
10. Analyze scientific achievements in the field of bioenergy producing	- discovering of new biological resources for producing of bio energy; - bioenergetic and environment.

#### **Study (teaching and learning) methods**

**Teaching methods:** Telling, explanation, disquisition, consulting, demonstration

**Learning methods:** Studying of literature, debating, problems solving, and problematic tasks.

#### **Methods of learning achievement assessment**

Mid – term exam and final exam, presentation of homework, problems solving during seminars.

#### **Distribution of workload for students (contact and independent work hours)**

Lectures	30 h
Seminars	15 h
Individual students work	96 h
Consultations	4 h
Total:	160 h

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

Mid-term exam - 20% of total evaluation, seminar – 15 % of total evaluation, paper – 15 % of total evaluation, exam – 50% of total evaluation

#### **Recommended reference materials**

No.	Publication year	Authors of publication and title	Publishing house	Number of copies in		
				University library	Self-study rooms	Other libraries
<i>Basic materials</i>						
1.	2005	Jasinskas A., Liubarskis V. Energetinių augalų auginimo ir naudojimo kurui technologijos.		1		
2.	2005	<i>Liubarskis V.</i> Biodegalų naudojimas.		1		
3.	2007	Villu Vares, Ūlo Kask, Peeter Muiste, Tõnu Pihu, Sulev Soosaar. Biokuro	Žara			Acces via internet

		naudotojo žinynas.			
<b><i>Supplementary materials</i></b>					
4.	2000	Kurt Blomquist. Ką jūs žinote apie energiją?: mokomoji knyga apie įvairias energijos rūšis ir jos taupymą.	Žuvėdra		
5.	2006	Kytra S. Atsinaujinantys energijos šaltiniai.	Technologija		
6.	2007	Renatas Budrys. Biokuro gamyba (metodinė priemonė)	Lututė		
6.	2011	E. Dzenajavičienė, N. Pedišius, R. Škėma. Darni bioenergetika	Lietuvos energetikos institutas		

**Course programme designed by**

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