

Course description

Course abbreviation:	KEE/BIE	Page:	1 / 3
Course name:	Bioenergetics		
Academic Year:	2018/2019	Printed:	12.07.2025 17:47

Department/Unit /	KEE / BIE			Academic Year	2018/2019
Title	Bioenergetics			Type of completion	Pre-Exam Credit
Accredited/Credits	Yes, 3 Cred.			Type of completion	
Number of hours	Lecture 2 [Hours/Week] Tutorial 1 [Hours/Week]			Course credit prior to	No
Occ/max	Status A	Status B	Status C	Counted into average	NO
Summer semester	0 / -	0 / -	0 / -	Min. (B+C) students	10
Winter semester	0 / -	0 / -	9 / -	Repeated registration	NO
Timetable	Yes			Semester taught	Winter semester
Language of instruction	Czech			Internship duration	0
Optional course	Yes				
Evaluation scale	S\N				
No. of hours of on-premise					
Auto acc. of credit	Yes in the case of a previous evaluation 4 nebo nic.				
Periodicity	every year				
Specification periodicity					
Substituted course	None				
Preclusive courses	N/A				
Prerequisite courses	N/A				
Informally recommended courses	N/A				
Courses depending on this Course	N/A				

Course objectives:

The subject "Bioenergetics" is focused on processes and technologies that enable the production and energetic usage of biomass. It represents direct ways of burning and gasification of biomass for production of heating and electric energy and further on it represents also direct ways of biochemical conversion of biomass (biogas, bio fuels, bio ethanol and so on) to energetic products and their usage. In the subject are also included principles of taking the decision for economical evaluation of the investments effectiveness in bioenergetics area.

Requirements on student

Seminar: Active participation in lessons, processing and presentation of term paper

Content

- 1 Bio-energy, creation, evolution, classification, benefits, recovery (2hours) 1.lecture
- 2 Basic forms and sources of biomass in relation to their origin (10hours) 5.lectures
 - 2.1 Residual biomass from agriculture, forestry and manufacturing processes
 - 2.2 Municipal and recycled biomass
 - 2.3 Intentionally grown biomass
 - 2.4 Biogas and its potential uses
 - 2.5 Biofuels, distribution, production and use
- 3.The potential for biomass production, its possibilities and uses (2 hours) 1 lecture
- 4.Use of biomass for heat and electricity as energy services (6 hours) 3 lectures
 - 4.1 Technology and equipment for the use of biomass for heat
 - 4.2 Technology and equipment for combined heat and power
 - 4.3 Biofuels and logistics fuel cycle
5. Economic and energy aspects of the use of biomass (2hours) 2 lectures
 - 5.1 Economic instruments for development and evaluation of investment
 - 5.2 Pricing of energy from biomass, the market for biomass and biofuels

6 Environmental aspects of biomass (4hours) 2lectures

6.1 Environmental, food and energy security

6.2 Tools for sustainable Energy Smart

Fields of study

Guarantors and lecturers

- **Guarantors:** Mgr. Eduard Ščerba, Ph.D. (100%)
- **Lecturer:** Mgr. Eduard Ščerba, Ph.D. (100%)
- **Tutorial lecturer:** Mgr. Eduard Ščerba, Ph.D. (100%)

Literature

- **Basic:** Beranovský, J, Murtinger, K. *Energie z biomasy*. ERA, Brno, 2006.
- **Recommended:** Havlíčková, K. a kol. *Biomasa jako obnovitelný zdroj energie*. VÚKOZ Průhonice, 2005.

Time requirements

All forms of study

Activities	Time requirements for activity [h]
Practical training (number of hours)	39
Graduate study programme term essay (40-50)	40
Attendance on a field trip (number of real hours - maximum 8h/day)	3
Total:	82

assessment methods

Knowledge - knowledge achieved by taking this course are verified by the following means:

- Skills demonstration during practicum
- Individual presentation at a seminar

prerequisite

Knowledge - students are expected to possess the following knowledge before the course commences to finish it successfully:

- Knowledge of biological and ecological basics to identify sources of biomass.

teaching methods

Knowledge - the following training methods are used to achieve the required knowledge:

- Lecture with visual aids
- Practicum
- Field trip

learning outcomes

Knowledge - knowledge resulting from the course:

- Students are able to apply acquired knowledge and information from theoretical and practical instruction and technical excursions in relation to knowledge:
 - overview of resources and potentials of biomass,
 - options, methods and techniques of their energy use,
 - production, logistics of biomass-based fuels,
 - strategy for food and energy security, including the legislative amendments

Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan	v.	Year	Block	Status	R.year	R.
Electrical Engineering and Informatics	Bachelor	Full-time	Environmental Engineering	1	16		2018	Doporučené výběrové předměty TEK	C		ZS
Electrical Engineering and Informatics	Postgraduate Master	Full-time	Electrical Power Engineering	1	16		2018	Doporučené výběrové předměty pro obor EE	C		ZS
Electrical Engineering and Informatics	Postgraduate Master	Full-time	Electrical Power Engineering	1	16		2018	Doporučené výběrové předměty pro obor EE	C		ZS
Electrical Engineering and Informatics	Postgraduate Master	Full-time	Environmental Engineering	1	16		2018	Doporučené výběr. předměty oboru TE	C		ZS