



RTU Course "Innovative Technologies and Solutions of Energy Supply"

11509 Vides aizsardzības un siltuma sistēmu katedra

General data

Code	EAS509
Course title	Innovative Technologies and Solutions of Energy Supply
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Academic
Field of study	Environmental Engineering and Management
Responsible instructor	Gatis Bažbauers
Academic staff	Jūlija Gušča
Volume of the course: parts and credits points	1 part, 3.0 Credit Points, 4.5 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Not planned
Maximum auditorium capacity	50
Maximum number of students per semester	50
Abstract	"Innovative Technologies and Solutions of Energy Supply" is focused on definition, expertise of innovation principles and criteria, protection of intellectual and commercial properties (patents, trade marks, designs, etc.), selection and transfer of innovative technologies into real facilities acc. to the energy supply system needs.
Goals and objectives of the course in terms of competences and skills	To get knowledge about innovative energy supply technologies at production, supply and users sides. To understand and to define: (1) conformity of innovative energy supply technologies to innovation concepts; (2) environmental impacts of innovative technologies; (3) suitability of innovative energy supply technologies to local and regional energy market; (4) Intellectual properties strategies and application of patents and trade marks.
Structure and tasks of independent studies	Literature review for analysis of innovative energy supply technologies. Calculations and models about implementation of energy technologies in enterprises and definition of the impacts to the environment from the technologies. Development of patent application and patent examination for innovative energy supply systems.
Recommended literature	1.Kolanowski, Bernard F. Guide to Microturbines, The Fairmont Press, Inc., 2004. 2.O'Hayre R., Cha S.W., Colella W. and Prinz F.B. Fuel Cell Fundamentals, Wiley, 2005. 3.Tiwari G.N. Solar Energy: Fundamentals, Design, Modelling and Applications, Narosa Publishing House, New Delhi, 2004. 4.R.Burgelman, C.Christensen, S.Wheelwright. Strategic Management of Technology and Innovation, 2008. 5.R.G. Cooper, S.J. Edgett. Product Innovation and Technology Strategy, 2009. 6.J.J. Mohr, S. Sengupta, S. Slater. Marketing of High-Technology Products and Innovations, 2009. 7.M. A. White, G.D. Bruton. The Management of Technology and Innovation: A Strategic Approach, 2006. 8.B.Gou, W.Ki Na, B.Diong. Fuel Cells: Modeling, Control, and Applications, 2009. 9.M.Noh. Reactive Transport Modeling: Reactive Transport Modeling in Fractures and CO2 sequestration, 2009. 10.S.M. McJohn. Intellectual Property: Examples & Explanations, 2008. M.A.Golli, Driving Innovation: Intellectual Property Strategies for a Dynamic World, 2008.
Course prerequisites	Energy production and supply, environmental pollution.

Course outline

Theme	Hours
Introduction. Raster method for implementation of innovative ideas. Criteria.	4
Innovation: definition, evaluation criteria, supporting mechanisms.	4
Intellectual and commercial property. Patenting procedure for innovative energy ideas.	8
Practical work	16
Laboratory work	16

Learning outcomes and assessment

Learning outcomes	Assessment methods
Ability to evaluate innovation level of energy supply technologies and to select the technologies for different scale of energy sources.	Examination: practical/lab. work, course work, test. Assessment criteria: is able to define criteria for evaluation of innovative energy supply technologies.

Ability to define the environmental impacts of innovative energy technologies.	Examination: practical/lab. work, course work, test. Assessment criteria: is able to evaluate in quantitative and qualitative way the environmental impacts of innovative energy supply technologies.
Ability to understand and use the concepts of intellectual and commercial properties in the area of innovative energy supply systems.	Examination: practical/lab. work, course work, test. Assessment criteria: able to develop an application of patent/trade marks for different levels of technologies.

Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	3.0	4.5	1.0	1.0	1.0	*		