PhD intensive course of

SUSTAINABLE ENERGY AND ENVIRONMENT

Assoc. Prof. Dr. Kęstutis Buinevičius, Department of Thermal and Nuclear Energy

May 2 - 12, 2017

About the course:

Basics of environmental protection in thermal, nuclear and power energetics. For acquiring knowledge on globality of environmental protection and major technological means for lowering of environmental pollution. Principles of pollution prevention and selection of environmental pollution reduction measures by energy production. Formation of main pollutants during combustion process and emission reduction methods. Key environmental problems of nuclear fuel cycle and impact of power plants. Main principles of nuclear facilities impact assessment to the environment in the case of nuclear accidents. Formation of electromagnetic fields and their shielding capabilities, understands and evaluates the particularity of biological influence of electromagnetic fields on the environment. The technologies, to be able to select them and evaluate.

Aim of the course:

To know environmental pollution by energy production problems and methods of it's lowering in thermal, nuclear, power technologies. Understand principles and methods of pollution prevention in energy production.

Target group:

Students who would like to broaden their knowledge in the sphere of environmental protection by energy production, for student having or not having fundaments of energy engineering.

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Course format, ECTS credits:

Full course sustain 30 h of lectures and practical job , 16 h for individual work . Visits to power generation and heating plants using different kind of fuel - biofuel, natural gas . Two individual works - one of them calculation of dispertion of pollutants in the atmosphere or another work from thermal energy generation field , another – from electricity generation field. Final exam (written) from all 4 parts of course. The evaluation is on a pass/fail basis (graduation on the Lithuanian 10-scale may be obtained if necessary).
Study load: 9 ECTS credits.

Main topics of the course:

- Principles of energy sustainability. Harmonious development of energy policy
- Perspective of alternative energy sources application
- Nuclear energy as sustainable energy source and related environmental problems
- Accidents in nuclear power plants
- Principles of safe operation of nuclear installations
- Influence of power energetics on environment
- Environmental problems in the electrical power engineering
- Electromagnetic fields, their shielding and biological effects
- Impact of solar and wind power plants on the environment
- Reduction of environmental pollution in the thermal energetics
- Pollutants generation in the fuel combustion processes
- Dispersion of pollutants in the atmosphere
- Primary abatement methods
- Flue gas cleaning technology

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References:

1. Printed materials of lections
2. Urbonavičius E., Kaliatka A., Ušpuras E. Accident management for NPPs with RBMK reactors / Ed. J. Vilemas // New York: Begell House Inc., 2010. Kaunas: Lithuanian Energy Institute, 2010. 205 p. ISBN 9
3. B.S. Guru, H. R. Hiziroglu. Electromagnetic Field Theory Fundamentals. Cambridge university press, 2005, 681 p. (KTU, Statybos ir archit. fak. b-ka, E30260 .
4. Integrated Pollution Prevention and Control. Best Available Techniques for Large Combustion Plants. European Commission, DG JRC. http://eippcb.jrc.es

Course schedule:

Start date: May 2, 2017 at 9 a.m.
End date: May 12, 2017 at 4 p.m.

Course fee:

9 ECTS course fee is 810 EUR . Travel, insurance, board and living expenses, *are not* included in course fee.
Course is free of charge for students who come to study under the Erasmus+ program.

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