

THE IMPACT OF INDUSTRY ON THE ENVIRONMENT AND MONITORING METHODS (Cvetka Ribarič Lasnik, Ph.D., Assist. Prof.)

Subject code: VIMM

Academic year: 2

Lectures: 40

Seminars: 10

Lab exercises: 10

ECTS: 6

Aims of the subject:

The students will be acquainted with different types of industry and main technological processes that are carried out in individual branches of industry. They will learn about material and energy flows that are currently present in individual branches of industry. They will become familiar with emissions of substances and heat into water, emission of substances and heat into the air, waste issues, emissions of industrial substances in the environment (noise, vibrations, radiation etc.), regulations in the field of emissions from industrial sources into the environment which are typical for individual branches of industry. The students will gain the basics to understand other contents which are related to environmental impacts arising from industry.

Teaching methods:

Lectures, seminars, field work and practical classes.

Student's obligations:

Completed practical activities, seminar paper (production, defence) and written exam

References:

- RIBARIČ-LASNIK, Cvetka., 2010: Industrial Effects on the Environment. Environmental Protection College, Velenje (internal study material - textbook).

Aims of the subject:

The Student will:

- learn about the monitoring, to know what it is and to understand it
- learn about measurement methods and devices to perform chemical monitoring,
- learn about measurement methods to perform physical monitoring,
- the learn about the issues of performing monitoring in the field,
- the learn about the basics of biomonitoring - the use of living organisms to evaluate the condition and effects on the environment,
- to acquire adequate basics to understand other contents which deal with monitoring and where monitoring results play an important part of the study,

- to meet organisational and other measures to reduce negative industrial impacts on the environment (treatment plants, waste management plans, SIST ISO 9001, ISO 14001, SIST EN, ISO/IEC 17025,

Subject content:

1. Theoretical part:

Introductory part:

- history of implementation of monitoring in terms of regulations,
- history and development of measurement methods which are used during the process of monitoring,

Chemical monitoring:

- basics of chemical analysis of drinking water,
- basics of chemical analysis of waste waters,
- basics of chemical analysis of surface waters
- basics of chemical analysis of other waters (groundwaters, technological waters etc.)
- basic physical measurements of waters (flow, level, temperature, electrical conductivity, turbidity, radioactivity, etc.)
- basic chemical measurements of flue gases,
- air emission monitoring (wet and dry deposit, meteorological parameters),
- measurement of microclimate,
- measurement of odour,
- basic chemical measurements of food,
- basic chemical measurements of waste, and
- continuous measurements of emission sources.

Physical monitoring:

- noise measurement,
- measurement of light,
- measurement of radioactivity,
- measurement of vibrations, temperature and flows, and meteorological measurements.

The issues of monitoring in the municipal and residential areas:

- municipal waste treatment plants
- landfills,
- transport,
- residential areas,
- etc.

Biomonitoring:

- active and passive bioindicators,

- transport and transformation processes of pollutants in organisms,
- biotic and abiotic stress factors,
- basics of oxydative stress at the level of cells,, organs, organisms and populations.

Requirements that must be considered during monitoring:

- acts and other regulations such as decrees, rules, directives, standards,
- legal obligations (monitoring, waste management plan, authorised person),
- new trends.

2. Field work

Work during the monitoring:

- accredited laboratory designed for monitoring,
- implementation of monitoring in the field (air emission, microclimate, bioindication...),
- taking samples in the field (water, waste, gases),
- statistical analysis of data and production of reports.

Teaching methods:

Lectures, seminars, field work and practical classes.

Student's obligations:

completed practical activities, seminar paper (production, defence) and written exam.

References:

- RIBARIČ-LASNIK, Cvetka., 2010: Metode monitoringa. Environmental Protection College, Velenje (internal study material - textbook).
- RIBARIČ-LASNIK, Cvetka, ERŽEN, Ivan, KUGONIČ, Nives, POKORNY, Boštjan, KONČNIK, Damjan, SVETINA, Marta, JUSTIN, Barbara, DRUKS, Polonca, BOLE, Mojca, ROŠER-DREV, Alenka, VETRIH, Matjaž, FLIS, Jelka, KOTNIK, Klemen, MAVSAR, Robert, PAČNIK, Leopolda, SAVINEK, Karin. Comparative study of polluted environment in the Upper Mežica Valley among various states during 1989-2001 - final report. volume 1-6 Velenje: ERICO, November 2002.
- RIBARIČ-LASNIK, Cvetka, PAČNIK , Leopolda, SAVINEK, Karin, POLIČNIK ,Helena, BIENELLI –KAPIČ, Andreja, PLUT, Dušan, BOLE, Mojca, KUGONIČ, Nives, BERIČNIK-VRBOVŠEK, Julija, AL SAYEGH- PETKOVŠEK, Samar, POKORNY, Boštjan, GLASENČNIK, Erika, PAVŠEK, Zoran, KOPUŠAR, Nataša. Environmental pollution and natural resources as development factors in the region of Zasavje - model approach - final report. Velenje. ERICO, 2001.

- MARKERT, B.A., BREURE A.M., ZECHMEISTER, H.G.: Bioindicators and Biomonitoring, 2003. Elsevier Science Ltd.