

| Course code | Course group | Volume in ECTS credits | Course hours |
|-------------|--------------|------------------------|--------------|
| APL3006 | C | 5 | 130 |

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| Course type (compulsory or optional) | Optional |
| Course level (study cycle) | I cycle |
| Semester the course is delivered | Spring |
| Study form (face-to-face or distant) | Face-to-face |

Course title in Lithuanian

APLINKOS INŽINERIJA

Course title in English

ENVIRONMENTAL ENGINEERING

Short course annotation in Lithuanian

Šio kurso tikslas supažindinti su oro teršalų sklaidos dėsniniais, inžineriniais oro taršos mažinimo priemonėmis ir švaresnės gamybos principais, užteršto vandens nuotekų valymo ir geriamo vandens ruošimo technologijomis bei įrengimais, atliekų tvarkymo prioritetais ir metodais, atliekų rūšiavimo svarba mažinant atliekų srautus į sąvartynus, transporto keliamo triukšmo mažinimo priemonėmis, atsinaujinančiais energijos šaltiniais. Praktinių užsiėmimų metu studentai įgys praktinių įgūdžių parenkant poveikio aplinkai mažinimo inžinerines priemones, atitinkančias geriausių esamų technologijų koncepciją ir darnaus vystymosi principus.

Short course annotation in English

The course is aimed at analysis cleaner technologies, pollution of atmosphere, distribution of air pollutants, treatment systems of the industry emissions, solid and hazardous waste collection and disposal systems. After completion of this course students will be able to characterize ecological situation, to assess the environmental pollution and to choose way to reduce environmental impact with help of technical – engineering means.

Prerequisites for entering the course

General Ecology, Environment and Development APL2001, Environment Bioindication

Course aim

To introduce the engineering of air, water pollution abatement and cleaner production principles, sewage and drinking water treatment technologies, renewable energy sources.

Links between course outcomes and criteria of learning achievement evaluation

| Course outcomes | Criteria of learning achievement evaluation |
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| To introduce the engineering of air, water pollution abatement and cleaner production principles, sewage and drinking water treatment technologies, renewable energy sources. | Be able to characterize air pollution sources, to describe the techniques used to reduce environmental pollution and decontamination Be able to provide technical means for waste collection, storage and disposal. Be able to describe wastewater pollutants predict their disposal methods. Be able to describe the water treatment technologies |
| Provide practical skills in selecting environmental impact of engineering measures in line with the best available technology concept and the principle of sustainable development | Be able to calculate the water consumption rates, characterizing the resources used to generate energy from renewable and local sources. Be able to provide technical measures to reduce traffic noise |

Content (topics)

1. Air pollution, pollutant dispersion and counting.
2. Clean fuels and the promotion of advanced after-treatment technologies. Clean Technology.
3. Technologies of purification, decontamination of industrial emissions into air.
4. Non-hazardous and hazardous wastes and their disposal, landfill.

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| 5. Various waste processing technologies. Water pollution. |
| 6. Sewage types and methods of waste treatment. Sewage classification. |
| 7. Mechanical, chemical and biological treatment plants, and basics of their planning |
| 8. Water treatment equipment, water supplies, water quality, water consumption rates. |
| 9. Heat and electricity production and distribution. |
| 10. Vehicles and systems, pollution and noise reduction. |

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

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| Lectures – 45 hours, laboratory work – 11,25 hours, seminars – 11.25 hours, individual work – 62,5 hours. Total 130 h. |
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Structure of cumulative score and value of its constituent parts

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| Final assessment sums the assessments of written final examination (50%), written mid-term examination (25%) and assessment of laboratory works (25%). |
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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. | 1996 | Baltrėnas P., Lygis D., Mierauskas P., Ožkinis V., Šimaitis R. Aplinkos apsauga: vadovėlis aukštųjų mokyklų studentams | Vilnius: Enciklopedija | 40 | | |
| 2. | 2003 | Burinskienė M., Adomavičius V., Juškevičius P., Klibavičius A., Narbutas B., Rimkus A., Šliogeris J. Miestotvarka: vadovėlis aukštųjų mokyklų studentams | VGTU leidykla: Technika | 15 | | |
| 3. | 2003 | Tumas R. Vandens ekologija: vadovėlis aukštųjų mokyklų studentams | LŽŪU | 30 | | |
| 4. | 2002 | Subalansuotosios plėtros įgyvendinimo nacionalinė ataskaita (ats. red. R. Juknys). | Lututė | 1 | 10 | |
| <i>Supplementary materials</i> | | | | | | |
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Course programme designed by

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| Dr. Bronius Kriščiūnas, Faculty of Natural Sciences, Department of Environmental Sciences |
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