

**Energy-ecological assessment of the constructions of bioenergy facilities**

Instructors:

Genadii GOLUB

Viacheslav CHUBA



**Course Handbook**

TREATY – Nurturing deep tech talents for clean and sustainable energy transition

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## Course Information

Title: Energy-ecological assessment of the constructions of bioenergy facilities

Instructors: Gennadii GOLUB, Viacheslav CHUBA

ECTS: 3

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| --- | --- |
| Course structure: | 90 hours |
| Lecture classes | 15 hours |
| Laboratory classes | 15 hours |
| Personal Activities | 60 hours |

Mode of delivery: *[ hybrid]*

### Course Summary

### *The aim of the educational discipline is to provide the environment for the mold and development of students, which will allow them to master the basic knowledge, skills, and abilities necessary for further professional and professional-scientific activities.*

### *The main task of the educational discipline is to determine ways to increase the degree of zero-waste production and reduce the burden on the environment, to study the theoretical foundations and technologies of using secondary resources and non-traditional energy sources, to study the design features of innovative resource- and energy-saving aggregates and technologies, to provide in-depth knowledge of the principles of life cycle assessment of object of design or production, study of typical techniques for modeling various processes and phenomena, study of methods of energy and environmental assessment of design solutions and objects of design, determine the impact of resource consumption during manufacture and objects.*

### Learning Outcomes

Upon completion of the course, students will be able to know about:

*1. The concept of sustainable development and environmentally friendly production.*

*2. Solving the energy-ecological problems arising in the design, manufacture and use of modern bioenergy machinery and equipment.*

*3. To know the basic definitions in the field of waste management and the principles of waste classification.*

*4. Manage solid industrial waste.*

*5. General characteristics of industrial solid waste.*

*6. Use of models in systems analysis for the design of bioenergy machinery and equipment.*

*7. Modelling the energy performance of bioenergy machinery and equipment.*

*8. Forming the ecological passport of machines and equipment for bioenergy.*

*9. Design the life cycle of parts and units of bioenergy equipment.*

*10. Analyze the life cycle of the bioenergy machine (equipment).*

In order for each participant to complete successfully the course and be awarded the corresponding ECTS credits, they must pass the course assessment. The outcome of the assessment can be either Pass or Fail.

**Assessment methods**

* Exam

|  |  |
| --- | --- |
| **Learning outcomes** | **Assessment examples** |
| * The concept of sustainable development and environmentally friendly production. | Oral presentation, quiz, laboratory research |
| * Solving the energy-ecological problems arising in the design, manufacture and use of modern bioenergy machinery and equipment. | Oral presentation, quiz, laboratory research |
| * To know the basic definitions in the field of waste management and the principles of waste classification. | Oral presentation, quiz, laboratory research |
| * Manage solid industrial waste. | Oral presentation, quiz, laboratory research |
| * General characteristics of industrial solid waste. | Oral presentation, quiz, laboratory research |
| * Use of models in systems analysis for the design of bioenergy machinery and equipment. | Oral presentation, quiz, laboratory research |
| * Modelling the energy performance of bioenergy machinery and equipment. | Oral presentation, quiz, laboratory research |
| * Forming the ecological passport of machines and equipment for bioenergy. | Oral presentation, quiz, laboratory research |
| * Design the life cycle of parts and units of bioenergy equipment. | Oral presentation, quiz, laboratory research |
| * Analyze the life cycle of the bioenergy machine (equipment). | Oral presentation, quiz, laboratory research |

### Bibliography

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2. Виробництво та використання дизельного біопалива. Механіко-технологічні основи: монографія / Голуб Г. А., Павленко М. Ю., Чуба В. В.; за ред. Г. А. Голуба. – К.: НУБіП України, 2017. – 340 с. ISBN 978-617-7396-47-4.
3. Відновлювана енергетика в аграрному виробництві / Скидан О.В., Голуб Г.А., Кухарець С.М., Ярош Я.Д., Чуба В.В., Цивенкова Н.М., Марус О.А., Павленко М.Ю.; за ред. О.В. Скидана і Г.А. Голуба. – Житомир-Київ: Поліський університет-НУБіП України, 2022. – 422 с.
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6. Машини та обладнання для біоенергетики: навч. посіб. / Голуб Г. А., Цивенкова Н. М., Марус О. А., Павленко М. Ю., Яременко О. А.; за ред. Г. А. Голуба. – К.: НУБіП України, 2022. – 203 с.
7. Determining of the influence of reactor parameters on the uniformity of mixing substrate components / Golub G., Trehub M., Holubenko A., Tsyvenkova N., Chuba V., Tereshchuk M. Eastern-European Journal of Enterprise Technologies. 2020. [Vol. 6, No. 7 (108)](http://journals.uran.ua/eejet/issue/view/13062). P. 60–70. https://doi.org/10.15587/1729-4061.2020.217159.
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11. Renewable energy in agriculture / G.A. Golub, O.V. Skydan, S.M. Kukharets, N.M. Tsyvenkova, O.A. Marus, Y.D. Yarosh, V.V. Chuba, M.Yu Pavlenko; edited by G.A. Golub and O.V. Skydan. – Kyiv-Zhytomir: NULES of Ukraine-Polissia University, 2023. – 400 p.

### Course Timetable

## The 1-st group

|  |  |  |  |
| --- | --- | --- | --- |
| **Lecture** | **Date and Time** | **Instructor** | **Venue** |
| 1st, 2nd | 22.04.2024,  16:50 – 18:10 | Prof. Gennadii GOLUB | <https://zoom.us/j/92794927668?pwd=ZnFzbW1wQUt1K3JZejliRkpmWTNsZz09> |
| 3rd, 4th | 23.04.2024,  9:00 – 10:30 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 5th | 24.04.2024,  9:00 – 10:30 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 6th | 25.04.2024,  9:00 – 10:30 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 7th | 26.04.2024,  9:00 – 10:30 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 8th | 29.04.2024  9:00 – 10:30 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 9th | 30.04.2024,  9:00 – 10:30 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 10th | 01.05.2024  9:00 – 10:30 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| **Summarizing. Presentation of certificates to graduates.** | 05.06.2024  8:30 – 11:30 | Prof. Gennadii GOLUB  Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |

## The 2-nd group

|  |  |  |  |
| --- | --- | --- | --- |
| **Lecture** | **Date and Time** | **Instructor** | **Venue** |
| 1st, 2nd | 22.04.2024,  18:30 – 19:50 | Prof. Gennadii GOLUB | <https://zoom.us/j/92794927668?pwd=ZnFzbW1wQUt1K3JZejliRkpmWTNsZz09> |
| 3rd, 4th | 23.04.2024,  10:45 – 12:15 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 5th | 24.04.2024,  10:45 – 12:15 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 6th | 25.04.2024,  10:45 – 12:15 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 7th | 26.04.2024,  10:45 – 12:15 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 8th | 29.04.2024  10:45 – 12:15 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 9th | 30.04.2024,  10:45 – 12:15 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
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| **Summarizing. Presentation of certificates to graduates.** | 05.06.2024  8:30 – 11:30 | Prof. Gennadii GOLUB  Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |

## The 1-st group

|  |  |  |  |
| --- | --- | --- | --- |
| **Seminars, practice and laboratory works** | **Date and Time** | **Instructor** | **Venue** |
| 1st | 23.04.2024,  12:30 – 14:00 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 2nd | 24.04.2024,  12:30 – 14:00 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 3rd | 25.04.2024,  12:30 – 14:00 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 4th | 26.04.2024,  12:30 – 14:00 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 5th | 29.04.2024  12:30 – 14:00 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 6th | 30.04.2024,  12:30 – 14:00 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 7th | 01.05.2024  12:30 – 14:00 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
| 8th | 02.05.2024  12:30 – 14:00 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |

## The 2-nd group

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| --- | --- | --- | --- |
| **Seminars, practice and laboratory works** | **Date and Time** | **Instructor** | **Venue** |
| 1st | 23.04.2024,  14:15 – 15:45 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |
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| 8th | 02.05.2024  14:15 – 15:45 | Assoc. Prof. Viacheslav CHUBA | BILA TSERKVA NATIONAL AGRARIAN UNIVERSITY,  building 2,  classroom 137 |

### Contact Details of Instructor(s)

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