



СИЛАБУС ДИСЦИПЛІНИ
«Building material science and welding in construction»

Ступінь вищої освіти - Bachelor
 Спеціальність 192-«Building and civil engineering»
 Освітня програма - «Bachelor»
 Рік навчання – 1, 2. Semester – 2, 3.
 Форма навчання - daily learning
 Кількість кредитів ЄКТС - 5
 Мова викладання – english

Лектор курсу
 Контактна інформація
 лектора (e-mail)
 Сторінка курсу в eLearn

Aftandiliants I.

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Part 1. <http://elearn.nubip.edu.ua/course/view.php?id=1168>

Part 2. <http://elearn.nubip.edu.ua/course/view.php?id=2257>

ОПИС ДИСЦИПЛІНИ

(до 1000 друкованих знаків)

Purpose is skills of building material science and welding in construction and laying the basis for the study subjects: "Machine parts", "Hoisting machinery", "Tractors and cars", "Agricultural and meliorative machines", "The safety and repair of machines."

Objectives:

- Study methods of obtaining metals and alloys;
- Study of the structure, properties and destination of metals and alloys;
- Studying the basic theory of heat treatment of carbon and alloy steels, their technology heat and chemical-heat treatment, as well as specific details and working of agricultural machines;
- The study of the structure, properties and appointment of non-metallic construction materials.

THE STRUCTURE OF DISCIPLINE

| Title of thematic modules and themes | Hours (Lectures / Laboratory lessons/ Independent study) | Training facts | Tasks | Estimation, units |
|--|---|---|--|-------------------|
| 2 semester | | | | |
| The thematic module 1. Metal science | | | | 25 |
| Theme 1. Classification, structure and composition of building materials | 4/10/5 | Student should be <i>know</i> : the main connections between the composition, structure and properties of steels and cast irons and changes in these properties under thermal, chemical or mechanical stress. Student should <i>be able to</i> based on knowledge of the | Delivery of laboratory works. Execution of independent works. Performing laboratory and independent work in "Elearn" | 10 |
| Theme 2. Carbon steels and cast irons | 4/4/5 | | | 15 |

| | | | | |
|---|-----------------|--|--|------------|
| | | working conditions to work of the machine parts to select of the steels and cast irons for their production. | | |
| The thematic module 2. Heat treatment of building materials | | | | 25 |
| Theme 3. The theory of heat treatment | 1/2/5 | Student should be <i>know</i> : | | 10 |
| Theme 4. Technology of heat treatment | 1/2/5 | the main connections between the composition, structure and properties of steels and cast irons and changes in these properties under thermal, chemical or mechanical stress. Student should <i>be able to</i> based on knowledge of the working conditions to work of the machine parts to select of the steels and cast irons for their production. | Delivery of laboratory works. Execution of independent works. Performing laboratory and independent work in "Elearn" | 13 |
| The thematic module 3. Alloy and non-ferrous alloys, inorganic and organic binders, aggregates, concretes, ceramic and polymeric materials | | | | 20 |
| Theme 5. The alloying theory | 4/6/5 | Student should be <i>know</i> : | | 7 |
| Theme 6. Non-ferrous metals and alloys | 2/2/3 | the main connections between the composition, structure and properties of alloy steels and changes in these properties under thermal, chemical or mechanical stress. | Delivery of laboratory works. Execution of independent works. | 7 |
| Theme 7. Inorganic and organic binders, aggregates, concretes, ceramic and polymeric materials | 14/4/2 | Student should <i>be able to</i> based on knowledge of the working conditions to work of the machine parts to select of the steels and cast irons for their production. | Performing laboratory and independent work in "Elearn" | 6 |
| Total for 2 semester | 30/30/30 | - | - | 70 |
| Test | | | | 30 |
| Total for 2 semester | | | | 100 |
| 3 semester | | | | |
| The thematic module 4. Welding technology in construction | | | | 35 |
| Theme 8. Formation of welded joints and weldability of metal. Classification of welding | 2/2/4 | Student should be <i>know</i> : the main connections between the | Delivery of laboratory works. Execution of | 5 |

| | | | | |
|--|-----------------|--|--|------------|
| methods in construction | | composition, structure and properties of corrosion and heat resistant steels and magnetic alloys and changes in these properties under thermal, chemical or mechanical stress. | independent works. Performing laboratory and independent work in "Elearn" | |
| Theme 9. Arc welding: manual arc welding with a fusible electrode, automatic arc welding with a fusible electrode, arc welding in shielding gases, arc welding with a non-fusible electrode, special types of arc welding. | 2/2/4 | Student should <i>be able to</i> based on knowledge of the working conditions to work of the machine parts to select of the corrosion and heat resistant steels and magnetic alloys for their production. | | 10 |
| Theme 10. Plasma welding. Electroslag welding. Gas welding. | 2/2/4 | | | 10 |
| Theme 11. Hot welding tools. Cold welding tools. Radiation welding. Inspection of welded joints | 2/2/4 | | | 10 |
| The thematic module 5. Welding in construction | | | | 35 |
| Theme 12. Classification of welded structures. Features of welding of different types of metals. Basic types of welded joints. Operation of welded joints under different load conditions. | 2/2/4 | Student should be <i>know</i> : the main connections between the composition, structure and properties of copper, aluminum, titanium, magnesium and their alloys and changes in these properties under thermal, chemical or mechanical stress. | Delivery of laboratory works. Execution of independent works. Performing laboratory and independent work in "Elearn" | 5 |
| Theme 13. Construction welded metal structures: frames of industrial buildings, welded beams, trusses and columns, sheet solid building structures | 2/2/3 | Student should <i>be able to</i> based on knowledge of the working conditions to work of the machine parts to select of the copper, aluminum, titanium, magnesium and their alloys for their production. | | 10 |
| Theme 14. Machine-building welded structures and pipelines | 2/2/4 | | | 10 |
| Theme 15. New technologies in construction. | 1/1/3 | | | 10 |
| Total for 3 semester | 15/15/30 | - | - | 70 |
| Exam | | | | 30 |
| Total for course | | | | 100 |

EVALUATION POLICY

| | |
|---|---|
| <i>Deadline and retake policy:</i> | The student must submit the work within the time specified by the teacher. Works that are submitted in violation of deadlines without good reason are evaluated at a lower grade. Rearrangement of modules takes place with the permission of the lecturer if there are good reasons (for example, hospital). |
| <i>Academic Integrity</i> | Write-offs during tests and exams are prohibited (including the use of mobile devices). Course papers, abstracts must have correct text references to the literature |

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|--------------------------------|--|
| <i>Policy:</i> | used |
| <i>Visiting policy:</i> | The student is obliged to attend classes of all kinds every day in accordance with the established schedule, not to be late, to have the appropriate appearance. For objective reasons (for example, illness, international internship) training can take place individually (in online form in consultation with the dean of the faculty) |

STUDENT EVALUATION SCALE

| Student rating, points | Evaluation results on national exam tests | |
|-------------------------------|--|--------------|
| | Exams | Tests |
| 90-100 | Excellent | Accepted |
| 74-89 | Good | |
| 60-73 | Satisfactory | |
| 0-59 | Unsatisfactorily | Not accepted |