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| **STUDY PROGRAMME:** | **Professional Undergraduate Study Programme *Agriculture*** Specific field of study: Plant production, Zootechnics, Management in Agriculture |
| **Course:** | **HOUSING FACILITIES** **IN ZOOTECHNICS** |
| **Course code:** 38864**Course status**: elective | **Semester: IV.** | **ECTS credits: 4** |
| **Course holder:**  | **Miomir Stojnović,** M. Sc., senior lecturer |
| **Course associates:**  | **Marija Jakuš Hrestak**, M.Eng.Agr.,assistant |
| **Modes of delivery:** | **Number of hours**  |
| **Lectures** | 30 |
| **Excersises** | 20 |
| **Seminars** | 10 |

**Course objectives:** To enable students to acquire competences for the proper selection of materials for the construction of buildings in animal husbandry, calculation of heat losses of the building, critical assessment of the requirements of individual species and categories of livestock for microclimate and hygiene in the barn, valorization of the advantages and disadvantages of different construction methods in accordance with legal regulations in the field of construction

**Course content**

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|  |  | **Modes of delivery:** | **Places of delivery** |
|  | **Course units**  | **L** | **E** | **S** |
|  | ***Introduction.*** Significance and specifics of construction in animal husbandry. Urbanistic-technical construction conditions. Legal regulation. Construction and process documentation. Construction investment program. Components of the main design. | 6 | - | 2 | Classroom |
|  | ***Construction materials.*** Natural and artificial materials, physical and mechanical properties of materials, technological processability of materials. | 5 | 4 | - | Classroom,Practicum |
|  | ***Concrete.*** Types of concrete, heavy concrete, reinforced concrete, prestressed concrete, lightweight concrete. Classes of concrete, preparation, properties. | 3 | - | - | Classroom |
|  | ***Brick.*** Types of brick products, solid, hollow, porous brick, properties.***Wood and wooden constructions.*** Properties of wood, advantages and disadvantages, timber, laminated glued wood, OSB boards ***Metal structures in prefabricated construction.*** | 2 | - | - | Classroom,Practicum |
|  | ***Insulation materials in construction***. Internal and external insulation. Heat balance of the building, heat losses. Ventilation and transmission losses, calculations. Thermal conductivity and heat transfer coefficient. Heat transfer rate through peripheral constructions. The outer envelope of the building, energy saving options, classic, low-energy and passive construction. | 5 | 4 | 2 | Classroom,Practicum |
|  | ***Buildings in animal husbandry.*** Classical and prefabricated construction of stables and supporting buildings. Silos, collection pits and lagoons for slurry, manure pits for solid manure. | 3 | 4 | 2 | Classroom,Practicum |
|  | ***Microclimate in buildings.*** Ensuring optimal of temperature-moisture conditions in the barn, thermal and hydro isolation. Production of heat, water vapor and CO2 per livestock unit. Calculation of barn ventilation. Requirements of individual species and categories of livestock for the microclimate in the barn. | 3 | 4 | 2 | Classroom,Practicum |
|  | ***Calculation of barn heating and cooling.*** Energetic efficiency in construction. Energy saving options. | 3 | 4 | 2 | Classroom |
| **In total** | **30** | **20** | **10** |  |

**L=Lectures, E=Excersises, S=Seminars**

**Learning outcomes (LO)**

LO 1. Choose materials for construction in animal husbandry.

LO 2. Calculate heat losses of buildings in animal husbandry.

LO 3. Critically assess the requirements of individual species and categories of livestock for microclimate and hygiene in the barn.

LO 4. Calculate the ventilation capacity of the barn in accordance with the climatic conditions and livestock requirements.

LO 5. Present the rules and requirements for low-energy construction and energy savings.

LO 6. Valorize construction designs for the needs of presentation and interpretation of construction and technical-technological features of the farm.

Course holder:

Miomir Stojnović, M. Sc., senior lecturer

Križevci, July 2024