Discipline	QUALITY ASSESMENT AND GRAIN STORAGE code: 48a winter semester	
Specialty	AGRONOMY	
ECTS credits: **6**	Form of assessment: Continuous assessment	
Lecturer	Prof. Dragomir Plamenov, PhD Room: NUK 429 Phone: +359 52 383 670 E-mail: dplamenov@tu-varna.bg	
Department	PLANT PRODUCTION	
Faculty	*FACULTY OF MECHANICAL ENGINEERING AND TECHNOLOGIES*	

Learning objectives:

Annotation:
The curriculum is intended for students who receive Bachelor's degree. The grading and storage of grain discipline enables the students to learn about the significance of the production of the main arable crops as a raw material and energy source in human life. On the other hand, attention is focused on the grading and the ways of storing the produced produce in order to maximally preserve the different quality characteristics of the produced grain / seed. Successful preservation requires good knowledge of the processes and changes that take place during storage, as well as the conditions that affect storage. The subject gives basic knowledge in the field of grain processing - technologies for processing of wheat, rye, triticale and maize for obtaining of different types of flour and grain products (oat and barley kernel products). Problems of grading and storing the produced produce are closely related to the features in modern technologies for the production of the respective crop (variety / hybrid), the genetic features, the influence of the external factors of the environment. All this leads to the expansion and consolidation of acquired knowledge in biochemistry, soil science and agrochemistry, genetics and seed production. The discipline allows students to get acquainted with the grain raw materials as a commodity and object of storage and processing, with the physical properties of the grain; physical processes occurring in the grain during storage; grain and grain pests and pest control, and the basic grain storage regimes, with the latest legal provisions on grading and storing production, as well as the functions and organization of the Grain Committee.
Main issues of the syllabus content:

- Grain grading;
- Storage of grain.

CONTENTS:

Training Area	Hours lectures	Hours seminar exercises

Chemical composition of the grain - grouping of the grain by chemical composition; main chemical constituents of the grain (water, nitrogen substances, enzymes, carbohydrates, fats).	3	
Grain mass - concept; components; physical properties – pourability, self-sorting, density and porosity, sorption properties; thermophysical properties.	3	
Biology of grain mass. Biological processes – respiration and aging; post-harvest ripening; grain germination.	3	
Self-heating of the grain mass - microflora of the grain mass; reasons for self-heating of the grain; phases of self-heating; influence of self-heating on grain quality.	4	
Regimes for storing the grain - in a dry state; in a cooled state; with active ventilation; under anaerobic conditions; by chemical and physical means.	4	
Storage of grain from cereal crops (GRL) - regime; conditions; peculiarities in storing the grain of the individual types of LFA.	3	
Storage of grain from cereal and leguminous crops (LGB) - regime; conditions; peculiarities in storing the grain of the individual types of ZBK.	3	
Storage of oilseeds (OM) - regime; conditions; peculiarities when storing the grain of individual types of MK.	3	
Types of grain storage facilities. Flat grain storage - types; requirements.	1	
Grain silos - classification; schematic diagram of the main technological processes in a grain silo; types of silos - a silo on a flat reinforced concrete foundation; foot silo with conical bottom; stainless steel silo; silage with plastisol.	3	
Organization of the seed control service in Bulgaria: sampling; basic principles in seed control; sampling devices and methods; grain moisture; contamination of the grain by diseases and enemies.		2
Seed control documents and rules for their issuance: procedure for issuing a certificate; import of cereal seeds; documents for trade in the country; export documents.		2
Determination of basic quality indicators of grain mass - hectoliter weight; fracture (vitreousness) of the grain; determination of wheat quality by percentage of colored grains.		2
Determining the intensity of respiration of cereals by the amount of separated carbon dioxide.		2
Basics of grain storage: physical properties of the grain mass; physical processes taking place in the grain during storage; pests of grain and grain products and methods of combating them; main modes of storage of grain raw materials.		3

Technological operations during reception and processing of the grain mass: drying of the grain mass - methods, control and management; Granaries - classification, device, furniture; Ventilation - nature and meaning, organization, control; Expedition - organization, devices, features, methods and means of storage of grain raw materials.		4
TOTAL: **30 h**	**15**	**15**