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| Course: | *Drying and Storage of Agricultural Products* |
| Course id: 3OРT7И12 |
| Number of ECTS: 6 |
| Teacher: | Dr. Ivan Pavkov, Professor Assistant |
| Course status | Elective |
| Number of active teaching classes (weekly) |
| Lectures: 2 | Practical classes: 2 | Other teaching types: - | Study research work: - | Other classes: - |
| Precondition courses | None/navesti ako ima |
| 1. Educational goal

Introduction students with the basics technical and technological solutions for drying, processing and storaging: grain, seed, vegetables and other biomaterials. Drying is operation found in almost all industrial sector, ranging from agriculture to pharmaceuticals. It is the oldest, most diverse and most energy intensive operation. Drying technology is lied down on transport phenomena of energy in materials. This process in not only the removal of liquid from grains, but also with the extent to which the dried product meets the necessary quality criteria. This criterion is upon the knowledge of process and technical equipment which are on disposal. |
| 1. Educational outcomes

On successful completion of this subject, the students should: a) to assemble mastery of the knowledge, techniques, skills and tools related to grain storing and handling equipments for grains, seed, vegetables and other biomaterilas. b) be able to identify, analyze and solve drying and storing facilities problems, c) the knowledge gather in this subject will provoke creativity in design and management of grain handling system. |
| 1. Course content

Lectures:1. Overview on the history of food drying, 2. Physical properties of grains and bulk (dimension, shape, volume, surface area, bulk and true density, angle of repose, moisture content, porosity, thermal properties like specific heat, coefficient of mass diffusion, coefficient of heat transfer ), 3. Convective grains drying, 4. Moist air diagram – psychometrics (conventional drying, two air passing with or without supplementary heating, isothermal drying,), 5. Technical design of industrial dryers for grains, seeds, vegetables and ather biomaterials. 6. Farm crops storing (physical, chemical and biological properties of bulk grain, microorganisms, insects, bird , mice and rodent attack, self heating of stored grains, handling equipments, the construction and properties of storage systems, anti fire and anti explosion measures)Practice:Measuring of agricultural materials physical properties. Drying kinetics of thick grain layer. Calculation exercises: Change of state humid air, classical drying, stepwise drying, drying with recirculation. Material bilans of grain during drying process. Calculations of thermal and material bilans for air during drying processes.  |
| 1. Teaching methods

Lectures – oral presentations with power point softer, Practical classes- calculations and practical work in laboratory, Consultations and Term paper |
| Knowledge evaluation (maximum 100 points) |
| Pre-examination obligations | Mandatory | Points | Final exam (izabrati) | Mandatory | Points |
| Lecture attendance | Yes | 5 | Oral part of the exam | Yes | 10 |
| Tests | Yes | 70 |  |
| Exercise attendance | Yes | 5 |
| Term paper | Yes | 10 |
| Literature  |
| Ord. | Author | Title | Publisher | Year |
|  | Arun, M. Mujundar | Handbook of Industrial Drying, Third edition | Taylor and fracis Froup, CRC Press Book | 2012 |
|  | Babić, Lj. | Drying and Storage (in Serbian) | Faculty of Agriculture, Novi Sad | 2012 |
|  | Sauer, D.B. | Storage of Cereal Grains and Their Products | American Association of Cereal Chemists, Inc. St. Paul, Minnesota, USA | 1992 |

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| Znak univerziteta | UNIVERSITY OF NOVI SADFACULTY OF AGRICULTURE 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 8 | Znak fakulteta2 |
| Study Programme AccreditationUNDERGRADUATE ACADEMIC STUDIES CROP SCIENCE |
| Table 5.2 Course specification |