DISCIPLINE DESCRIPTION

1. Information on the study programme

1.1 Academic institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**FACULTY OF ENVIRONMENTAL PROTECTION**
1.3 Department	**Food Engineering**
1.4 Field of study	**Food Engineering**
1.5 Cycle of study	**BACHELOR**
1.6 Study programme/Qualification	**Processing Technology of Agricultural Products / Engineer**

2. Information on the discipline

2.1 Name of discipline		**Biophysics I**					
2.2 Course holder		Lecturer Phys. Eng. Alin Cristian TEUȘDEA, PhD					
2.3 Seminar/Laboratory/Project holder		Lecturer Phys. Eng. Alin Cristian TEUȘDEA, PhD					
2.4 Year of study	**1**	2.5 Semester	**1**	2.6 Type of evaluation	**Ex**	2.7 Regime of discipline	**C**

(C) Compulsory; (O) Optional; (E) Elective

3. Total estimate time (hours per semester of didactic activities)

3.1 Number of hours per week	**2**	out of which: 3.2 course	**2**	out of which 3.3 seminar/laboratory/project	0/ **2**/0
3.4 Total hours in the curriculum	**56**	out of which: 3.5 course	**28**	out of which 3.6 seminar/laboratory/project	0/**28**/0

Time allotment	hours
Study assisted by manual, course support, bibliography and notes	20
Additional documentation in the library/ on specialised electronic platforms and in the field	14
Preparation of seminars/laboratories/ topics/reports, portfolios and essays	29
Tutorship	0
Examinations	6
Other activities.....	0

3.7 Total hours of individual study	**69**
3.9 Total hours per semester	**125**
3.10 Number of credits	**5**

4. Prerequisites (where appropriate)

4.1 curriculum	-
4.2 competences	-

5. Conditions (where appropriate)

5.1. related to course	• The course is based on oral presentation with video projector, notebook with MS PowerPoint software, Adobe Reader, Internet access. Students can ask questions and have the obligation to follow the course schedule. • During the course students will not be present with open mobile phones.
5.2. related to seminar/laboratory/ project	• For practical work, it is mandatory to prepare (study) each practical work a week before.

	• Each student will conduct an individual activity with the equipment and laboratory materials that will be completed by performing the calculations described in the laboratory guide. • During laboratory work, students are not allowed to make telephone calls within the laboratory.

6. Specific competences acquired	
Professional competences	• Identify and appropriately use the main laws and physical principles in a given context: Apply physics principles and laws in solving theoretical or practical problems under qualified assistance. • To develop the ability to explain phenomena in food engineering as a consequence of applying physics laws in the context of the complexity of food systems • To develop the ability to use lab techniques necessary for food engineering designing experimental design, obtaining experimental data, analyzing and interpreting them and formulating conclusions • To apply the knowledge in the physics field of both in concrete situations in related fields and in experiments, using standard laboratory equipment.
Transversal competences	• To demonstrate preoccupation for professional development through the use of practical thinking skills, engineering • To participate in scientific projects • Acquiring / completing the information needed to assimilate the content of disciplines in food engineering

7. Objectives of discipline (coming from the specific competences acquired)

7.1 General objective	▪ Acquiring specific the language and the notions related to physical phenomena that arise in the field of food engineering.
7.2 Specific objectives	▪ Acquiring specific language ▪ Acquiring insights regarding the physical phenomena that arise in the field of food engineering ▪ Interpretation of physics equations and their correct application in experiments ▪ Performing experimental measurements, processing and interpreting the results ▪ Identifying applications specific to the field of food engineering in which the physical phenomena were studied

8. Content*/

8.1 Course	Methods of teaching	No. of hours/Remarks
Physical sizes and their measurement.	systematic exposure, conversation, problem-solving,	**2**

Error evaluation, results processing and evaluation.	systematic exposure, conversation, problem-solving,	**2**
Mechanics - general problems. Vector computation.	systematic exposure, conversation, problem-solving,	**2**
Kinematics. Speed and acceleration. The circular motion. The relative movement of the material point.	systematic exposure, conversation, problem-solving,	**2**
Dynamics and static of the material point. The principles of dynamics. Movement of the material point under the action of forces. The kinetic moment theorem. The Law of Kinetic Moment Conservation. Mechanical work and power. Kinetic energy. Potential energy. Total energy. The Law of Total Energy Conservation..	systematic exposure, conversation, problem-solving,	**2**
Oscillations and waves. Dynamics of harmonic oscillatory motion. Composition of harmonic oscillations. Mechanical waves.	systematic exposure, conversation, problem-solving,	**2**
Hygrothermal elements The heat. Temperature. Thermal flow. Thermal Flow Density. Heat exchanges through convection and radiation. Practical relationships of evaluation. Heat exchanges through conduction.	systematic exposure, conversation, problem-solving,	**2**
Fourier law for heat conduction. Unique conditions for the Fourier conductive heat transfer equation. Static conductive heat transfer through structures without internal heat sources. Thermal transfer through a structure with infinite planar parallel surfaces. Unique contact conditions in planar-parallel multilayer structures.	systematic exposure, conversation, problem-solving,	**2**
Thermodiffusion of water vapor in stationary hygrothermal regime through a homogeneous planar-parallel multilayer structure.	systematic exposure, conversation, problem-solving,	**2**
Simplifying hypotheses for the mathematical modeling of the water vapor diffusion phenomenon. The practical mathematical model.	systematic exposure, conversation, problem-solving,	**2**
Elements of atmospheric physics Overview of the Earth's Atmosphere. Composition of atmospheric air. The importance of the main components of the air. Atmospheric impurities.	systematic exposure, conversation, problem-solving,	**2**
The vertical structure of the atmosphere. Atmospheric parameters. Air temperature. Air humidity.	systematic exposure, conversation, problem-solving,	**2**
Geometric Optics Introduction. The Laws of Reflection and Refraction. The principle of Fermat. Optical prisms.	systematic exposure, conversation, problem-solving,	**2**
Ideal Optical Systems - General Rules. Cardinal points and planes. Composition of centered optical systems.	systematic exposure, conversation, problem-solving,	**2**
Obs: * Oral exposures, videoprojector presentations, simulations		
Bibliography 1. Creangă Ileana, Fizică (I), Ed. Matrix Rom, București, 2005.		

2. Creangă Ileana, Fizică (II), Ed. Matrix Rom, București, 2014.
3. Boer A., Optică, Ed. Matrix Rom, București, 2006.
4. Demşoreanu B., Mecanică teoretică, Tipografia Universităţii Timişoara, 1991.
5. Irina Nicoară, Introducere în optică, Tipografia Universităţii Timişoara, 1990.
6. I. Luminosu, Fizică, Tipografia Universităţii Tehnice "Politehnica" Timişoara, 1991.
7. Alin C. Teuşdea, Fizică generală prin aplicaţii practice, Ed. Universităţii din Oradea, ediţia a 2-a, 2012, ISBN 978-606-10-0778-3; 53(075.8).
8. Alin C. Teuşdea, Elemente de biofizică în tehnică, Curs, 2012.
9. Lungu, C., 2002, Principii generale de conservare a produselor alimentare, Universitatea „Dunărea de Jos" IDD, Galaţi.

8.2 Seminar	Methods of teaching	No. of hours/ Remarks
8.3 Laboratory		
NTSM and the rules of operation of the laboratory of Biophysics processing	systematic exposure	**2** /experiment
Processing of experimental data. Errors calculation	systematic exposure, conversation, problem-solving,	**2** /experiment
Errors propagation	systematic exposure, conversation, problem-solving,	**2** /experiment
The least squares method	systematic exposure, conversation, problem-solving,	**2** /experiment
Weighing methods with balance. Determination of the density of liquids by the pycnometer method.	systematic exposure, conversation, problem-solving,	**2** /experiment
Determination of surface tension coefficient with stalagmometer.	systematic exposure, conversation, problem-solving,	**2** /experiment
Measuring viscosity of liquids with Ostwald viscometer.	systematic exposure, conversation, problem-solving,	**2** /experiment
Determination of specific heat to solids by calorimetric method.	systematic exposure, conversation, problem-solving,	**2** /experiment
Determination of the concentration of a solution with the density calibration curve	systematic exposure, conversation, problem-solving,	**2** /experiment
Determination of the concentration of a solution with the calibration curve of the dynamic viscosity	systematic exposure, conversation, problem-solving,	**2** /experiment
Composition of perpendicular harmonic oscillations (Lissajous 2D and 3D figures)	systematic exposure, conversation, problem-solving,	**2** / simulation
Heat transfer through a multilayer structure (3 layers) plan - parallel.	systematic exposure, conversation, problem-solving,	**2** / simulation
Heat transfer through a planar - parallel multilayer structure (5 layers), with vapor barrier.	systematic exposure, conversation, problem-solving,	**2** / simulation
8.4 Project	-	-

Bibliography
1. Creangă Ileana, Fizică (I), Ed. Matrix Rom, București, 2005.
2. Creangă Ileana, Fizică (II), Ed. Matrix Rom, București, 2014.
3. Boer A., Optică, Ed. Matrix Rom, București, 2006.
4. Demşoreanu B., Mecanică teoretică, Tipografia Universităţii Timişoara, 1991.
5. Irina Nicoară, Introducere în optică, Tipografia Universităţii Timişoara, 1990.
6. I. Luminosu, Fizică, Tipografia Universităţii Tehnice "Politehnica" Timişoara, 1991.

7. Alin C. Teuşdea, Fizică generală prin aplicaţii practice, Ed. Universităţii din Oradea, ediţia a 2-a, 2012, ISBN 978-606-10-0778-3; 53(075.8).
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Lungu, C., 2002, Principii generale de conservare a produselor alimentare, Universitatea „Dunărea de Jos" IDD, Galaţi.

* The content, respectively the number of hours allocated to each course / seminar / laboratory / project will be detailed during the 14 weeks of each semester of the academic year.

9. Corroboration of discipline content with the expectations of the epistemic community, professional associations and representative employers from the field corresponding to the study programme

10. Evaluation

Type of activity	**10.1 Evaluation criteria**	**10.2 Evaluation methods**	**10.3 Share in the final grade**
10.4 **Course**	**Written exam**	Written paper	**50%**
10.5 Seminar	**-**	-	-
10.6 **Laboratory**	**Practical colloquium**	Executing a practical work/experimet	**50%**
10.7 Project	-	-	-
10.8 Minimum standard of performance: Each of the two components of the final mark must be passed with a minimum grade of 5 (five).			

Date of completion	Signature of **course** holder**	Signature of ~~seminar~~ **laboratory**/~~project holder~~ **
.....	Alin Cristian Teuşdea, PhD, ateusdea@uoradea.ro	Alin C. Teuşdea, PhD ateusdea@uoradea.ro

Date of approval in the department

.....

Signature of the Head of Department

Lecturer Eng. Adrian V. Timar, PhD

Dean signature

Prof. Eng. Ioan Chereji, PhD