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 II**						
2.2 Course holder	Lecturer Phys. Eng. Alin Cristian TEUŞDEA, PhD						
2.3 Seminar/Laboratory/Project holder	Lecturer Phys. Eng. Alin Cristian TEUŞDEA, PhD						
2.4 Year of study	**1**	2.5 Semester	**2**	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**
Geometric Optics. Light dispersion. Types of optical prisms with applications in optical systems and spectroscopy**.**	systematic exposure, conversation, problem-solving,	**2**
Applications in refractometry (Abbe refractometer) in order to determine the concentrations of some solutions.	systematic exposure, conversation, problem-solving,	**2**
Spherical diopters, flat diopters.	systematic exposure, conversation, problem-solving,	**2**

Slim lenses.	systematic exposure, conversation, problem-solving,	**2**
The thick lens.	systematic exposure, conversation, problem-solving,	**2**
Centric optical systems. Design of centric optical systems (C.O.S.) from two thin lenses	systematic exposure, conversation, problem-solving,	**2**
Design of centric optical systems (C.O.S.) of two spherical diopters, thick lens	systematic exposure, conversation, problem-solving,	**2**
Optical instruments. Human eye, magnifying glass, microscope, telescope. Objectives and eyepieces of optical instruments. Applications in biophysics.	systematic exposure, conversation, problem-solving,	**2**
Media of optics with variable refractive index	systematic exposure, conversation, problem-solving,	**2**
Electromagnetic Optics. General notions of electromagnetism - Maxwell's equations. Electromagnetic waves.	systematic exposure, conversation, problem-solving,	**2**
The study light polarization. Applications of polarizer with penumbra in biophysics.	systematic exposure, conversation, problem-solving,	**2**
Interference of light. The condition of interference. Interference of light by dividing the wave front. Interference devices by dividing the wave front.	systematic exposure, conversation, problem-solving,	**2**
Biophysics applications in food preservation Physical Principles of Atmospheric Conservation: High Pressures; with magnetic field; microwave and high frequency streams.	systematic exposure, conversation, problem-solving,	**2**
Physical principles of conservation by thermal methods: with ionizing radiation; with ultraviolet radiation; by ohmic heating.	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
Perpendicular oscillations composition - Lissajous 2D and 3D figures.	systematic exposure, conversation, problem-solving,	**2** /experiment
Specific heat of the dough determination by the calorimetric method	systematic exposure, conversation, problem-solving,	**2** /experiment
Specific heat of bananas determination by the calorimetric method	systematic exposure, conversation, problem-solving,	**2** /experiment
Relative air humidity determination by means of hygrometer.	systematic exposure, conversation, problem-solving,	**2** /experiment
Wheatstone Bridge. Measure specific resistance.	systematic exposure, conversation, problem-solving,	**2** /experiment
Determining the focal length of a convergent lens by the direct method.	systematic exposure, conversation, problem-solving,	**2** /experiment
Study of light intensity distribution with photoelectric cell I.	systematic exposure, conversation, problem-solving,	**2** /experiment
Elements of refractometry. Determination of refractive index of liquids and Brix index with Abbe refractometer	systematic exposure, conversation, problem-solving,	**2** /experiment
The concentration of a solution determination with the calibration curve of the refractive index.	systematic exposure, conversation, problem-solving,	**2** /experiment
Elements of polarimetry. The concentration of aqueous solutions of optically active substances determination with polarimeter with penumbra.	systematic exposure, conversation, problem-solving,	**2** /experiment
The concentration of an aqueous solution of optically active substance determination with the calibration curve.	systematic exposure, conversation, problem-solving,	**2** /experiment
Design of Compact Centric Optical Systems: 1. The thick lens;	systematic exposure, conversation, problem-solving,	**2** / simulation
Design of Compact Centric Optical Systems: 2. Two thin lens system (microscope).	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.
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* 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 Cristian 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