Annex 6

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	**ENVIRONMENTAL ENGINEERING**
1.4 Field of study	**ENVIRONMENTAL ENGINEERING**
1.5 Cycle of study	
1.6 Study programme/Qualification	**BIOTECHNICAL AND ECOLOGICAL SYSTEMS ENGINEERING**

2. Information on the discipline

2.1 Name of discipline			**PROBABILITY THEORY AND MATEMATICAL STATISTICS**				
2.2 Course holder			s.l. dr. Monica COSTEA				
2.3 Seminar/Laboratory/Project holder			s.l. dr. Monica COSTEA				
2.4 Year of study	I	2.5 Semester	2	2.6 Type of evaluation	E	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	4	out of which: 3.2 course	2	out of which 3.3 seminar/laboratory/project	2
3.4 Total hours in the curriculum	56	out of which: 3.5 course	28	out of which 3.6 seminar/laboratory/project	28
Time allotment					hours
Study assisted by manual, course support, bibliography and notes					28
Additional documentation in the library/ on specialised electronic platforms and in the field					10
Preparation of seminars/laboratories/ topics/reports, portfolios and essays					2
Tutorship					2
Examinations					2
Other activities.....					
3.7 Total hours of individual study	**44**				
3.9 Total hours per semester	**100**				
3.10 Number of credits	4				

4. Prerequisites (where appropriate)

4.1 curriculum	

4.2 competences	

5. Conditions (where appropriate)

5.1. related to course	Classroom with appropriate infrastructure, PC, projector, internet access
5.2. related to seminar/laboratory/ project	Facility adequate laboratory infrastructure, PC, Software for statistical processing of data

6. Specific competences acquired	
Professional competences	- C1. Explain the mechanisms, processes and effects of natural or anthropogenic origin and influences that cause environmental pollution - Analysis of the quality and quantity of natural phenomena and processes to prevent and minimize environmental impact, - Aplication Basic scientific knowledge in defining and explaining the specific concepts and environmental engineering, - Definition Fundamental concepts needed to apply scientific theories and methodology of the environment. - Identify solutions professional scientific and technological project implementation, - Use Basic scientific knowledge in defining and explaining the specific concepts and environmental engineering
	- C4. Using legal norms and best available technologies (BAT) to prevent and mitigate impacts of natural and anthropogenic environmental - Adapting professional standards and methodologies projects BAT / BREF - Identify the legal rules and regulations in accordance with best practices specific to mitigate the negative environmental impact - Hierarchy information for compiling and completing the databases of Biotechnical and Ecological Systems - Selecting and adapting methodologies to specific environmental factors (water, air, soil) and their typology for sustainable development. - - Efficient use of rules (standards, legislation, etc.) working in defining variants and variant identification of optimal
Transversal competences	- - C2 Management and resolution of specific environmental issues for sustainable development: - Aplicarea Technical and technological knowledge in defining and explaining basic concepts specific to engineering and environmental protection, - Description And applying concepts, theories and practical methods / technology / engineering for the determination of environmental quality, - Valuate the quality and quantity of natural phenomena and human activities on the quality of environmental factors, - Explicarea And interpretation of concepts, methods and models of basic environmental engineering problems, - Identify the best technical and technological solutions for implementing professional projects for engineering and environmental protection

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

7.1 General objective	The student should understand and be able to work with physical concepts underlying the phenomena of pollution, protection technologies and associated physical phenomena.
7.2 Specific objectives	Presentation of phenomena, laws, principles, relations and specific rules, as well as new trends and guidelines in the field,

	emphasizing the role of information and on the formative physics, the fundamental discipline process and technical education, understanding the discipline, in close correlation with the implications it has on the development of science, technology and engineering technology.

8. Content*/

8.1 Course	Methods of teaching	No. of hours/Remarks
Course.1 Chapter I. Elements of descriptive statistics for univariate distributions. I.1. Statistics in environmental and biological research. I.2. The experimental. Sampling and statistical inference.	Lecture, debate, problem solving, Experiment frontal, guided discovery	2
Course 2. I.3. Data types and scales of measurement. I.4. Classification tables. I.5. Graphical representations of univariate distributions. I.6. Measurement of central tendency	Lecture, debate, problem solving, Experiment frontal, guided discovery	2
Course 3. I.7. The measurement of dispersion and variability. I.8. Indices of form: symmetry and yard.	Lecture, debate, problem solving, Experiment frontal, guided discovery	2
Course 4. I.9. Accuracy, precision and choosing the number of significant digits	Lecture, debate, problem solving, Experiment frontal, guided discovery	2
Course 5. I. 10. Representations semi-graphical distributions: box-and -whisher and stem and leaf.	Lecture, debate, problem solving, Experiment frontal, guided discovery	2
Course 6. Cap. II. Elements of Mathematical Statistics II. 1. Elements of combinatorial calculation. II. 2. Definitions of probability	Lecture, debate, problem solving, Experiment frontal, guided discovery	2
Course 7. II. 3. Discrete distributions: binomial distribution, Poisson.	Lecture, debate, problem solving, Experiment frontal, guided discovery	2
Course 8. II. 3. Discrete Distributions: hypergeometric, negative	Lecture, debate, problem solving,	2

binomial.	Experiment frontal, guided discovery	
Course 9. II. 4. Distributions continue: normal distribution asymptotically normal distribution, inequality of Cebâşev and normal distribution.	Lecture, debate, problem solving, Experiment frontal, guided discovery	2
Course 10. II. 5. Approximations and correction for continuity.	Lecture, debate, problem solving, Experiment frontal, guided discovery	2
Course 11. II. 6. Samples derived from normal distributions: the distribution of hi square, Student's t distribution, the distribution F Fisher.		2
Course 12. Cap. III. Elements of inferential statistics III. 1. The central limit theorem. III. 2. Interval estimation of the mean value. III. 3. Test statistic. III. 4. Null hypothesis. The level of significance. III. 5. t test of a population mean.	Lecture, debate, problem solving, Experiment frontal, guided discovery	2
Course 13 III. 6. Comparisons between the two samples. III. 7. F-test for comparison of the variances of two different samples. III. 8. Comparison of proportions: hi square method, techniques Comparison between observed and theoretical proportions.	Lecture, debate, problem solving, Experiment frontal, guided discovery	2
Course 14 III. 9. Criteria for selecting statistical tests. III.10. Elements of correlation analysis.	Lecture, debate, problem solving, Experiment frontal, guided discovery	2

Bibliography

1. E. Jaba, Ana Grama: Analiza statistică cu SPSS sub Windows, Ed. Polirom 2004
2. GabrielaBeganu (coordonator) et. alt.Teoria Probabilităţilor şi Statistică matematică Meteor press, Bucureşti 2006
3. Gabriela Beganu (coordonator) et. alt. Teoria probabilităţilor şi statistică matematică – Culegere de probleme Meteor Press, Bucureşti, 2006
4. Decebal Ciurchea, Introducere în procesarea datelor experimentale, Editura BIT, Iaşi 2001
5. Ioan Cuculescu, Teoria Probabilităţilor, Editura ALL 1998
6. **Monica Costea, Analiza statistica pentru stiintele mediului ,Editura Univ. Oradea, 2014, ISBN** *978-606-10-1457-6*

8.3 Laboratory

1. Univariate and bivariate distributions. Scale of measurement. Classification of variables.	Lectures, taking measurements, problems with given situations, statistical programs.	2
2. How are distributed values measured variable. Position indicator. Measures of central tendency. Applications.	Lectures, taking measurements, problems with given situations, statistical programs.	2
3. Indices of dispersion. Measures of variability. Applications.	Lectures, taking measurements, problems with given situations, statistical programs.	2
4. Indices of form. Applications.	Lectures, taking measurements, problems with given situations, statistical programs.	2
5. Representations semigraphical box-and-whisher and steam and leaf. Applications.	Lectures, taking measurements, problems with given situations, statistical programs.	2
6. Calculation combinatorial. Scheme classical probability. Applications.	Lectures, taking measurements, problems with given situations, statistical programs.	2
7. Binomial distribution. Problems. Computerized data processing. Applications.	Lectures, taking measurements, problems with given situations, statistical programs.	2
8. Poisson distribution. . Problems. Computerized data processing. Applications.	Lectures, taking measurements, problems with given situations, statistical programs.	2
9. Normal distribution. Standardization. Normalization of distributions. Applications.	Lectures, taking measurements, problems with given situations, statistical programs.	2
10. Distribution of samples derived from normal. Applications.	Lectures, taking measurements, problems with given situations, statistical programs.	2
11. Distribution. Applications.	Lectures, taking measurements, problems with given situations, statistical programs.	2
12. Student distribution. Applications.	Lectures, taking measurements, problems	2

	with given situations, statistical programs.	
13. Statistical tests. Applications.	Lectures, taking measurements, problems with given situations, statistical programs.	2
14. Assessment of knowledge	Practical examination	2

Bibliography

7. E. Jaba, Ana Grama: Analiza statistică cu SPSS sub Windows, Ed. Polirom 2004
8. GabrielaBeganu (coordonator) et. alt.Teoria Probabilităţilor şi Statistică matematică Meteor press, Bucureşti 2006
9. Gabriela Beganu (coordonator) et. alt. Teoria probabilităţilor şi statistică matematică – Culegere de probleme Meteor Press, Bucureşti, 2006
10. Decebal Ciurchea, Introducere în procesarea datelor experimentale, Editura BIT, Iaşi 2001
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12. **Monica Costea, Analiza statistica pentru stiintele mediului ,Editura Univ. Oradea, 2014, ISBN** *978-606-10-1457-6*

* 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

- Course content can be found in the curriculum specialization Environmental engineering, environmental engineering and biotechnical systems and other universities that have accredited the specializations. During the course builds useful knowledge both environmental officers in local authorities, industry and companies active in the management of environmental factors.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the final grade
10.4 Course	Knowledge of theoretical concepts delivered in class	Evaluation of theoretical knowledge	70%
10.5 Seminar			
10.6 Laboratory	The ability to make measurements with the instruments, computerized statistical processing of a data set	Assessment of practical skills	30%
10.7 Project			
10.8 Minimum standard of performance			

01.10.2020

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