UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
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No._____of _____ **USAMV form 0703010111**

SUBJECT OUTLINE

1. Information on the programme

1.1. Higher education institution	University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca
1.2. Faculty	Food Science and Technology
1.3. Department	Food Science
1.4. Field of study	Food Engineering
1.5.Education level	Bachelor
1.6.Specialization/ Study programme	Food Engineering
1.7. Form of education	Full time

2. Information on the discipline

2.1. Name of the discipline	Probabilities and statistics							
2.2. Course coordinator				Assoc. Prof. eng. Laura Stan, PhD				
2.3. Seminar/ laboratory/ project coordinator				Assoc. Prof. eng. Laura Stan, PhD				
2.4. Year of study	**1**	2.5. Semester	**2**	2.6. Type of evaluation	Continuous	2.7. Discipline status	Content[2]	FD
							Compulsoriness[3]	CD

3. Total estimated time (teaching hours per semester)

3.1. Hours per week – full time programme	4	out of which: 3.2. lecture	2	3.3. seminar/ laboratory/ project	2
3.4.Total number of hours in the curriculum	56	Out of which: 3.5.lecture	28	3.6.seminar/laboratory	28
Distribution of the time allotted					hours
3.4.1. Study based on book, textbook, bibliography and notes					10
3.4.2. Additional documentation in the library, specialized electronic platforms and field					1
3.4.3. Preparing seminars/ laboratories/ projects, subjects, reports, portfolios and essays					19
3.4.4.Tutorials					8
3.4.5.Examinations					6
3.4.6. Other activities					0
3.7. Total hours of individual study	44				
3.8. Total hours per semester	100				
3.9. Number of credits[4]	4				

4. Prerequisites (is applicable)

4.1. curriculum-related	Algebra, analysis mathematics, informatics, special mathematics
4.2. skills-related	The student should have and basic computer skills.

5. Conditions (if applicable)

5.1. for the lecture	Lecture room, video projector, blackboard. The course is interactive; students can ask questions regarding the content of lecture. Academic discipline requires compliance with the start and end of the course. Any other activities during the lecture are not allowed, mobile phones will be turned off.
5.2. for the seminar/ laboratory/ project	Laboratory for food sensory analysis equipped with computers. The deadline for submitting the laboratory work or project is set by the coordinator of the lab works in agreement with the students. Requests for delayed handed in of the projects are accepted only for objective reasons. Also, in case of late submission of laboratory works or projects, the scores will decrease accordingly with 1 point / day of delay.

6. Specific competences acquired

Professional competences	CP1.1. Description and application of cpncepts, basic methods and principles in probabilities and statistics. CP1.2. Explanation and interpretation of statistical concepts, processes, probabilities models and statistical methods based on fundamental knowledge about the composition, structure, proprerties and transformations of food components based on their interaction with other systems from food chain C1.4. Evaluation of qualitative and quantitative characteristics, performances and limits of the food chain CP2.4. Critical analysis, evaluation of characteristics, performences and limits of processes and equipments in food chain. CP3.4. Evaluation according to the existing standards of performance through the monitorization system used in food chain.
Transversal competences	CT.1 To prove resilience, discipline, efficiency and responsibility, as well as work ethics, creativity, common sense and critical thinking problem solving, to identify correlations between technological processes, biochemical processes and changes n the food matrix and sensory quality. CT.2 To involve in research activities and documentation in the field of sensory analysis and prove dedication to improve the sensory quality of foods CT3. To demonstrate the empathic capacities of interpersonal communication and to assume specific attributions in carrying out the group activity as well as the ability of communication and inter-relationship within a team in order to solve or mediate individual / group conflicts, optimal time management.

7. Course objectives (based on the list of competences acquired)

7.1. Overall course objective	To acquire the basic knowledge of probabilities and statistics in the study of the quality analysis events from food industry (analysis of raw material, of final products, qualiy control during the processes etc) by highlighting the causes of the noticed events and and prove the variability of each noticeable cause.
7.2. Specific objectives	To know the specific terminology used in probabilities and statistics. To develop aptitudes of identification and framing of complex proababilities. To form the necessary skills to resolve probability problems. To know the rules of recording and organization of data used in current analysis according to the products and/or scientific experiments. To know the statistical indicators (tendency, dispersion and form). To apply correctly the statistical methods and perform data interpretation. To develop a research plan, to work and interpret data from an experiment.

8. Content

8.1. LECTURE **Number of hours – 28**	**Teaching methods**	**Notes**
Elements of statistics.	Interactive lecture, Examples, applications, team work, conversation, demonstration.	1 lecture (2h)
Experimental design.		1 lecture (2h)
Data collection and organization.		1 lecture (2h)
Descriptive statistics.		1 lecture (2h)
Errors in statistics control.		1 lecture (2h)
Elements of estimation theory.		1 lecture (2h)
Statistical hypothesis.		1 lecture (2h)
Analysis of variance (ANOVA)		1 lecture (2h)
Analysis of covariance.		1 lecture (2h)
Elements of probabilities.		1 lecture (2h)
Classic schemes of probabilities.		1 lecture (2h)
Random variables.		1 lecture (2h)
Distributions.		1 lecture (2h)
Numerical characteristics of random variables.		1 lecture (2h)

8.2. SEMINARS **Number of hours – 28**	**Teaching methods**	**Notes**
Data collection and organization – exercices and aplications.	Practical evaluation of food samples, discussions, data interpretation	1 seminar (2h)
Random variables – exercices and aplications.		1 seminar (2h)
Frequencies absolute, relative and percentual – exercices and aplications.		1 seminar (2h)
Graphical reprezentation of statistical series– exercices		1 seminar (2h)

and aplications. Statistical indicatiors of tendency– exercices and aplications. Statistical indicatiors of dispersion. Box and Wiskers Chart – exercices and aplications. Analysis of variance. F Test – exercices and aplications. „t" Test – exercices and aplications. Classical schemes of probabilities – exercices and aplications. Distributions – exercices and aplications. Numerical characteristics of random variables – exercices and aplications. Final evaluation of knowledges		1 seminar (2h) 1 seminar (2h) 1 seminar (2h) 2 seminars (4h) 2 seminars (4h) 1 seminar (2h) 1 seminar (2h) 1 seminar (2h)

Compulsory bibliography:

1. Handwritten notes from courses and laboratories
2. Bogdan Ileana, Stan Laura, 2020, Prelucrarea statistică a datelor–manual didactic, Ed. AcademicPres, Cluj-Napoca
3. Bogdan Ileana, Stan Laura, 2016, Prelucrarea statistică a datelor – îndrumător pentru seminar, Ed. AcademicPres, Cluj-Napoca
4. Rotaru Gabriela, Borda Daniela, 2002, Controlul statistic în industria alimentară, Ed. Academica, Galaţi

Optional bibliography:

1. Ceapoiu N.; Metode statistice aplicate în experienţele agricole şi biologice, Ed. Agrosilvică, Bucureşti, 1958,
2. Merce E., Fl. Urs, C. Merce, Statistică, Ed. AcademicPres®, Cluj-Napoca, 2001
3. Micula Maria, Suciu Corina, Statistica biologică şi iniţiere în informatică, Tipo Agronomia, 1995
4. Snedecor G.W. Metode statistice aplicate în cercetările de agricultură şi biologie, Ed. Didactică şi Pedagogică, Bucureşti, 1974
5. Steinbach M., Prelucrarea statistică în medicină şi biologie, Ed. Academiei Romane, Bucureşti, 1961

9. Corroborating the course content with the expectations of the epistemic community representatives, of the professional associations and of the relevant stakeholders in the corresponding field

The study of probabilities nad statistics is similar to the content of other faculties of the same field of study (food science and technology) and is continuous updated based on new discoveries in the field and foolowing the guidelines of food producers and researchers. The content of the topic gives the student skills to systematically organise the data and to verify the qualitative and technological conformity of the products.

10. Assessment

Type of activity	10.1. Assessment criteria	10.2. Assessment methods	10.3. Percentage of the final grade
10.4. Lecture	Evaluation of overall acquired knowledge Knowledge of specific terminology, sampling, data collection and organization Knowledge of the principles and methods of probability and statistics The ability to choose the right method for problem solving Ability to work with lab data, technological flow and solve the problems Ability to interpret the data	Continuous evaluation	50%
10.5. Laboratory/seminar	Correctness in application of the knowledge. Correct use of statistical programs and formulae. Coherent individual aplications of the knowledge with concrete results. Ability to use basic formulae in a	Continuous evaluation Final colloquium	50%

	statistical program		
10.6. Minimum performance standards			
Problem solving. Data interpretation.			

[1] Education levels- choose of the three options: Bachelor/ * Master/Ph.D.

[2] Discipline status (content)- for the undergraduate level, choose one of the options:- **FD** (fundamental discipline), **BD** (basic discipline), **CS** (specific disciplines-clinical sciences), **AP** (specific disciplines-animal production), **FH** (specific disciplines-food hygiene), **UO** (disciplines based on the university's options).

[3/] Discipline status (compulsoriness)- choose one of the options – **CD** (compulsory discipline) **OD** (optional discipline) **ED** (elective discipline).

[4] One credit is equivalent to 25-30 hours of study (teaching activities and individual study).

[5 / *] Disciplines: AK- Advanced knowledge, CT- Complementary Training, S- Synthesis

Filled in on
10. 09. 2021

Course coordinator
Assoc. Prof. eng. Laura Stan, PhD

Seminar coordinator
Assoc. Prof. eng. Laura Stan, PhD

Subject coordinator
Assoc. Prof. eng. Laura Stan, PhD

Approved by the
Department on
22.09.2021

Head of the Department
Prof. Dr. Ramona SUHAROSCHI, PhD

Approved by the Faculty
Council on
28.09.2021

Dean
Prof. Dr. Elena Mudura, PhD