UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
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No._____of _____ **USAMV form 0703010104**

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/IPA
1.7. Form of education	Full time

2. Information on the discipline

2.1. Name of the discipline	**SPECIAL MATHEMATICS**							
2.2. Course coordinator	Lect. dr. Rus Cristina Olimpia, PhD							
2.3. Seminar/ laboratory/ project coordinator	Lect. dr. Rus Cristina Olimpia, PhD							
2.4. Year of study	I	2.5. Semester	**I**	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					20
3.4.4. Tutorials					7
3.4.5. Examinations					6
3.4.6. Other activities					
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	It's not necessary
4.2. skills-related	The student should have minimal knowledge of mathematical calculus and basic computer skills.

5. Conditions (if applicable)

5.1. for the lecture	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. We do not allow any other activities during the lecture, mobile phones will be turned off. In the case of the didactic activity carried out online, the teaching methods are adapted.
5.2. for the seminar/ laboratory/ project	During practical works, each student will develop an individual activity with laboratory materials (made available in the book that describes the laboratory work). Academic discipline is imposed throughout the course of practical works.

6. Specific competences acquired

Professional competences	CP1.1. Description and application of concepts, basic methods and principles in probability CP1.3. Application of fundamental concepts, principles and techniques in probabilities to explain and interpret problems in the field of applicability
Transversal competences	CT.1 Application of resilience, discipline, efficiency and responsibility, as well as work ethics, creativity, common sense and critical thinking problem solving, based in principles, norms and values of the ethical code applied in food industry. CT.2 Application of interrelational skills in team work; development and refinement of empathy regarding interpersonal communication and to assume specific attributions in carrying out the group activity in order to treat / resolve individual / group conflicts, as well as the optimal time management.

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

7.1. Overall course objective	Learning by students the basic notions of mathematics with wide applicability in food science and technology, but also in order to prepare the study of probability theory and mathematical statistics.
7.2. Specific objectives	To become familiar and be able to work with the material presented in lectures, with main focus on applications. Improving the skills to make logical connections and to make a reasoning with coherence.

8. Content

8.1. LECTURE **Number of hours – 28**	**Teaching methods**	**Notes**
Elements of linear algebra: Theory of matrices. Calculus.	Lecture Explication Modelling	2h
Determinants. Matrices and determinants.		2h
The inverse of a matrix. Special types of matrices.		2h
Solving systems of linear equations.		2h
Elements of mathematical analysis		
Real - valued functions of a real variables.		2h
Sequences. Limits of functions.		2h
Continuity and derivability. Derivability rules. Basic theorems of Differential Calculus. Applications of derivatives.		2h
Graphs of functions.		2h
Data fitting. Interpolation		2h
Elements of combinatorics.		
Enumerative combinatorics. Methods and principles. Applications.		2h
Arrangements, combinations, permutations.		2h

Applications. Indirect counting. Combinatorial identities. Pascal's triangle. Applications. Applications of combinatorics in Food Science and Engineering.		 2h 4h

8.2. PRACTICAL WORK **Number of hours – 28**	**Teaching methods**	**Notes**
Elements of linear algebra: Theory of matrices. Calculus. Applications. Determinants. Matrices and determinants. Applications. The inverse of a matrix. Special types of matrices. Applications. Solving systems of linear equations. Applications. **Elements of mathematical analysis** Real - valued functions of a real variables. Applications. Sequences. Limits of functions. Applications. Continuity and derivability. Derivability rules. Basic theorems of Differential Calculus. Applications of derivatives. Applications. Graphs of functions. Applications. Data fitting. Interpolation. Applications. **Elements of combinatorics.** Enumerative combinatorics. Methods and principles. Applications. Arrangements, combinations, permutations. Applications. Indirect counting. Combinatorial identities. Pascal's triangle. Applications. Applications of combinatorics in Food Science and Engineering.	The exercise. Heuristic conversation	 2h 2h 2h 2h 2h 2h 2h 2h 2h 2h 2h 2h 4h

Compulsory bibliography:

1. Micula M., 2001 - Matematici aplicate, Ed. Digital Data Cluj
2. Ioana Pop,Rodica Sobolu, Florica Matei, Cristina Rus, Maria Micula, Elemente de analiza matematica, Ed. Academic Pres, 2009, Cluj-Napoca
3. Pop Ioana, Liana Stanca, Matematici generale, Algebră liniara, geometrie analitica şi diferentiale, Ed. AcademicPres, Cluj-Napoca, 2013.

Optional bibliography:

1. Arthur Enghel - Probleme de matematică: strategii de rezolvare, Ed. Gil, 2006.
2. Andreica D., Duca D.I., Purdea I., Pop I. – Matematica de bază, Ed. Studium, Cluj-Napoca, 2002.

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 concordance between the contents of the discipline and the expectations of the employers.

10. Assessment

Type of activity	10.1. Assessment criteria	10.2. Assessment methods	10.3. Percentage of the final grade
10.4. Lecture		Exam - grid test check, each student having a unique subject with the same degree of difficulty	80%
10.5. Seminar		Active and voluntary involvement	20%
10.6. Minimum performance standards			
Solving basic probability problems. Applications.			

[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

Coordinator,
Lecturer Rus Cristina Olimpia, PhD

Filled in on
09.09.2021

Approved by the
Department on
22.09.2021

Head of the Department,
Prof. Ramona Suharoschi, PhD

Approved by the Faculty
Council on
28.09.2021

Dean,
Prof. Elena Mudura , PhD