DISCIPLINE ACADEMIC SHEET

ACADEMIC YEAR 2015 - 2016

1. PROGRAMME DATA

1.1 Higher Education Institution	*UNIVERSITY OF CRAIOVA*
1.2 School	*Automation, Computers and Electronics*
1.3 Department	*Computers and Information Technology*
1.4 Field of Study	*Computers and Information Technology*
1.5 Study Level[1]	*L (licence/ undergraduate)*
1.6 Study Program (name/code)[2] /Calification	*Computers* / L206010101010

2. DISCIPLINE DATA

2.1 Discipline Name				**Mathematical Analysis**					
2.2 Course Activities Holder				Associate Professor Cristian VLADIMIRESCU					
2.3 Practical Activities Holder				Associate Professor Cristian VLADIMIRESCU					
2.4 Study Year	**I**	2.5 Semester	**I**	2.6 Discipline Type (content)[3]	**DF**	2.7 Discipline Conditions (mandatory)[4]	**DI**	2.8Evaluation Type	**E**

3. ESTIMATED TOTAL TIME (hours per semester of teaching activities)

3.1 Number of hours per week	**4**	in which: 3.2 couse	**2**	3.3 seminar/laboratory/project	**2**
3.4 Total hours of curriculum	**56**	in which: 3.5 course	**28**	3.6 seminar/laboratory/project	**28**

3.7 Time distribution	hours
▪ Study after manual, course support, bibliography and notes	**40**
▪ Additional documentation in library, on specialized electronic platforms and field	**10**
▪ Training seminars / labs, homework, portfolios and essays	**10**
▪ Tutoring	**-**
▪ Examinations	**2**
▪ Other activities: consultations, student meetings	**2**

Total hours per individual activities	**64**
3.8 Total hours per semester[5]	**120**
3.9 Number of credits[6]	**5**

4. PRECONDITIONS (where appropiate)

4.1 of curriculum	The students should have mathematical notions learned during the college.
4.2 of competence	There are not necessary.

5. CONDITION (where appropiate)

5.1. of the course	The teaching is explanatory and interactive at the blackboard. One ensures electronic course support and acces to updated documentation. The teaching process has the following structure: ▪ 70% theoretical presentation, based on the couse support; ▪ 30% interactive activity with the students.
5.2. of seminar/ laboratory/project	The seminar is developed interactively with the sudents, by ensuring also electronic support.

6. SPECIFIC LEARNED SKILLS [7]

Professional competences	Through the notions introduced at the course, the examples and the applications from the seminar, the Mathematical Analysis course contributes to the following: - professional competences: ▪ Proper use in professional communication of the eigen concepts of calculability, complexity, programming paradigms and modeling of computer and communications systems. ▪ Theoretical foundation of the features for the designed systems. ▪ Identification of a class of problems and solving methods specific for computer systems. ▪ Using interdisciplinary knowledge, solution patterns and tools to conduct experiments and interpret their results. ▪ Applying solution by means of engineering tools and methods.
Transversal Competences	

7. DISCIPLINE OBJECTIVES (based on the specific learned competences)

7.1 General objective of the discipline	▪ Fundamental discipline, necessary to each special approach. One presents the fundamental notions of numerical sequences and series, functions, differential calculus for vector functions, and different types of integrals: improper integrals, integrals with parameter, curvilinear integrals, double and triple integrals, surface integrals. ▪ Teaching the students to be able to apply differential and integral calculus to solving practical problems. ▪ The aim of the seminar is to fix the theoretical knowledges and to create calculus abilities through practical applications, exersices, and problrems.
7.2 Specific objectives	The achivement of some necessary abilities, as • the study of the convergence of numerical series; • Taylor exapnsion of a given function; • the estimate of first order and upper order differentials of vector functions; • the study of the extrema to vector functions, conditional extrema, and their applications; • the differential of composite and implicit functions; • the estimate of different types of integrals (improper integrals, integrals with parameter, curvilinear integrals, double and triple integrals, surface integrals) and their .

8. CONTENT

8.1 COURSE (content units)	No hours	Teaching methods
Introduction to differential calculus		**Exposition** The teaching is explanatory and interactive at the blackboard. One ensures electronic course support and acces to updated documentation. The teaching process has the following structure: - 70% theoretical presentation, based on the couse support. - 30% interactive activity with the students.
Fundamental sequences; complete metric spaces; Banach contraction principle	**2**	
Serii numericeNumerical series	**2**	
Power series, series expansions	**2**	
Limits and continuity to vector functions	**2**	
Partial derivatives and differentiability	**2**	
Local extrema to vector functions	**2**	
Implicit functions	**2**	
Conditional extrema	**2**	
Introduction to integral calculus		
Riemann integral on the real line	**2**	
Improper integrals	**2**	
Integrals with parameter	**2**	
Curvilinear integrals of first and second kind	**2**	
Double and triple integrals	**2**	
Surface integrals of first and second kind	**2**	
Total	**28**	

Bibliography [8]

1. M. Predoi, D. Constantinescu, M. Racilă, Teme de Analiză Matematică. Teorie şi Aplicaţii, Editura Universitaria Craiova, ISBN 978-606-510-233-0, 2010.
2. M. Predoi, T. Balan, Mathematical Analysis Vol I. Differential Calculus; Vol II.Integral Calculus, Ed. Universitaria, Craiova, 2005.
3. William F. Trench, Introduction to real analysis, Pearson Education, ISBN 0-13-045786-8, 2003.
4. C. Avramescu, C. Vladimirescu, Curs de Calcul Ştiinţific, Repr. Univ. Din Craiova, 2002.

8.2 Practical activities (topics/homework)	No hours	Teaching methods
Introduction to differential calculus		**Solving practical applications** The seminar is developed interactively with the sudents, by ensuring also electronic support.
Fundamental sequences; complete metric spaces; Banach contraction principle	**2**	
Serii numericeNumerical series	**2**	
Power series, series expansions	**2**	
Limits and continuity to vector functions	**2**	
Partial derivatives and differentiability	**2**	
Local extrema to vector functions	**2**	
Implicit functions	**2**	
Conditional extrema	**2**	
Introduction to integral calculus		
Riemann integral on the real line	**2**	
Improper integrals	**2**	
Integrals with parameter	**2**	
Curvilinear integrals of first and second kind	**2**	
Double and triple integrals	**2**	
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2. M. Predoi, D. Constantinescu, M. Racilă, Teme de calcul diferenţial, Ed.Sitech, Craiova, 2003.
3. M. Predoi, D. Constantinescu, M. Racilă, Teme de calcul integral, Ed.Sitech, Craiova, 2003.
4. C. Avramescu, C. Vladimirescu, Curs de Calcul Ştiinţific, Repr. Univ. Din Craiova, 2002.

9. COURSE CONTENT CONJUNCTION WITH EXPECTATIONS OF THE EPISTEMIC COMMUNITY REPRESENTATIVES, PROFESSIONAL ASSOCIATIONS AND EMPLOYEE REPRESENTATIVES IN THE PROGRAM DOMAIN

Developement and and acquiring of notions, methods, and actual mathematical techniques,used to the mathematical modelling of engineering problems.

10. EVALUATION

Activity Type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Final mark weight
10.4 Course	- The understanding the problem - The mathematical formulation ormularea matematică - The solving of the problem	Evaluations: written exam: two hous duration, four practical subjects, each subject being appreciated through a score from 1 to 10, including the free point. The score from the witten exam is the arithmetic mean of the scored obtained to the four subjects. Final mark wight of the written exam: 50%. Evaluations of continuous assessments is made during the semester, based on a witten partial exam, with one hour duration, and two practical subjects, each subject being appreciated through a score from 1 to 10, including the free point. The score from ther partial exam, NPartial, is the arithmetic mean of the scores obtained to the two subjects, and the final mark weight of the partial exam is 30 %.	50%

		The minimum score to promote the partial exam is 5. The students who have promoted the partial exam, will have to solve in the frame of the final written exam, only two (from the existing four) subjects, corresponding to the chapters that have not being assesed in the frame of the partial exam. The score is deduced similarly. The evaluation of the continuous assessments is made during the semester, based on a partial exam, the final mark weight of the partial exam being 30 %.	30%
10.5 Practical activities	**S:** - The developement degree of practical abilities and capability to work with the notions, techniques, and fundamental introduces methods	Final mark weight of the student activity at the seminar/course: 20%. The final mark if deduced by using the formula: **Nfinal = 0.5 x NWrittenExam + 0.3 x NPartial + 0.2 x NSeminar,** where: **Nwitten Exam** is the score obtained at the written exam; **NPartial** is the score obtained at the partial exam; **NSeminar** is the mark for the student activity at tyhe seminar/course. The minimum mark to promote the exam is 5.	20%
10.6 Minimum standard of performance (the minimum knowledge necessary to promote discipline and how to check the knowledge acquiring)			
- Minimum standards to promote: the understanding of the notions and basic terminology. - The obtaining of a minimum 50 % from the continuous assessments and the final exam. - The estimate of the final mark is made by rounding to integer mark of the final scores.			

Date of completion: 25.09.2015

Course Holder

Assoc. Prof. Cristian VLADIMIRESCU, Ph. D.
(signature)

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Applicative activities holder

Assoc. Prof. Cristian VLADIMIRESCU, Ph. D.
(signature)

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Date of approval:

Department Director
Prof. Marius BREZOVAN, Ph. D.
(signature)

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Note:

1) Study level – select one of the possible choices: L (licence or undergraduate)/ M (master)/ D (doctoral).
2) Choose the code as defined by HG nr. 493/17.07.2013.
3) Type (content) - select one of the possible choices:
   - for the licence or undergraduate level: DF (fundamental discipline)/ DD (domain discipline)/ DS (specialty discipline)/ DC (complementary discipline);
   - for the master level: DA (thoroughgoing study discipline)/ DS (synthesis discipline)/ DCA (advanced knowledge discipline).
4) Condition of discipline (compulsoriness) - select one of the possible choices: DI (compulsory discipline)/ DO (optional discipline)/ FC (facultative discipline).
5) Obtained by means of adding the number of hours from 3.4 and 3.7.
6) A credit is equivalent with 25 – 30 hours of study (didactical activities and individual study).
7) The aspect of professional and transversal competences will be considered according to the OMECTS Methodology no 5703/18.12.2011. Competences are those listed in RNCIS (http://www.rncis.ro/portal/page?_pageid=117,70218&_dad=portal&_schema=PORTAL) for the field of study from 1.4 and the study program from 1.6 in which the discipline is enrolled, in this academic sheet.
8) At least one title is recommended to belong to the collective co-ordinating discipline, and at least 2-3 titles to refer relevant papers for the discipline from the national and international circuit, from the library of UCv.