ANNEX 4

PUBLIC INFORMATION REGARDING COMPETITIONS

Entry name	Description
Faculty	**Mathematics and Computer Science**
Departament	Mathematics
Position in the job title list	44
Position	Teaching Assistant
Academic disciplines in the curriculum	Mathematical Analysis (in English) Numerical computation (in English)
Scientific area	Matematică
Job description	The academic position of professor involves: • teaching activities; • scientific research; • administrative activities; • performing specific tasks for the academic community. Conditions that candidates must meet: • possession of a doctor's degree in the field of Mathematics • the scientific track record in accordance with the scientific field of Mathematics and the job description • proof of linguistic certification in the language of instruction at European level C1 or certificates certifying studies or internships in the respective country/language for a cumulative duration of at least 9 months.
Related duties	**Didactic activity:** - seminar, laboratory, projects, consultations, test papers works, exams, the development of didactic material for the subjects that are included in the curricula. **Scientific research activity:** - participation in at least one research seminar at the faculty level; participation in scientific research grants in accordance with faculty-level requirements; - in a period of 3 years, be the author/co-author of at least three publications indexed in international databases, of which at

	least one publication is listed/indexed in the Thomson-Reuters database (Clarivate Analytics); - to participate in at least one scientific event every 3 years, with a scientific contribution published in the volume of the event; - to have at least one international didactic mobility during 3 university years; - meeting the requirements of the (Annex to) the Job Description, at least at the level of the Good qualification. **Administrative activities:** - performing the administrative tasks related to the position, involvement in administrative activities at the level of the department / faculty / university **Services to the academic community:** - participation in the actions of the department, participation in the license and dissertation exams, promotion of admission, solving the tasks set by the department director.
The date and time of the written and oral tests	January 26, 2023,starting at 9:00 a.m
The place of taking the written and oral tests	Written test - January 26, 2023, 9:00 a.m., at the Mathematica Building in Ploiești str., no. 23 - 25, room "pi". Oral test - January 26, 2023, starting at 10:30 a.m., at the Mathematica Building in Ploiești Street, no. 23 - 25, room "pi".
Competition tests, the date, time and place of their taking	The competition consists of: 1. evaluation of the individual file; 2. taking an oral test in English; 3. taking a written test in English. In the evaluation of the individual file, both the scientific criterion (with a weight of 30%) and the didactic one (with a weight of 70%) will be taken into account. The individual file, the oral test and the written test count in equal proportions to the final mark awarded in the individual evaluation report drawn up by each member of the competition committee. Written test - January 26, 2023, 9:00 a.m., at the Mathematica Building in Ploiești str., no. 23 - 25, room "pi". Oral test - January 26, 2023, starting at 10:30 a.m., at the Mathematica Building in Ploiești Street, no. 23 - 25, room "pi". The oral test consists of the presentation of a laboratory project from the disciplines of the position (26.01.2023, starting at 10:30). The competition committee determines the title based on the competition subjects and bibliography and announces it to the candidate/candidates 48 hours before these tests by e-mail and by posting on the faculty's web page, mentioning the date and time of posting, under the signature of the committee

	president. Candidates will take the oral test in alphabetical order. The test must also contain a question session from the committee and/or the public.
Competition topics and bibliography	**Test 1 – Written test.** **Subject:** Mathematical Analysis 1. Standard inequalities (Young, Bernoulli, Hölder, etc.) 2. Sequances of reals (limits, the Eulerian number e, the Stolz-Cesaro theorem) 3. Series (geometric, harminic, generalized harmonic series; convergence test for positive and alternating series) 4. Limits and continuous functions of a single variable 5. Differential calculus for functions of a single variable (mean value theorems, the Taylor polynomial) 6. The topology of $\mathbf{R}^n$ 7. Differential calculus for functions of several variables (partial derivatives, gradient and Hesse matrix) 8. Unconstrained and constrained optimization 9. Integral calculus for functions of a sigle variable 10. Integral calculus for functions of several variables (double and triple integrals, coordinate changes) **Bibliography** 1. ANDRICA D., DUCA I.D., PURDEA I., POP I.: Matematica de bază, Studium, Cluj-Napoca, 2002. 2. COBZAS S., Analiză matematică (Calcul diferenţial), Presa Universitară Clujeana, Cluj-Napoca, 1998. 3. OBERGUGGENBERGER M., OSTERMANN A.: Analysis for Computer Scientists, Springer, 2011. 4. RUDIN, W., Principles of Mathematical Analysis, 3rd ed., McGraw-Hill Inc., New York, 1976. 5. TRIF T.: Probleme de calcul diferenţial şi integral în $\mathbf{R}^n$, Casa Cărţii de Ştiinţă, Cluj-Napoca, 2003. **Test 2 –Oral test.** **Subject:** Numerical Computing 1. Floating-point arithmetic 2. Direct methods for systems of linear algebraic equations. 3. Lagrange interpolation 4. Divided differences methods. Newton form for interpolation polynomials. 5. Numerical Integration. Newton-Cotes formulae. Adaptive quadratures and Romberg method. 6. Numerical Integration. Gaussian formulae. 7. Equations in $\mathbf{R}$. Newton and secant method.

	Bibliography 1. R. Trîmbiţaş – Numerical Analysis in MATLAB, Presa Universitara Clujeana, 2011 2. T. Cătinaş, I. Chiorean, R. Trîmbiţaş – Analiză numerică, Presa Universitara Clujeana, 2011 3. W. Gander, M. Gander, F. Kwok – Scientific Computing. An Introduction Using Maple and MATLAB, Springer 2014. 4. W. Gautschi – Numerical Analysis. 2nd edition, Birkhäuser, 2012. 5. C. Moler – Numerical Computing in MATLAB, SIAM, 2004.
Descrierea procedurii de concurs	On January 24, 2023, at 9:00 a.m., by e-mail and by posting on the faculty's website, the competition committee will notify candidates about the theme of a didactic laboratory activity, which will take place on January 26, 2021. The theme will be from subjects included in the didactic norm of the position. On January 26, 2023, at 9:00 a.m., candidates appear for the written test. The oral exam starts at 10:30. Candidates will take the oral test in alphabetical order. The individual file, the oral test and the written test count in equal proportions to the final mark awarded in the individual evaluation report drawn up by each member of the competition committee. The president of the competition committee draws up a report on the competition, based on the assessment reports drawn up by each member of the competition committee and respecting the hierarchy of candidates decided by the committee. In the report, the candidate with the best results is nominated and the job offer is made.

Director departament,

Prof. univ. dr. Andrei Mărcuș