

INTERVIEW TOPICS FOR ADMISSION
September 2021 session

Study program: MATHEMATICAL MODELING IN SCIENCE AND TECHNOLOGY

September 2021

Topics:

1. Algebraic and Topological Structure of the space \mathbb{R}^n .
2. Differential Calculus in \mathbb{R}^n .
3. Differential Geometry of Space Curves.
4. Differential Geometry of Surfaces.
5. Ordinary Differential Equations of Higher Order.
6. Partial Differential Equations of Higher Order. The Equations of Mathematical Physics.
7. Elements of Measure Theory.
8. Elements of Integration Theory.
9. Complex Derivative. Holomorphic and Analytic Functions.
10. The Complex Integral and Local Representations of Analytic Functions.
11. Principles of Functional Analysis.
 - a. Extending Linear Functionals. The Hahn-Banach Theorem.
 - b. The Closed Graph Principle and the Open Mapping Theorem.
 - c. The Uniform Boundedness Principle and the Banach-Steinhaus Theorem.
12. Linear Bounded Operators on Hilbert Spaces.
 - a. Sesquilinear Forms. Representations of Linear and Continuous Functionals on Hilbert Spaces. The Adjoint of a Linear Bounded Operator on a Hilbert Space.
 - b. Orthogonal Projections, Isometric, Normal and Unitary Operators.

References:

1. Megan M., *Analiză matematică*, Editura Mirton, Timișoara, 1999.
2. Nădăban S., *Calculus- Elemente de calcul diferentia și integral*, Editura Mirton, Timișoara, 2010.
3. Boja N., *Geometrie analitică și diferențială cu aplicații*, Ed. Politehnica, Timișoara 2008.
4. Moș G., Popa L., *Algebră liniară, Geometrie analitică și diferențială*, Editura Universității "Aurel Vlaicu", 2014.
5. G. Cristescu, C. Bota, *Ecuații diferențiale și cu derivate parțiale*, Ed. Mirton, 2001
6. D. Gașpar, N. Suciu : *Analiză complexă*, Editura Academiei Romane, 1999.
7. D. Gașpar, P. Gaspar, *Analiza funcțională*, Ed. de Vest, Timișoara, ed. a 2-a, 2009.