

**GHEORGHE ASACHI TECHNICAL UNIVERSITY OF IASI**  
**Faculty of Machine Manufacturing and Industrial Management**  
**Department of Machine Manufacturing Technology**

Competition for **Associate Professor** position no. **11** in the payroll list of the department

**Courses:** Computer-aided manufacturing - CAM systems  
Computer-aided manufacturing technologies

**COMPETITION TOPICS**

for **Associate Professor** position no. **11** in the payroll list of the department

1. Computer-aided manufacturing – definition, classification, systematic analysis, implementation, automation possibilities, applications.
2. Elements of assisted design and manufacturing – CAD/CAM systems – hardware structure, software solutions, areas of applicability.
3. Models, methods and algorithms used in assisted design and manufacturing – CAM systems.
4. Technological data – definition, classification, composition, classes, machinability, working conditions and technological possibilities.
5. Design of assisted manufacturing technologies on CNC machines – work systems, programming elements.
6. Computer-aided programming of CNC machine tools for planar milling - software solutions, methods, applications.
7. Computer-aided programming of CNC machine tools for turning - software solutions, methods, applications.
8. Computer-aided programming of CNC machine tools for drilling - software solutions, methods, applications.
9. Materials used for processing based on CAM systems - classification, databases.
10. Management of technical data during the lifetime of products based on integrated CAM systems.
11. CAM-based machining strategies – optimization of machining paths, cycle time reduction, minimization of manufacturing errors.
12. CAM integration in sustainable manufacturing and waste reduction – environmental impact assessment, methods, production costs.
13. CAM post-processors – definition, applications, manufacturers.
14. Automation of CAM Machining processes for productivity improvement - methods, valuation, applications.
15. Ultrasonic manufacturing technologies – definition, phenomena, classification, equipment, applications.
16. Thermal plasma manufacturing technologies – definition, phenomena, classification, equipment, applications.
17. Laser beam manufacturing technologies – definition, phenomena, classification, equipment, applications.
18. Additive manufacturing technologies – working principles, classification, methods.
19. Additive manufacturing technologies by fused filament deposition – working principles, classification, materials, applications.
20. Electron beam welding manufacturing technologies - phenomena, classification, equipment, applications.
21. Rapid prototyping using CAM – methods, design evaluation, and applications.
22. Reverse engineering for machining based on CAM systems – definition, methods, and applications.

## References:

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3. Schnakovszky, C., Muscă, G., Zicltil, V. *Ingineria și modelarea sistemelor de producție [in Romanian]*, Technical publishing house, Chisinau, 1998;
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7. Morar, L. *Bazele programării numerice a mașinilor-unelte [in Romanian]*. Cluj-Napoca: UT Pres, 2005;
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9. Catrina D. et al., *Mașini-unelte cu comandă numerică [in Romanian]*, vol. I și II, Universitatea Politehnică Bucharest, 1993;
10. Fetecau, C., Stan, F., Sandu, I.L. *Modelarea și simularea injectării materialelor termoplastice [in Romanian]*. Publishing house: A.G.I.R., 2023;
11. Kalpakjian, S., Schmid, S. *Manufacturing Process for engineering materials*. 5th edition. Pearson Education, 2008, ISBN10 0132272717;
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13. Berce, P., Bâlc, N., Caizăr, C., Păcurar, R., Radu, A.S., Brătean, S., Fodorean, I. *Tehnologii de fabricație prin adăugare de material și aplicațiile lor [in Romanian]*. Romanian Academy Publishing House, Bucharest, 2014;
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15. Gibson, I., Rosen, D., Stucker, B. *Additive Manufacturing Technologies: J D Printing, Rapid Prototyping and Direct Digital Manufacturing*. New York, Springer-Verlag, 2015. ISBN: 978-1-4939-2112-6;
16. Xing, Y., Hao, X., Duan, D. *Advanced Manufacturing Technology and Systems*. MDPI, Micromachines, ISBN978-3-0365-7790-6;
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18. Fetecău, C. *Injectarea materialelor plastice [in Romanian]*. 2<sup>nd</sup> edition. Didactic and Pedagogical Publishing House R. A., Bucharest, pp. 518, 2007, ISBN 978-973-30-1971-8.

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