

## NON-CONVENTIONAL TECHNOLOGIES AND COMPETITIVE MANUFACTURING

### Contact details

Name	<b>Non-conventional Technologies and Competitive Manufacturing</b>	 
Acronym	<b>TENEFABCO</b>	
Logo		 
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### Areas of expertise

**Industrial Engineering** (Laser Beam Machining, Water Jet Cutting, Electrical Discharge Machining, etc.); **Flexible Manufacturing Systems** (CNC Manufacturing Systems); **CAD/CAM Systems** (Applied Industrial design for products and technologies); **Production Engineering** (Innovative Manufacturing for product development and Rapid Tooling technologies); **Automotive Engineering** (Competitive Manufacturing of car components); **Composite Materials** (Manufacturing technologies of complex parts made out of composite materials enforced with carbon fiber); **Engineering and Technologies** (Concurrent engineering, Methodologies and Software tools in Design for Manufacture and Assembly).

### Team

**Prof. Dr. Eng. Nicolae Bâlc**, Assoc. Prof. Dr. Eng. Alexandru Cărean, Assoc. Prof. Dr. Eng. Domnița Frățilă, Assist. Prof. Dr. Eng. Răzvan Păcurar, Lect. Dr. Eng. Paul Bere, Lect. Dr. Eng. Nicolae Panc, Lect. Dr. Eng. Emilia Sabău, Lect. Dr. Eng. Alexandru Popan, Assist. Dr. Eng. Alina Popan.

### Representative projects

**AMaTUC – „Boosting the scientific excellence and innovation capacity in additive manufacturing of the TUC-N”, Horizon 2020**, No. 691787 2016 –2018, budget 999.443 Euro, Coordinator: Prof. Nicolae Bâlc;  
**PECIFCO**, “Implanturi cranio-faciale personalizate obtinute prin prototipare inovativa 3D din materiale compozite ranforsate cu fibra de sticla” Proiect PCCA Contract UEFISCDI nr. 115/2014, PN-II-PT-PCCA-2013-4-0917, Responsable UTC-N, Prof. Nicolae Bâlc;  
**Adm-ERA-„Reinforcing Additive Manufacturing research cooperation between the Central Metallurgical Research and Development Institute and the European Research Area”, FP7** no. 295016 (2011 –2013), budget 496.634 €, (Coordinator UTCN – Prof. Nicolae Bâlc);  
**OP3MET “Optical 3D Metrology – Automated in-line metrology for quality assurance in the manufacturing industry” – FP6** (Contract no. 3721 / 2006-2009) – Co-operative Research Project. Partener – Prof. Nicolae Bâlc;  
**BIOMAPIM “New Biocompatible Materials for customized implants made by SLS and SLM”, PCCE**, contract no. 5/2010, budget 6.790.297 RON; Director – Prof. Petru Berce, Deputy Director – Prof. Nicolae Bâlc;  
**„Research on developing of F1 car”**, International Contract no. 28484/05.11.2012, between TU-Cluj and KODEWA GmbH.”, finalized in 2013, Director: Nicolae Bâlc.

## Significant results

### Representative publications of the last 5 years:

1. N. Balc, S.C. Cosma, J. Kessler, V. Mager, "Research on improving the outer surface quality of the parts made by SLM", Journal: Applied Mechanics and Materials, ISSN: 1662-7482, Vol. 808, pp 199-204, 2015, Trans Tech Publications, Switzerland doi:10.4028/www.scientific.net/AMM.808.199;
2. Leordean, D, Dudescu, C, Marcu, T, Berce, P, Balc, N, Customized Implants With Specific Properties, Made by Selective Laser Melting, Rapid Prototyping Journal, 2013, (ISI, FI:1);
3. Radu, S.A., Leordean, D., Bâlc, N., Nemeş. O., Resin type influence on moulded parts final dimensions, Studia Universitatis Babeş-Bolyai, Chemia, Vol. 60 Issue 2, pp. 219-228, 2015, ISSN 1224-7154, FRI: 0,191;
4. Leordean, D., Radu, S.A., Fratila, D., Berce, P, "Studies on design of customized orthopedic endoprosthesis of titanium alloy manufactured by SLM", in International Journal of ADVANCED MANUFACTURING TECHNOLOGY, Volume: 79, Issue: 5, pp. 905-920, 2015, DOI 10.1007/s00170-015-6873-0, ISSN: 0268-3768, FRI: 1,779;
5. Bere P., Dudescu M. C., Balc N. , Berce P., Nemes O., Iurian A. M., Design and Analysis of Carbon/epoxy Composite Bicycle Handlebar, Revista de MATERIALE PLASTICE, Vol. 51, No. 2, pp. 145-149, 2014, FRI: 0.82.

### Selected Books

1. Berce, P., Bâlc, N., Păcurar R., ş.a., (2014), *Tehnologii de fabricație prin adaugare de material și aplicațiile lor*, Editura Academiei Romane, București, ISBN 978-973-27-2396-8;
2. Berce, P., Bâlc, N., Leordean Dan, ş.a., (2015), *Aplicațiile medicale ale tehnologiilor de fabricație prin adăugare de material*, Editura Academiei Romane, București, ISBN 978-973-27-2591-7.

**International Patent** : „Acting Device”, registered in USA and Germany; N. Balc, D. Leordean

### National Patents :

- „Metoda si dispozitiv de pozitionare si fixare al cadrului circular neurochirurgical stereotaxic”, N. Balc, A. Donca;
- „Procedeu si dispozitiv de obt. a placilor din mat. compozite armate cu fibre”, P. Bere, P. Berce, O. Nemes, N. Balc;
- „Method and Composite Material for Ornamental synthetic plates manufacturing”, E. Sabău, N. Balc, P. Bere.

### PhD thesis

 - submitted in the last 5 years:

1. Cercetări privind îmbunătățirea preciziei și calității suprafeței pieselor metalice, fabricate prin SLM, 2011
2. Cercetări privind turnarea sub vid a pieselor complexe din aluminiu, 2011
3. Cercetări privind fabricația rapidă prin tăiere și frezare cu jet de apă, 2011
4. Cercetări privind optimizarea parametrilor la prelucrarea prin electroeroziune cu fir, 2011
5. Cercetări privind extinderea posibilităților de prelucrare a formelor complexe pe centre de strunjire CNC, 2011
6. Cercetări privind rezistența mecanică a pieselor metalice complexe fabricate prin topire selectivă cu laser, 2012
7. Turnarea sub vid a pieselor metalice complexe în serie mică și unicate, 2012
8. Cercetări legate de controlul digital complex și optimizarea roților dințate cu diferite modificări de profil, 2012
9. Cercetări privind utilizarea tehnicilor dfma în fabricația competitivă a pompelor, 2013
10. Materiale și metode utilizate pentru filtre de fixare a metalelor grele, 2014
11. Eficiența tehnologiilor de fabricație în serie mică a implanturilor dentare, 2014
12. Cercetări privind fabricația prin topire selectivă cu laser a implanturilor medicale bazate pe structuri compozite, 2014
13. Cercetări privind îmbunătățirea fabricației implanturilor medicale din titan, prin topire selectivă cu laser, 2015.

### Others:

- **Chairman** of the MTeM 2013 and MTeM 2015 **International Conference**: „The 12th International Conference on Modern Technologies in Manufacturing”, held in Cluj-Napoca, Romania - <http://www.mtem.utcluj.ro/>;
- Competitive Manufacturing techniques transferred to industrial partners and used in commercial contracts with companies from Germany and England;
- Invited to participate within the **Destaco brain storming** on: The Next Generation of the Automotive Power Clamps , week 13 / 2009, Oberursel – Frankfurt / Germany, Invited by Joachim Liehr, Geschäftsführer / General Manager of DE-STA-CO Europe GmbH <http://www.destaco.com/>;
- **Invited Speaker** at 2009 **Dover Presidents Meeting** (<http://www.dovercorporation.com/>), **N. Bâlc**, Engineering resources in CEE, including Romania, Warsaw, 3-rd March 2009, Poland – Invited by Joachim Liehr, Geschäftsführer / General Manager of DE-STA-CO Europe GmbH <http://www.destaco.com/>.

## The offer addressed to the economic environment

Research & development	Design for Competitive Manufacturing of Industrial Products. Rapid Tooling and Additive Manufacturing
Consulting	External evaluation of products/projects
Training	Training for people from industry, in the following fields: <ul style="list-style-type: none"><li>- Use modern CAD systems for integrated applied design</li><li>- Rapid Tooling</li><li>- Modern Manufacturing Technologies</li></ul>