CNC machine tools operations – Practical course

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9.30-12.30 and 14.30-17.30
University Niccolò Cusano
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To join the course, please, send an email to gennaro.ponticelli@unicusano.it

Abstract

The course includes both theory, on the fundamentals of the main machining techniques and part-programming, and practice, through laboratory activities aimed at designing and machining of mechanical components with milling CNCs.

Machining techniques by chip removal will be described with particular attention to the programming of CNC milling machines. The use of Autodesk Fusion 360 CAM design software for machining preparation and simulation will also be introduced, as well as CNC-interface software XMC.

General Information

- The course will be held in person.
- The classroom will be assigned and communicated to participants after registrations have been collected.
- 3 CFUs will be acknowledged after completing the personal project.

Program

PART 1: Introduction to machining techniques by chip removal
- Turning
- Milling

PART 2: CNC programming
- CNCs classification
- Manual programming

PART 3: CAM modelling
- Fusion 360 CAM modelling
- Machining operation design

PART 4: Milling CNC
- CAM-USER-CNC interface
- CNC preparation

PART 5: Lab project

- Design
- Preparation
- Milling
- Post-processing

PART 6: Personal project

Short Curriculum Vitae

Master Degree in Nanotechnology Engineering in 2014 at the University of Rome 'La Sapienza' and PhD in Industrial Innovation Engineering in 2019 at the University 'Niccolò Cusano'.

Research fellow at the University of Rome 'Tor Vergata' in 2019-2020, then researcher from 2020 at the University 'Niccolò Cusano' as RTDa, RTT, and now as Associate Professor in Manufacturing Technology and Systems. Holder of the courses of Advanced Manufacturing Technology and Manufacturing System Management.

The main research topics are: laser technology for materials processing (milling, bending, joining, surface functionalization, 3D printing), additive manufacturing of polymers (FDM, DLP, SLS) and metals (LPBF), mechanical and thermal characterization of materials, optimization of manufacturing processes using expert systems (fuzzy logic, genetic algorithms), technological feasibility, economic and environmental impact assessment of manufacturing processes.