TECHNOLOGIES AND TURNING OPERATIONS (WORKSHOP)

Code: 322117

Main Scientific Area: Mechanics and industrial processes

Lecturer: Pedro Miguel Barbosa de Miranda

Language of Instruction: Portuguese

Regime: S1

Contact Hours: 60h Total Workload: 105h

ECTS: 6,0

Objectives

1. Describe the technological characteristics of a CNC lathe, its operation and the clamping systems of parts and tools.

2. correctly interpret technical drawings with regard to the operation(s) to be carried out in turning

3. Select the cutting tools to be used for turning and calculate their cutting parameters.

4. Create, test and use a CNC turning program

5. Adjust, operate and control the machining process (around)

6. Perform parts involving cylindrical and tapered turning operations, threads, boxes or throats outside and inside and bleeding

7. Carry out dimensional inspection of shapes, surface condition and other characteristics of the workpiece during the various manufacturing phases, according to technical specifications.

Learning Outcomes

Describe the technological characteristics of a CNC lathe, its operation and the clamping systems of parts and tools.

correctly interpret technical drawings with regard to the operation(s) to be carried out in turning

Select the cutting tools to be used for turning and calculate their cutting parameters.

Create, test and use a CNC turning program

Adjust, operate and control the machining process (around)

Perform parts involving cylindrical and tapered turning operations, threads, boxes or throats outside and inside and bleeding

Carry out dimensional inspection of shapes, surface condition and other characteristics of the workpiece during the various manufacturing phases, according to technical specifications.

Course Contents

Technological characteristics of the lathe and nomenclature of its mechanical parts

Axis, coordinate and tool clamping systems

Clamping processes of parts in the lathe

Designation and technological characterization of the cutting tools used in the lathe

Turning techniques:

Cylindrical and conical, exterior and interior

Facing

External and internal boxes or throats

External and internal threading

Bleeding

Hygiene and safety standards in the operation of a lathe

Operation of a CNC lathe

Recommended Bibliography

Práticas Oficinais, exercícios práticos de torneamento e fresagem, de Américo Costa, Publindústria

Tecnologia de Fabrico, António Manuel Godinho Completo, António José da Fonseca Festas, João Paulo Davim Tavares da Silva, Publindústria

Controlo Numérico Computorizado, Conceitos Fundamentais (3.ª Edição) de Carlos Alberto Moura Relvas,Publindústria

CNC Machining for Engineers and Makers: A Practical Guide to CNC Machining, Charles Davis, NexGen Manufacturing Systems

Manuais equipamentos Haas - Haas Automation® Resource Center, https://diy.haascnc.com/

Learning and Teaching Methods

The integrated and progressive approach of the UC program will allow students to develop the knowledge and skills provided in the objectives, ensuring consistency between the programmatic contents. Application of the knowledge acquired throughout the course in the other disciplines, for the final implementation of the project.

Assessment Methods

Ongoing evaluation: Designing a project by groups

Working Group presentation and final report with final presentation (in printed and digital form).

Assessment methodology: 20% interim presentation, 80% final presentation and report with presentation of

3D and 2D drawings, CAM, Setup Sheet and practical machining of project parts.