SYLLABUS

1. Course title:

Computer Numerical Control Machines programming

2. Code:

3. Cycle of study:

1

4. ECTS credits:

3

5. Type of course:

(•) Mandatory ( ) Elective

6. Prerequisites:

7. Class restrictions:

8. Duration / semester:

1 8

9. Weekly contact hours:

9.1. Lectures: 2

9.2. Seminars: 0

9.3. Laboratory/Practice classes: 1

10. Faculty:

Faculty of mechanical engineering

11. Department/study program:

Production engineering

12. Lecturer:

Prof.Ph.D Muhamed Mehmedović

13. Lecturer's e-mail:

muhamed.mehmedovic@untz.ba

14. Web site:

http://mf.untz.ba/

15. Course aims:

The basis aims of this course realization are:
to introduce students with the basic elements of Computer Numerical Control (CNC) of Machine tools structure, reference points, tooling set up and tool register creating,
to introduce students with CNC Machines programming steps, programming logic as well as programming rules,
to learn main and auxiliary ISO functions of CNC Machines programming,
to learn advanced CNC machines programming techniques and as well as CAD/CAM systems application,
to recognize importance and benefits of CNC Machines application in industrial practice.

16. Learning outcomes:

At the end of this course, the students should be able to:
Understand the role and importance of each of CNC Machines programming steps and as well as reference points,
Understand structure of part program and subprogram and to learn main and auxiliary ISO functions,
Know techniques of putting the tool into the tool storage magazine, tooling set up and tool registers creating,
Understand the essence and significance of tool compensation and tool correction, as well as the necessity of their application,
Make part programs and subprograms for machining processes on CNC Lathes,
Make part programs and subprograms for machining processes on CNC Mills,
Programming CNC machining processes by work cycles application.

17. Course content:

Introductions, Comparison between Numerical Control (NC) and Computer Numerical Control (CNC) technology, CNC Machines, CNC Lathes, CNC Mills, CNC Machining Centers,
Elements of CNC Machines structure and CNC Machine Control types,
Programming definition and steps of CNC Machines programming,
Reference points, Tooling set up and tool register creating,
CNC machining programming principles and rules, Part program and subprogram structure,
Spindle and feed rate control functions, Absolute and incremental CNC Machines programming,
The main and auxiliary CNC Machines programming functions,
Tool compensation and tool correction,
CNC lathes machining processes programming,
CNC mills machining processes programming,
CNC machining center programming,
CNC machines programming by work cycles using,
Basis of CNC machines programming by CAD/CAM system application.

18. Learning methods:

The following methods are planned for successful learning:

- Lectures with the use of multimedia equipment and learning technique with active participation and student discussions,
- Laboratory exercises,
- Graphic papers preparation and working

19. Assessment methods:

Activities during lectures realization and exercises realization,
Semester's paper/homework,
Partially exams during lectures realization,
Final exam at the end of course,
Remedial exams.

Above mentioned assessments are taken into account as a cumulative exam only if the result is positive after each partial exam, and if its portion is more then 50% of the total of required knowledge and skills of this activities.
The exam is successful finished if student has minimum 54% of cumulative points.

20. Assessment components:

Obligations of the student	Points
Presence and activities during course	5
Graphic papers	10
Tests from the theory	20
Tests from the exercises	20
Final examination	45

21. Required reading list:

- Peter Smid: „CNC Promgramming Handbook“, Second Edition, Copyright © 2003.
- Suk-Hwan Suh, PhD; Seong-Kyoon Kang, PhD; Dae-Hyuk Chung, PhD; Ian Stroud, PhD : „Theory and Design of CNC Systems“, 2008 Springer-Verlag London , London 2008.

22. Web sources:

23. Applicable starting from the academic year:

2014/15

24. Adopted in the Faculty/Academy session: