

Course description

Course abbreviation:	KTO/ANC1	Page:	1 / 3
Course name:	Automation of NC Programming 1		
Academic Year:	2023/2024	Printed:	03.06.2024 06:55

Department/Unit /	KTO / ANC1			Academic Year	2023/2024
Title	Automation of NC Programming 1			Type of completion	Exam
Accredited/Credits	Yes, 4 Cred.			Type of completion	Combined
Number of hours	Lecture 2 [Hours/Week] Tutorial 2 [Hours/Week]			Course credit prior to	YES
Occ/max	Status A	Status B	Status C	Counted into average	YES
Summer semester	6 / -	2 / -	2 / -	Min. (B+C) students	5
Winter semester	0 / -	0 / -	0 / -	Repeated registration	NO
Timetable	Yes			Semester taught	Summer semester
Language of instruction	Czech			Internship duration	0
Optional course	Yes			Ev. sc. – cred.	S/N
Evaluation scale	1 2 3 4				
No. of hours of on-premise					
Auto acc. of credit	Yes in the case of a previous evaluation 4 nebo nic.				
Periodicity	K				
Substituted course	None				
Preclusive courses	KTO/PNCS				
Prerequisite courses	N/A				
Informally recommended courses	KTO/ZNC				
Courses depending on this Course	N/A				

Course objectives:

To teach students how to set up and create NC technology and NC data for machining parts using selected CAM systems

Requirements on student

Class credit:

Processing and defence of a semester work

Exam range and content:

1. Written part

NC program processing (in taught NC program language)

2. Oral part

Make out two examinational questions

Content

1. New trends in CNC control systems
2. Parametric programming - meaning and framework of parametric program
3. Programming systems partition, characteristic, programming systems advantage and disadvantage
4. Dialog programming - symbolic programming languages - DIALOG, SinuTrain
5. Dialog programming - lathe turning
6. Dialog programming - milling module
7. CAM - system characteristic, interfaces between other CAD/CAM systems
8. CAM - programming of rotating parts - lathe turning
9. CAM - programming of non-rotating parts - milling
10. CAM - multi axes machining, scribing and user modules of system design
11. CAM - macro framework
12. Data transfer - DNC network, their characteristic and partition

13. Technical economic aspects of NC machines use and manually or dialog programming

Fields of study

Guarantors and lecturers

- **Guarantors:** Ing. Luboš Kroft, Ph.D. (100%)
- **Lecturer:** Ing. Luboš Kroft, Ph.D. (100%)
- **Tutorial lecturer:** Ing. Jan Hnátík, Ph.D. (30%), Ing. Luboš Kroft, Ph.D. (70%)

Literature

- **Basic:** Štulpa, Miloslav. *CNC : programování obráběcích strojů*. První vydání. 2015. ISBN 978-80-247-5269-3.
- **Extending:** Žára, Jiří; Beneš, Bedřich; Sochor, Jiří; Felkel, Petr. *Moderní počítačová grafika*. 2., přeprac. a rozš. vyd. Brno : Computer Press, 2004. ISBN 80-251-0454-0.
- **Recommended:** Janděčka, Karel; Kožmín, Pavel; Česánek, Jiří. *Programování NC strojů*. V Plzni : Západočeská univerzita, 2000. ISBN 80-7082-692-4.

Time requirements

All forms of study

Activities	Time requirements for activity [h]
Practical training (number of hours)	52
Undergraduate study programme term essay (20-40)	20
Preparation for an examination (30-60)	40
Total:	112

assessment methods

Knowledge - knowledge achieved by taking this course are verified by the following means:

- Combined exam
- Seminar work

Skills - skills achieved by taking this course are verified by the following means:

- Seminar work
- Combined exam

Competences - competence achieved by taking this course are verified by the following means:

- Seminar work

prerequisite

Knowledge - students are expected to possess the following knowledge before the course commences to finish it successfully:

- to explain the meaning of individual function NC code
- to describe cutting tool geometry
- to explain the relevance of individual machining technological operations

Skills - students are expected to possess the following skills before the course commences to finish it successfully:

- to create the NC program in ISO code

to propose the cutting tools for individual machining operations

to assemble a manufacturing process for a NC machine tool

Competences - students are expected to possess the following competences before the course commences to finish it successfully:

N/A

N/A

teaching methods

Knowledge - the following training methods are used to achieve the required knowledge:

Lecture with visual aids

Practicum

Task-based study method

Skills - the following training methods are used to achieve the required skills:

Lecture with visual aids

Practicum

Individual study

Competences - the following training methods are used to achieve the required competences:

Practicum

Students' portfolio

learning outcomes

Knowledge - knowledge resulting from the course:

to characterize individual programming systems machining strategies used in workshop

to describe the possibilities of individual workshop programming systems

Skills - skills resulting from the course:

to create NC technology using workshop programming

to create NC technology using simple CAM systems for complex shaped components in two axes

Competences - competences resulting from the course:

N/A

N/A

N/A

Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Engineering	Bachelor	Full-time	Programming of NC Machines	1	2020	2023	Compulsory courses	A	2	LS
Mechanical Engineering	Bachelor	Combined	Engineering Materials and Manufacturing Technology	1	2020	2023	Povinně volitelné před. 3.roč. - blok "B"	B	3	LS
Mechanical Engineering	Bachelor	Full-time	Technology of Metal Cutting	1	2020	2023	Povinně volitelné předměty 3. roč. - LS (odborné zaměření)	B	3	LS