

# Course description

<b>Course abbreviation:</b>	KTO/ANC1	<b>Page:</b>	1 / 3
<b>Course name:</b>	Automation of NC Programming 1		
<b>Academic Year:</b>	2023/2024	<b>Printed:</b>	08.07.2025 17:58

<b>Department/Unit /</b>	KTO / ANC1			<b>Academic Year</b>	2023/2024
<b>Title</b>	Automation of NC Programming 1			<b>Type of completion</b>	Exam
<b>Accredited/Credits</b>	Yes, 4 Cred.			<b>Type of completion</b>	Combined
<b>Number of hours</b>	Lecture 2 [Hours/Week] Tutorial 2 [Hours/Week]			<b>Course credit prior to</b>	Yes
<b>Occ/max</b>	Status A	Status B	Status C	<b>Counted into average</b>	YES
<b>Summer semester</b>	6 / -	2 / -	2 / -	<b>Min. (B+C) students</b>	5
<b>Winter semester</b>	0 / -	0 / -	0 / -	<b>Repeated registration</b>	NO
<b>Timetable</b>	Yes			<b>Semester taught</b>	Summer semester
<b>Language of instruction</b>	Czech			<b>Internship duration</b>	0
<b>Optional course</b>	Yes			<b>Ev. sc. – cred.</b>	S/N
<b>Evaluation scale</b>	1 2 3 4				
<b>No. of hours of on-premise</b>					
<b>Auto acc. of credit</b>	Yes in the case of a previous evaluation 4 nebo nic.				
<b>Periodicity</b>	every year				
<b>Specification periodicity</b>					
<b>Substituted course</b>	None				
<b>Preclusive courses</b>	KTO/PNCS				
<b>Prerequisite courses</b>	N/A				
<b>Informally recommended courses</b>	KTO/ZNC				
<b>Courses depending on this Course</b>	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
<b>Total:</b>	<b>112</b>

## 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