



# UNIVERSITY OF NIŠ

**Course Unit Descriptor**

**Faculty**

Faculty of Mechanical Engineering

## GENERAL INFORMATION

Study program	<b>Manufacturing &amp; Information Technologies</b>
Study Module (if applicable)	-
Course title	CAPP-CAM systems
Level of study	<input type="checkbox"/> Bachelor      × Master's <input type="checkbox"/> Doctoral
Type of course	<input type="checkbox"/> Obligatory × Elective
Semester	<input type="checkbox"/> Autumn      × Spring
Year of study	First
Number of ECTS allocated	6
Name of lecturer/lecturers	Dr Milos S. Stojkovic, Dr Milan Trifunovic
Teaching mode	<input checked="" type="checkbox"/> Lectures      × Group tutorials <input type="checkbox"/> Individual tutorials <input checked="" type="checkbox"/> Laboratory work      × Project work <input type="checkbox"/> Seminar <input type="checkbox"/> Distance learning <input type="checkbox"/> Blended learning      × Other (Workshop tour)

## PURPOSE AND OVERVIEW (max. 5 sentences)

*The purpose of the course is to teach students modern CAPP / CAM systems as well as to train them to use these systems for planning and designing of manufacturing processes, for generating complex executive code for the CNC machines and robots as well as for the integration of complex manufacturing systems.*

*The expected outcome: After completing the course and passing the exam, the student should be able to:*

1. Design, simulate and analyse a wide variety of machining and control operations using modern CAPP / CAM systems.
2. Generate executive code (APT and G-code) for CNC machining and measuring machines as well as operating lists,
3. Apply the direct numerical control (DNC) in the integration of complex manufacturing systems

## SYLLABUS (brief outline and summary of topics, max. 10 sentences)

1. Introduction to the subject - CAx systems and CAPP / CAM application,
2. Input formats of CAD models (CAD Data Exchange) (DXF, IGES, STEP, STL)
3. Output formats of CAPP / CAM model (CL, APT and G-code, operating lists)
4. CAPP methods (variant, generative and hybrid CAPP design methods)

5. The application of databases, rules (knowledge) and expert systems in CAPP / CAM (tool selection, fixtures, equipment, machining geometry and parameters selection and decision-making)
6. The machining geometry (coordinatesystems, machining or surfaces to be control, geom. of tools and toolpaths)
7. Setting technological parameters and CNC system working modes,
8. Analysis, simulation / verification and optimization of machining/control sequences and operations,
9. Design of concurrentmachining operations (group machining sequences) by CAM
10. Direct numerical control of machining and measuring machines and computer systems for managing intelligent and flexible manufacturing systems.

#### LANGUAGE OF INSTRUCTION

- Serbian (complete course)     
  English (complete course)     
  Other \_\_\_\_\_ (complete course)
- Serbian with English mentoring     
  Serbian with other mentoring \_\_\_\_\_

#### ASSESSMENT METHODS AND CRITERIA

Pre exam duties	Points	Final exam	points
Activity during lectures	15	Test of CAPP/CAM skills on in time (Written examination)	35
Practical teaching		Oral examination	15
Two projects (Teaching colloquia)	35	OVERALL SUM	100

\*Final examination mark is formed in accordance with the Institutional documents

Attendance to the lectures and exercises as well as preparation of the project tasks is mandatory