Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Mechanical Engineering Department
2025-2026 Fall Semester
SYLLABUS

Code/Name	MCE 409.1 / Computer Aided Manufacturing
Type	Required
Credit/ECTS	5/5
Hour per Week	3 (3+0+0)
Level/Year	Undergraduate/1
Semester	Fall
Classroom	TBA
Content	Concepts - basics and theory in process planning, different types of numerically controlled machine tools and for which types of products that they are suitable, different types of cutting tools and engineering materials, different types of fixtures and the relation of the fixture design to process planning, interpretation of manufacturing requirements for selecting proper manufacturing processes and design of the processes, communication and quality assurance of a manufacturing process, process planning for small and large scale production- design and simulation of manufacturing processes in CAM programs, digital models - standards for digital representation of product and process data, model driven work methods, the roles of man and computer in automation of process planning
Prerequisites	MCE 103 Technical Drawing, MCE 104 Computer Aided Technical Drawing
Textbooks	***Primary*** NexGenCAM, Inc.; HSMWorks, ApS. (2012). Fundamentals of CNC Machining: A Practical Guide for Beginners [PDF]. Retrieved from Titans of CNC Academy: https://academy.titansofcnc.com/files/Fundamentals_of_CNC_Machining.pdf ***Supplementary*** TL Anderson, Fracture Mechanics Fundamentals and Applications, Taylor & Francis, 3rd edition, 2005
Objectives	• To understand cam fundamentals • To generate toolpaths from cad models • To simulate and validate manufacturing processes • To apply standards, tolerances, and machine constraints
Course Outcomes	In this course you will be able to: CO1 Account for theory of process planning, which activities that are included, in which order and their relation to each other CO2 Explain and give examples of how type of product, manufacturing requirements and available manufacturing equipment influences the decisions that are taken in the process planning CO3 Explain how digital models and computer-aid are used in process planning CO4 Demonstrate practical skills in using a cam program CO5 carry out a process planning process which includes choice of: machine, setup, manufacturing process, tools, method parameters

Weekly Schedule of Topics

W	Topic
1	Introduction
2	CNC Process Overview & Shop Safety
3	CNC Tools
4	CNC Tools
5	Coordinate Systems

6	CNC Programming Language
7	CNC Programming Language
8	CNC Operation
9	CNC Operation
10	2D Milling Toolpaths
11	2D Milling Toolpaths
12	CNC Turning
13	CNC Turning
14	3D Toolpaths

Professional Contribution	Ability to comprehensively explain engineering principles associated with the fracture mechanics of various construction materials

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	3	2	0	1	0	1	2	2	2	3
CO2	2	3	2	0	1	0	3	4	2	2	1
CO3	3	4	2	0	4	0	4	4	2	2	3
CO4	3	5	5	0	3	0	4	4	2	2	1
CO5	4	4	2	0	5	0	4	4	2	2	4

* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

Special Conditions	• Students work in groups for assignment. • The consequence of violation of the attendance rule is to receive a grade of **NA.**
Requirements	Basic knowledge of a dynamic analysis software
Evaluation	Midterm Exam 50% Final Exam 50% Total 100%
Rubric	A rubric will be announced after the exams based on the details of the answer keys.
Course Policy	1. You must attend at least 70% of the sessions including add-drop period. 2. Be in the class on time. 3. English should always be used to communicate with one another. 4. Mobile phone should be switched off and put away during the class. 5. You cannot talk to your friends during class no matter what the subject is.
Cheating & Plagiarism	• Copying or letting someone to copy your work on exams, assignments, or reports is cheating. • Cutting and pasting text, figures and tables from the web sources or any other electronic source is plagiarism. • The consequence of academic dishonesty is to receive a grade of **F** for the course.

Instructor

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Room	220	Office Hours	TBA

Prepared by Fatih Darıcık on August 27, 2025