Course Description

1 General information

Course name	Computer Aided Manufacturing CAD/CAM
Course code	CAD/CAM
Office hour	Thursdays 12:00 PM-1:50 PM or by appointment
Credit hour	3
Course instructor	Professor Sam Ghalambor
Office number	N501
Email address	sam.ghalambor@scupi.cn

2 Prerequisites

- Fundamentals of technical drawing

3 Program

Type		Classes	Labs	Computer labs	Project	Seminar
Hours	0	48 hrs	0	15 hrs	3	0

4 Contents

Computer labs		
No.		Hours
1	Manufacturing documentation including process plans, instruction sheets, set-up documentations. Management of manufacturing documentation	3
2	The basic knowledge about the numerical control as the foundation of Computer Aided Manufacturing: the structure of CNC control system, closed loop feedback control system, machine tool axis systems	3
3	The types of workpieces fixtures and tooling systems used in CAM technologies. CAM packages for metal cutting, additive technologies, laser cutting and grinding	3
4	The types of geometry models used in CAM systems: B-Rep geometry representation, rules for the development of models of parts, stock, fixtures and machine tools	3
5	Computer aided manufacturing solutions for 2.5D milling (including facing, pocketing, groove machining, line following, hole operations) and 5-axis surface machining (rough machining, z-level milling, multi-axis sweeping)	6
6	Computer aided manufacturing solutions for 2-axis turning and multi-head and multi-spindle machining	5
7	Simulation of manufacturing processes	3
8	Automation in Computer Aided Manufacturing based on group technology (GT) principles	2
9	Automation in Computer Aided Manufacturing based on rule technology, definitions of queries for machining operation selection, tool selection and the determination of process parameters	2

Project		
No.		Hours
1	Development of manufacturing process for rotational parts including the preparation of manufacturing documentation, selection of process structure and parameters, CNC machine tool programming and verification in laboratory on physical machine tool	3
2	Development of manufacturing process for prismatic part including the preparation of manufacturing documentation, selection of process structure and parameters, CNC machine tool programming and verification in laboratory on physical machine tool	3

5 Learning Outcomes (skills and knowledge):

- Knowledge on operation of Computer Aided Manufacturing including type of CAM systems and basics of operation of CNC systems
- Ability to develop the machining process for typical parts used in machining industry using the milling and turning technology
- Verification of manufacturing processes in virtual environment
- Student possess the ability to create noncomplex individual project.
- Use engineering design to create solutions that address defined needs, taking into account public health, safety, and well-being, along with global, cultural, social, environmental, and economic considerations.

6 Assessment policy (examination):

a. Mean average of grades received for execution of several practical tasks

7 Literature

1 Zhuming Bi, Xiaoqin WangJ. Computer Aided Design and Manufacturing, 2020 John Wiley & Sons Ltd
2 Ronald Sterkenburg, Garam Kim & Peng Wang, CATIA V5-6 2020 Computer Aided Manufacturing (CAM) Tutorials, eAcademic Books,2021

Grade Dispute Process

If an oblivious error in grading has been made, I will correct it immediately. All disputes regarding severity and judgment must be filed through a written process. All appeals are to be made by submitting a package including the following information:

- A complete copy of your entire quiz or exam.
- A cover page describing which problems are in question and the details of the disputed mark.
- A complete rework of a disputed problem on a separate sheet of paper.

Disability Services

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact me or admin Staff for accommodation.

Academic Integrity

All students are expected to adhere to the standards of academic honesty. Any student engaged in cheating, plagiarism, or other acts of academic dishonesty would be subject to disciplinary action. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity . This may include, but is not limited to the confiscation of the examination of any individual suspected of violating the University Policy.

Statement on Classroom Recording

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

Grades:

Attendance…….10%
Projects..... 60%
Midterm Exam (I) ....April,.24, 2025..... 15%
Midterm Exam (II) .....May, 22, 2025..... 15%
Final Exam..... ..... TBD

90^{+} ..... **A**
80 - 89 ..... **B**
70 - 79 ..... **C**
60 - 69 ..... **D**
59^{-} ..... **F**