a) General			
School	ENGINEERING		
Academic unit	MECHANICAL ENGINEERING		
Level of studies	Undergraduate		
Course code	MM208Y01	*Semester*	8
Course title	**CNC-CAM**		
Independent teaching activities		*Weekly teaching hours*	*ECTS*
Lectures		3	6.0
Laboratory exercises		2	
Course type		Special background	
Course category		Compulsory for Direction 2	
Prerequisite courses		-	
Language of instruction and examinations		Greek/English	
Is the course offered to Erasmus students		Yes	
Course website (url)		https://moodle.uniwa.gr/course/view.php?id=1244	

b) Learning outcomes and general competences

b1. Learning outcomes

Upon successful completion of this course, the student will be able to:

- Describe how CNC machines work
- Selects the appropriate CNC machine for the corresponding job
- Solves subtractive processing problems
- Apply path tool optimization methodologies by using CAM software
- Develops EIA/ISO (G/M), CAM programs.

b2. General competences

- Decision-making
- Working independently
- Team work
- Criticism and self-criticism
- Production of free, creative and inductive thinking

c) Syllabus

Definition and historical development of numerical control (NC). Types and structure of modern machine tools, fields of use of CNC machine tools, Multi-axis machines, Methods and interpolation types, Calculation of cutting conditions (cutting speed, feedrate, cutting depth), Accuracy, repeatability & errors. Programming using ISO G / M code, Creating CAM model based on the corresponding CAD, Post-Processors Operation, Programming using CAM systems, Selecting appropriate cutting tools based on machine tools, Simulation and verification of produced program. Flexible Manufacturing System (FMS) - concept, evaluation, key elements and their functions, applications. Complete production with Computer Integrated Manufacturing (CIM) concept, definition, applications and benefits.

d) Teaching and learning methods - Evaluation

Delivery	Face-to-face, Distance learning
Use of information and communications technology	- Commercial/free/open source software - Multimedia applications - MS Teams/Moodle/eclass

	- Open courses	
Teaching methods	*Activity*	*Semester workload*
	Lectures	26
	Tutorials	
	Laboratory exercises	39
	Computational exercises	
	Individual work	91
	Course total	156
Student performance evaluation	Intermediate assessment (40%) and written final examination (60%), which include short answer questions (40%) and problem solving (60%). For the laboratory, individual and/or group assignments and written examination or presentation of case studies.	

e) Suggested bibliography

1. Fitzpatrick, M. (2014). Machining and CNC technology. Dubuque IA: McGraw-Hill.
2. McMahon, C., Browne, J. (1998). CAD/CAM: principles, practice and manufacturing management. Harlow: Addison-Wesley
3. Skittides Phil. (2000). Basic Principles of Numerical Control and programming CNC machine tools (In Greek) Athens: Synchroni Ekdotiki
4. Suh S.H., Kang S.K., Chung D.H., Stroud I. (2008). Theory and Design of CNC Systems. Springer.
5. Kunwoo L. (1999). Principles of CAD/CAM/CAE Systems. Prentice Hall.