ADDITIVE MANUFACTURING METHODS

1	Course Title:	ADDITIVE MANUFACTURING METHODS
2	Course Code:	MAK4436
3	Type of Course:	Optional
4	Level of Course:	First Cycle
5	Year of Study:	4
6	Semester:	8
7	ECTS Credits Allocated:	3.00
8	Theoretical (hour/week):	2.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. NECMETTiN KAYA
15	Course Lecturers:	Yok
16	Contact information of the Course Coordinator:	Prof. Dr. Necmettin Kaya Bursa Uludağ Üniversitesi Mühendislik Fakültesi Makine Müh. Bölümü Görükle Bursa 224-2941979 necmi@uludag.edu.tr
17	Website:	
18	Objective of the Course:	Students should learn the basics of additive manufacturing, comprehend the basics of additive manufacturing methods, learn the design rules for additive manufacturing and know the limits of additive manufacturing, learn the additive manufacturing process parameters and consider them in product design, see the problems with process simulations before they even start the production phase, and 3D print the designed products. It is the training of mechanical engineers who have production skills by producing in their own equipment.
19	Contribution of the Course to Professional Development:	To contribute to the professional knowledge of students by learning current additive manufacturing methods.
20	Learning Outcomes:	
	1	Ability to choose a production method for the product to be produced by learning the principles and limitations of additive manufacturing technology
	2	The ability to design products in the CAD environment by learning the design rules for additive manufacturing, the ability to make process simulations
	3	Ability to work in teams and share knowledge
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21	Course Content:	
	Course Content:	
Week	Theoretical	Practice
1	Additive manufacturing history	
2	Additive manufacturing methods	
3	Additive manufacturing methods	
4	Polymer material-based methods	
5	Polymer material-based methods	
6	Powder metal based methods	
7	Powder metal based methods	
8	Topology optimization	
9	Generative Design	
10	Design criteria for additive manufacturing	
11	Product design based on polymer material	
12	Powder metal based product design	
13	Support structures	
14	Additive manufacturing process simulations	

22	Textbooks, References and/or Other Materials:	1. A Practical Guide to Design for Additive Manufacturing, Olaf Diegel, Axel Nordin, Damien Motte, Springer. 2. Additive Manufacturing of Metals: The Technology, Rosen, Brent Stucker, Mahyar Khorasani, Springer.

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	2.00	28.00
Homeworks	1	2.00	2.00
Projects	1	14.00	14.00
Field Studies	0	0.00	0.00
Midterm exams	1	8.00	8.00
Others	0	0.00	0.00
Final Exams	1	10.00	10.00
Total Work Load			90.00
Total work load/ 30 hr			3.00
ECTS Credit of the Course			3.00

TERM LEARNING ACTIVITIES	NUMBE	WEIGHT
Midterm Exam	1	20.00
Home work-project	1	20.00
Total	3	100.00
Success Grade		
Contribution of Final Exam to Success Grade		60.00
Total		100.00

Measurement and Evaluation Techniques Used in the Course	Relative evaluation is used.

24	**ECTS / WORK LOAD TABLE**

25	**CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS**															
	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	0	4	1	3	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0

ÖK3	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications					
Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**