

MICROSCALE FLOW AND HEAT TRANSFER

1	Course Title:	MICROSCALE FLOW AND HEAT TRANSFER	
2	Course Code:	MAK5241	
3	Type of Course:	Optional	
4	Level of Course:	Second Cycle	
5	Year of Study:	1	
6	Semester:	1	
7	ECTS Credits Allocated:	6.00	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	-	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. A.ALPER ÖZALP	
15	Course Lecturers:	-	
16	Contact information of the Course Coordinator:	e-posta: aozalp@uludag.edu.tr telefon: 224 294 19 81	
17	Website:		
18	Objective of the Course:	Micro level flow and heat transfer mechanisms will be considered at scientific level and discussed its integration with novel industrial systems.	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	The differences among macro-micro flow systems will be determined.
		2	The influences of structural and fluid properties on micro flows will be determined.
		3	Information on the aims and contents of the related scientific research will be given.
		4	The aim in applying in novel industrial systems will be determined.
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21	Course Content:		
		Course Content:	
Week	Theoretical	Practice	
1	Introduction to micro channel flows.		

2	Basics of mass and momentum transfer at micro level.	
3	Basics of heat transfer at micro level.	
4	The differences of analysis methods at micro and macro level.	
5	Investigation of viscous affects at micro level.	
6	Investigation of diffusion mechanism at micro level.	
7	The solution methods of Boltzman Transport equation for basic flow geometries.	
8	The solution methods of Boltzman Transport equation for basic flow geometries.	
9	Investigation of micro level engineering designs.	
10	Investigation of micro level engineering designs.	
11	Literature based approaches for research applications.	
12	Literature based approaches for research applications.	
Activites		
14	Technology platforms involving micro-flow.	
14	Evaluation of multi disciplinary micro	
Practicals/Labs		
Self study and preperation		
22	Textbooks, References and/or Other	
Homeworks		
Projects		
Field Studies		
Midterm exams		
Others		
Final Exams		
Total Work Load		
23	Assessment	
ECTS Credit of the Course		
Midterm Exam		
Quiz		
Home work-project		
Final Exam		
Total		
Contribution of Term (Year) Learning Activities to Success Grade		
Contribution of Final Exam to Success Grade		
Total		
Measurement and Evaluation Techniques Used in the Course		

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	5	5	5	5	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	5	5	5	5	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	5	5	5	5	0	0	5	0	0	5	0	0	0	0	0	0
ÖK4	5	5	5	5	0	0	0	0	5	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			