TENSOR SPACES AND THEIR APPLICATIONS

1	Course Title:	TENSOR SPACES AND THEIR APPLICATIONS
2	Course Code:	MAT4096
3	Type of Course:	Optional
4	Level of Course:	First Cycle
5	Year of Study:	4
6	Semester:	8
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:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. CENGIZHAN MURATHAN
15	Course Lecturers:	
16	Contact information of the Course Coordinator:	cengiğz@uludag.edu.tr
17	Website:	
18	Objective of the Course:	This lecture represents our effort to present the basic concepts of vector and tensor analysis
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	

	1	Learn Vector space, subsapce, Linear Transformation and cocept of basis
	2	Learn Differentiable manifolds
	3	Learn Riemannian curvature and isometries
	4	Learn contact manifold with respec to Physics
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21	Course Content:	

Course Content:	

Week	Theoretical	Practice
1	Vector space, subsapce, Linear Transformation and cocept of basis	
2	Differentiable manifolds	
3	tangent sapce, vector field and integral curve	
4	Differentiable forms and Lie dervative	
5	Constructing Riemannian metric, Riemann connection	

6	Riemannian curvature and isometries	
7	Huygens Princible and contact elements	
8	Differntial Equations and contact elements	
9	Contact Diffeomorphisms	
10	Darboux Theorem	
11	Hamiltonian Mechanics and Phase space	
12	Symplectic Diffeomorphism	
13	Symplectic and Hamiltonian vector fields	
14	Hypersurfaces of Contact type and symplectic invariants	
22	Textbooks, References and/or Other Materials:	First Steps in Differntial Geometry Andrew McInerny ISSN0172-6056 Springer 2013
23	Assesment	

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00
Contribution of Term (Year) Learning Activities to Success Grade	40.00	
Contribution of Final Exam to Success Grade	60.00	
Total	100.00	
Measurement and Evaluation Techniques Used in the Course		

24 ECTS / WORK LOAD TABLE

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	11	10.00	110.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	15.00	15.00
Others	0	0.00	0.00
Final Exams	1	12.00	12.00
Total Work Load			179.00
Total work load/ 30 hr			5.97
ECTS Credit of the Course			6.00

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	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	0	0	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