



Çanakkale Onsekiz Mart University

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Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Space Time Geometry And Symmetries II	FZ-6008		3 + 0	3.0	7.5

Prerequisites	None
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Language of Instruction	Turkish
Course Level	Third Cycle
Course Type	Elective
Mode of delivery	Face to face
Course Coordinator	Prof. Dr. Hüsnü BAYSAL
Instructors	Prof. Dr. Hüsnü BAYSAL
Assistants	
Course Objectives	Investigate space-time geometry and topologies. Classify space-time models.
Course Content	Space-time concept, Space-time concept and manifold, Lorentz metrics, Tensors on manifolds, connection and curvature, The method of variation, space-time topology, space-time topology, space-time topology and geometry of space-time formation of symmetry in space-time and and symetry breakings, relation of geometry and symmetry symmetry breaking and particle formations forms of cosmic matter energy meomentum tensors
Course Learning Outcomes	1) Explain concept of space-time 2) Investigate space-time topology 3) Calculate symmetry 4) Interpret curvature 5) Describe energy momentum tensors

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Space-time concept	Face to face	
2. Week	Space-time concept and manifold	Oral lecturing	
3. Week	Lorentz metric	Oral lecturing	
4. Week	Tensors on manifolds	Oral lecturing	
5. Week	Connection and curvature	Oral lecturing	
6. Week	The method of variation	Oral lecturing	

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Physics (PhD)

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7. Week	Space-time topology	Oral lecturing	
8. Week	Space-time topology	Oral lecturing	
9. Week	Midterm exam	Written exam	
10. Week	Formation of symmetry in space-time and and symmetry breakings,	Oral lecturing	
11. Week	Relation of geometry and symmetry	Oral lecturing	
12. Week	Symmetry breaking and particle formations	Oral lecturing	
13. Week	Forms of cosmic matter	Oral lecturing	
14. Week	Energy momentum tensors	Oral lecturing	
15. Week	General review	Face to face	
16. Week	Final exam	Written exam	

RESOURCES

Recommended Sources
Özemer, A. Y. Kozmolojiye Giriş. İst. Üniv. Fen Fak. Yayınları No: 161, (1981)
Tai-Pei Chang, Relativity, Gravitation and Cosmology, Oxford University Press. (2005)
Carroll, S. Spacetime and Geometry: An Introduction to General Relativity. Addison Wesley (2003)
Callahan, J. J. The Geometry of Spacetime: An Introduction to Special and General Relativity. Springer (2000)

ASSESSMENT

Measurement and Evaluation Methods and Techniques		
Midterm exam 40%, Final exam 60%		
In-Term Studies	Quantity	Percentage
Mid Term Exam 1	1	40
Total	1	40
End-Term Studies	Quantity	Percentage
Final Exam	1	60
Total	1	60
Contribution Of In-Term Studies To Overall Grade		40
End-Term Studies		60
Total		100

COURSE CATEGORY

Course Category	Percentage
Support Courses	% 100

CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES

Programme Outcomes	Contribution Level	DK1	DK2	DK3	DK4	DK5
<u>PY1</u>	3	3	3	3	3	3
<u>PY2</u>	5	5	5	5	5	5
<u>PY3</u>	5	5	5	5	5	5
<u>PY4</u>	5	5	5	5	5	5

<u>PY5</u>	5	5	5	5	5	5
<u>PY6</u>	5	5	5	5	5	5
<u>PY7</u>	3	3	3	3	3	3
<u>PY8</u>	3	3	3	3	3	3
<u>PY9</u>	4	4	4	4	4	4
<u>PY10</u>	4	4	4	4	4	4
<u>PY11</u>	3	3	3	3	3	3
<u>PY12</u>	4	4	4	4	4	4
<u>PY13</u>	3	3	3	3	3	3
<u>PY14</u>	3	3	3	3	3	3
<u>PY15</u>	4	4	4	4	4	4

*DK = Course's Contribution.

	0	1	2	3	4	5
Level of contribution	None	Very Low	Low	Fair	High	Very High

ECTS CREDITS AND COURSE WORKLOAD

Event	Quantity	Duration (Hour)	Total Workload (Hour)
Class Hours (14 weeks)	14	3	42
Final Exam Preparation	1	20	20
Further Study	6	2	12
Preliminary Study	14	7	98
Mid Term Exam Preparation	1	20	20
Mid Term Exam 1	1	2	2
Final Exam	1	2	2
Total Workload			196
Total Workload / 25.5 (s)			7.69
ECTS Credit of the Course			8