Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Geometry And Topology In Physics	FZ5030		3 + 0	3.0	7.5

Prerequisites	None

Language of Instruction	Turkish
Course Level	Second Cycle
Course Type	Elective
Mode of delivery	Face to face
Course Coordinator	Assist. Prof. Dr. Sezgin AYGÜN
Instructors	Prof. Dr. İsmail TARHAN Prof. Dr. İhsan YILMAZ
Assistants	
Course Objectives	Learn how to use the concepts of topology and geometry in physics.
Course Content	Vector spaces, Stokes theorem, Conservation laws and Rham cosmology, Introduction to space-time geometry Vector Algebra, Tophologycal spaces, Homology, Homothopi groups, Differentionable manifolds, Vectors and Tensors, Exterior forms and Calculation, Stokes theorem, Conservation laws and Rham cosmology, Parallel transform, Covariant derivative, Geodesics, Introduction to space-time geometry are the contents of this lesson.
Course Learning Outcomes	1) to take a view about vector space 2) to have knowledge about vector algebra 3) to learn definition of tophologycal spaces 4) to learn homology, homothopi groups 5) to learn differentionable manifolds 6) to learn Stokes theorem 7) to learn conservation laws and Rham cosmology

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Vector spaces, , Stokes theorem, conservation laws and Rham cosmology, introduction to space-time geometry	Oral lectures with discussions	
2. Week	Vector Algebra	Oral lectures with discussions	
3. Week	Tophologycal spaces	Oral lectures with discussions	

Quick Access

Physics (Master)
- Qualification Awarded
- Level of Qualification
- Qualification Requirements and Regulations
- Specific Admission Requirements
- Recognition of Prior Learning
- Profile of the Program
- Program Key Learning Outcomes
- Occupational Profile of Graduates
- Access to Further Studies
- Course Structure & Credits
- Exam Regulations & Assessment & Grading
- Graduation Requirements
- Mode of Study
- Programme Director(or Equivalent)
- Evaluation Questionnaire
- TYYÇ

Course Information
- Course Information
- Weekly Course Content
- Resources
- Course Category
- CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES
- ECTS credits and course workload

4. Week	Homology, homothopi groups	Oral lectures with discussions	
5. Week	Differentionable manifolds	Oral lectures with discussions	
6. Week	Vectors and tensors	Oral lectures with discussions	
7. Week	Vectors and tensors	Oral lectures with discussions	
8. Week	Exterior forms and calculation	Oral lectures with discussions	
9. Week	Stokes theorem	Oral lectures with discussions	
10. Week	Conservation laws and Rham cosmology	Oral lectures with discussions	
11. Week	Parallel transform	Oral lectures with discussions	
12. Week	Covariant derivative	Oral lectures with discussions	
13. Week	Geodesics	Oral lectures with discussions	
14. Week	Introduction to space-time geometry	Oral lectures with discussions	
15. Week	general review	Oral lectures with interactive discussions, Applications	
16. Week	General review	Oral lectures with interactive discussions, Applications	

RESOURCES

Recommended Sources
Fred H. Croom, (2008) Principles of Topology, The Saunders Series, Turner, Addison Wesley Publishing Company
Wang Rong, Chen Yue (1998) An introduction to differential geometry and topology in mathematical physics,
Massey, William S. (1991), A basic course in algebraic topology , Publisher: Springer GTM. UWA Library
Sean Carroll, (2003), Spacetime and Geometry, An Introduction to General Relativity, ISBN-10: 0805387323

ASSESSMENT

Measurement and Evaluation Methods and Techniques
Midterm exam, Final exam

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	DK6	DK7
PY1	5	5	5	5	5	5	5	5

PY2	5	5	5	5	5	5	5	5
PY3	5	5	5	5	5	5	5	5
PY4	5	5	5	5	5	5	5	5
PY5	5	5	5	5	5	5	5	5
PY6	5	5	5	5	5	5	5	5
PY7	5	5	5	5	5	5	5	5
PY8	5	5	5	5	5	5	5	5
PY9	5	5	5	5	5	5	5	5
PY10	5	5	5	5	5	5	5	5
PY11	5	5	5	5	5	5	5	5
PY12	5	5	5	5	5	5	5	5
PY13	5	5	5	5	5	5	5	5
PY14	5	5	5	5	5	5	5	5
PY15	5	5	5	5	5	5	5	5

*DK = Course's Contrubution.

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

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ECTS CREDITS AND COURSE WORKLOAD

Event	Quantity	Duration (Hour)	Total Workload (Hour)
Class Hours (14 weeks)	14	3	42
Final Exam Preparation	1	18	18
Mid Term Exam Preparation	1	18	18
Further Study	6	2	12
Assignment 1	16	3	48
Presentation/Seminar	6	2	12
Preliminary Study	16	2	32
Final Exam	1	2	2
Mid Term Exam 1	1	2	2
Assignment 2	3	2	6
		Total Workload	192
		Total Workload / 25.5 (s)	7.53
		ECTS Credit of the Course	8