Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Relativistic Field Theory II	FZ5020		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	Assist. Prof. Dr. Melis ULU DOĞRU
Assistants	
Course Objectives	To learn the topics of the motion of the particle in gravitational field and gravitational field equations.
Course Content	Gravitation field in relativistic and nonrelativistic mechanics, Curvilinear coordinates, metric tensor, Gravitation field equations, curvilinear tensor , properties of curvilinear tensor, Energy-momentum tensor, Einstein's equations, Energy-momentum pseudo tensors of gravitational field, Motion in centripetal symmetric, gravitational field, Gravitation waves, Relativistic cosmology, red shift, Gravitation stability of isotropic universe Homogen spaces, Planar anisotropic model, Planar anisotropic model and its applications are the contents of this lesson.
Course Learning Outcomes	1) to be able to comprehend motion of a particle in gravitational field 2) to get knowledge about curvature tensor 3) to comprehend energy momentum tensor 4) to learn Einstein field equations and obtain their solutions. 5) to get knowledge about gravitational waves 6) to get knowledge about different cosmological universe models

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Gravitation field in relativistic and nonrelativistic mechanics		
2. Week	Curvilinear coordinates, metric tensor	Oral lectures with interactive discussions	
3. Week	Gravitation field equations	Oral lectures with interactive	

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
- Assessment
- Course Category
- CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES
- ECTS credits and course workload

		discussions	
4. Week	Curvilinear tensor , properties of curvilinear tensor	Oral lectures with interactive discussions	
5. Week	Energy-momentum tensor	Oral lectures with interactive discussions	
6. Week	Einstein’s equations	Oral lectures with interactive discussions	
7. Week	Energy-momentum pseudo tensors of gravitational field	Oral lectures with interactive discussions	
8. Week	Motion in centripetal symmetric gravitational field	Oral lectures with interactive discussions	
9. Week	Gravitation waves	Oral lectures with interactive discussions	
10. Week	Relativistic cosmology, red shift	Oral lectures with interactive discussions	
11. Week	Gravitation stability of isotropic universe	Oral lectures with interactive discussions	
12. Week	Homogen space	Oral lectures with interactive discussions	
13. Week	Planar anisotropic model	Oral lectures with interactive discussions	
14. Week	Planar anisotropic model and its applications	Oral lectures with interactive discussions	
15. Week	General review	Oral lectures with interactive discussions, Applications	
16. Week	General review	Oral lectures with interactive discussions, Applications	

RESOURCES

Recommended Sources
Landau L.D., Lifshitz E.M.(1975), The Classical Theory of the Fields vol. 2, Pergamon Pres.
C.W. Misner, K.S. Thorne, J.A.Wheeler (1970), Gravitation, W.H. Freeman and Company.
Tai-Pei Chang(2005), Relativity, Gravitation and Cosmology, Oxford University Press

ASSESSMENT

Measurement and Evaluation Methods and Techniques		
Homework, Midterm exam, Final exam		
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	DK6
PY1	5	5	5	5	5	5	5
PY2	5	5	5	5	5	5	5
PY3	5	5	5	5	5	5	5
PY4	5	5	5	5	5	5	5
PY5	5	5	5	5	5	5	5
PY6	5	5	5	5	5	5	5
PY7	5	5	5	5	5	5	5
PY8	5	5	5	5	5	5	5
PY9	5	5	5	5	5	5	5
PY10	5	5	5	5	5	5	5
PY11	5	5	5	5	5	5	5
PY12	5	5	5	5	5	5	5
PY13	4	4	5	4	5	5	5
PY14	5	5	5	5	5	5	5
PY15	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	28	28
Mid Term Exam Preparation	1	28	28
Assignment 1	16	2	32
Presentation/Seminar	4	1	4
Further Study	16	3	48
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