Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Group Representations II	FZ-6014		3 + 0	3.0	7.5

Prerequisites	None
Language of Instruction	Turkish
Course Level	Third Cycle
Course Type	Elective
Mode of delivery	Face to face
Course Coordinator	Assist. Prof. Dr. Melis ULU DOĞRU
Instructors	Prof. Dr. İhsan YILMAZ Prof. Dr. İsmail TARHAN Assist. Prof. Dr. Melis ULU DOĞRU Assist. Prof. Dr. Sezgin AYGÜN
Assistants	
Course Objectives	The course includes representation theory. It aims that the theory can be applied on physical applications.
Course Content	Lie groups Lie algebras Symmetry groups of differential equations Invariant forms on Lie groups Ideals solvability and nilpotency possibility Cartan subalgebras Cartan subalgebras and root spaces Coxeter-Dynkin diagrams Representation theory Tensor products Enveloping algebras and Casimir operators Physical applications.
Course Learning Outcomes	1) apply the group theory 2) use the theory to their applications.

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Lie groups	Oral lectures with interactive discussions, Homeworks, Applications, recitation, group study, reading	
2. Week	Lie cebirs	Oral lectures with interactive discussions, Homeworks,	

Quick Access

Physics (PhD)
- 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

		Applications, Pratic, group study, reading	
3. Week	Olber’s paradox, Astronomical distances and age of universe	Oral lectures with interactive discussions, Homeworks, Applications, Pratic, group study, reading	
4. Week	Invariant forms on Lie groups	Oral lectures with interactive discussions, Homeworks, Applications, Pratic, group study, reading	
5. Week	ideals	Oral lectures with interactive discussions, Homeworks, Applications, Pratic, group study, reading	
6. Week	solvability and nilpotency	Oral lectures with interactive discussions, Homeworks, Applications, Pratic, group study, reading	
7. Week	possibility	Oral lectures with interactive discussions, Homeworks, Applications, Pratic, group study, reading	
8. Week	Cartan subalgebras	Oral lectures with interactive discussions, Homeworks, Applications, Pratic, group study, reading	
9. Week	Cartan subalgebras and	Oral lectures with interactive discussions, Homeworks, Applications, Pratic, group study, reading	
10. Week	Coxeter-Dynkin diagrams	Oral lectures with interactive discussions, Homeworks, Applications, Pratic, group study, reading	
11. Week	Representation theory	Oral lectures with interactive discussions, Homeworks, Applications, Pratic, group study, reading	
12. Week	Tensor products	Oral lectures with interactive discussions, Homeworks, Applications, Pratic, group study,	

		reading	
13. Week	Enveloping algebrasand Casimir operators	Oral lectures with interactive discussions, Homeworks, Applications, Pratic, group study, reading	
14. Week	physical applications	Oral lectures with interactive discussions, Homeworks, Applications, Pratic, group study, reading	
15. Week	general review	Oral lectures with interactive discussions, Homeworks, Applications, Pratic, group study, reading	
16. Week	final exam	exam	

RESOURCES

Recommended Sources
Fulton, William; Harris, Joe (1991), Representation theory. A first course, Graduate Texts in Mathematics, Readings in Mathematics, 129, New York
Yurii I. Lyubich. Introduction to the Theory of Banach Representations of Groups. Translated from the 1985 Russian-language edition (Kharkov, Ukraine). Birkhäuser Verlag. 1988

ASSESSMENT

Measurement and Evaluation Methods and Techniques
Mid-term exam, final, other

COURSE CATEGORY

Course Category	Percentage
Support Courses	% 100

CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES

Programme Outcomes	Contribution Level	DK1	DK2
PY1	3	3	0
PY2	4	4	0
PY3	3	3	0
PY4	4	4	0
PY5	4	4	0
PY6	4	4	0
PY7	0	0	0
PY8	0	0	0
PY9	3	3	0
PY10	0	0	0
PY11	4	4	0

PY12	0	0	0
PY13	0	0	0
PY14	0	0	0
PY15	0	0	0

*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	36	36
Assignment 1	16	5	80
Final Exam	1	2	2
Mid Term Exam Preparation	1	30	30
Mid Term Exam 1	1	2	2
		Total Workload	192
		Total Workload / 25.5 (s)	7.53
		ECTS Credit of the Course	8