Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Mathematical Methods In Physics II	FZ-6003		3 + 0	3.0	7.5

Prerequisites	None

Language of Instruction	English
Course Level	Third Cycle
Course Type	Elective
Mode of delivery	Face to face
Course Coordinator	Assist. Prof. Dr. Sezgin AYGÜN
Instructors	Assist. Prof. Dr. Sezgin AYGÜN
Assistants	
Course Objectives	To apply mathematical methods in physics
Course Content	The course includes integral equations, series, calculus of variations, Green function, Bessel function, Gauss equaions, complex functions group theory and applications.
Course Learning Outcomes	1) to describe physical phenomena in terms of mathematics 2) to recognize advanced mathematical techniques which are used in physics 3) to use advanced mathematical techniques in physics problems 4) to get the information about the various functions. 5) to get information about complex functions and its solution methods.

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Differantial equations, classifications, 1. order differential equations	Oral lectures Homeworks, discussions	
2. Week	1. order differential equations, n. order lineer differential equations	Oral lectures Homeworks, discussions	
3. Week	constant and variable coefficient linear differential Equations, Partial Differential Equation	Oral lectures Homeworks, discussions	
4. Week	Serial solutions and solutions methods, power serial and Frobenius serial	Oral lectures Homeworks, discussions	

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

5. Week	Legendre, Bessel, Hermite, Laguerre diferential equations, solution methods and applications	Oral lectures Homeworks, discussions	
6. Week	Gamma Beta functions	Oral lectures Homeworks, discussions	
7. Week	Fourrier serials, Fourrier and Laplace transformations	Oral lectures Homeworks, discussions	
8. Week	Integral equations and their transformations	Oral lectures Homeworks, discussions	
9. Week	Green functions	Oral lectures Homeworks, discussions	
10. Week	Group theory and applications	Oral lectures Homeworks, discussions	
11. Week	Coordinate transformations, tensor algebra and some tensors and applications	Oral lectures Homeworks, discussions	
12. Week	Coordinate transformations, tensor algebra, some special tensors and their applications	Oral lectures Homeworks, discussions	
13. Week	the calculus of variations	Oral lectures Homeworks, discussions	
14. Week	Sturm-Liouville Problems	Oral lectures Homeworks, discussions	
15. Week	general review	Oral lectures Homework, discussions	
16. Week	general review	Oral lectures Homework, discussions	

RESOURCES

Recommended Sources
Mathematical Methods for Physicists (fifth edition), by G.B. Arfken and H.J. Weber (Harcourt Academic Press, 2001)
Complex Variables and Applications, by R.V. Churchill, J.W. Brown, and R.F. Verhey (McGraw-Hill, 1974)
Mathematical Methods of Physics, by J. Matthews and R.L. Walker (Benjamin, 1970)
Fizikte Matematik Yöntemler,Coşkun Önem,Birsen Yayınevi(1982)
Fizik ve mühendilslikte matematik yöntemler, Bekir Karaoğlu, Güven Press, Ankara, 2012
Fizik ve mühendislikte Matematik Yöntemler, Emine Öztürk, Seçkin press, (2011)

ASSESSMENT

Measurement and Evaluation Methods and Techniques		
1 midterm exam 1 final exam 14 homeworks		
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
Core Courses	% 100

CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES

Programme Outcomes	Contribution Level	DK1	DK2	DK3	DK4	DK5
PY1	5	5	5	5	0	0
PY2	5	5	5	5	5	5
PY3	5	5	5	5	0	0
PY4	5	3	4	1	0	0
PY5	5	5	5	5	5	5
PY6	2	3	3	3	0	0
PY7	5	5	5	5	5	5
PY8	5	5	5	5	0	0
PY9	5	5	5	5	0	0
PY10	1	1	1	1	0	0
PY11	5	5	5	5	5	5
PY12	5	5	5	5	0	0
PY13	5	5	5	5	0	0
PY14	5	5	5	5	5	5
PY15	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)
Assignment 1	16	2	32
Class Hours (14 weeks)	14	3	42
Presentation/Seminar	4	1	4
Final Exam Preparation	1	28	28
Mid Term Exam Preparation	1	28	28
Further Study	18	3	54
Mid Term Exam 1	1	2	2
Final Exam	1	2	2

Total Workload	192
Total Workload / 25.5 (s)	7.53
ECTS Credit of the Course	8