Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Stellar Sismology II	FZ-6026		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	Assoc. Prof. Dr. Esin SOYDUGAN
Instructors	Prof. Dr. Osman DEMİRCAN Prof. Dr. Ahmet ERDEM Assoc. Prof. Dr. Esin SOYDUGAN
Assistants	
Course Objectives	Understanding physics of pulsating stars.
Course Content	Why do some stars pulsate? Pulsation mechanism, Period-density correlation, Pulsations in blue and red zones of instability strip. Causes for cessation of pulsation, Relation between pulsation and opacity, Obtain total internal energy of star, Equilibrium in stars (dynamic equilibrium, thermal equilibrium and vibrational equilibrium)-I, Equilibrium in stars (dynamic equilibrium, thermal equilibrium and vibrational equilibrium)-II, Lamb frequency, Brunt Väisälä frequency, Homogeneous Model and Classification of Modes, Helioseismology, Investigation of interior of Sun by Forward and Inverse methods, Determination of seismologic H-R diagram in pulsating stars like Sun, Impact of rotation and metalicity to pulsation, Physics of pulsation in Ap stars.
Course Learning Outcomes	1) Recognize equilibrium condition in stars. 2) Recognize pulsation mechanism. 3) Have knowledge about helioseismology.

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Why do some stars pulsate? Pulsation mechanism.	Oral lectures, homework, practice.	
2. Week	Period-density correlation.	Oral lectures, homework, practice.	

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

3. Week	Pulsations in blue and red zones of instability strip. Causes for cessation of pulsation.	Oral lectures, homework, practice.	
4. Week	Relation between pulsation and opacity.	Oral lectures, homework, practice.	
5. Week	Obtain total internal energy of star.	Oral lectures, homework, practice.	
6. Week	Equilibrium in stars (dynamic equilibrium, thermal equilibrium and vibrational equilibrium)-I.	Oral lectures, homework, practice.	
7. Week	Equilibrium in stars (dynamic equilibrium, thermal equilibrium and vibrational equilibrium)-II.	Oral lectures, homework, practice.	
8. Week	Mid-term exam.	Written exam.	
9. Week	Lamb frequency, Brunt Väisälä frequency.	Oral lectures, homework, practice.	
10. Week	Homogeneous Model and Classification of Modes.	Oral lectures, homework, practice.	
11. Week	Helioseismology.	Oral lectures, homework, practice.	
12. Week	Investigation of interior of Sun by Forward and Inverse methods.	Oral lectures, homework, practice.	
13. Week	Determination of seismologic H-R diagram in pulsating stars like Sun.	Oral lectures, homework, practice.	
14. Week	Impact of rotation and metalicity to pulsation.	Oral lectures, homework, practice.	
15. Week	Physics of pulsation in Ap stars.	Oral lectures, homework, practice.	
16. Week	Final exam.	Written exam.	

RESOURCES

Recommended Sources
-Radial and Non-radial Pulsations as Probes of Stellar Physics", IAU Colloquium 185, Edited by Conny Aerts, Timothy R. Bedding and Jørgen Christensen-Dalsgaard, 2002, Astronomical Society of the Pacific.
-"Asteroseismology", Conny, Aerts, 2007-2008 academic year, Lectures notes. -Copyright (2003) George W. Collins, II, http://ads.harvard.edu/books/1989fsa..book/AbookC01-C08.pdf.
-"Tidal Evolution and Oscillations in binary Stars Third Granada Workshop on Stellar Structure", Edited by A. Claret, A. Gimenez and J.-P., Zahn, 2004, Astronomical Society of The Pacific Conference Series.

ASSESSMENT

Measurement and Evaluation Methods and Techniques		
Mid-term exam (40 percent), Final exam (60 percent).		
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
PY1	5	4	5	5
PY2	4	4	4	3
PY3	4	3	4	4
PY4	4	4	4	3
PY5	4	4	3	4
PY6	5	5	5	4
PY7	4	4	4	3
PY8	4	4	3	4
PY9	5	5	5	4
PY10	3	3	3	3
PY11	4	4	4	3
PY12	4	4	4	3
PY13	4	4	4	3
PY14	5	4	5	5
PY15	5	5	5	4

*DK = Course's Contrubution.

	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	36	36
Mid Term Exam Preparation	1	32	32
Further Study	14	1	14
Final Exam	1	3	3
Mid Term Exam 1	1	3	3
Laboratory	2	10	20
Preliminary Study	14	3	42

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