Fizik Bölümü / PHYSICS /

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
FZK-4018	Astrophphysics II	2.00	2.00	0.00	3.00	7.00

Course Detail

Course Language	:	Turkish
Qualification Degree	:	Bachelor
Course Type	:	Optional
Preconditions	:	Not
Objectives of the Course	:	An examination of the internal structure and evolution of the stars is aimed in this course.
Course Contents	:	This course provides the course of Astrophysics I. The topics of this course are as follows: Hydrostatic Equilibrium, Thermal Equilibrium, Electron Scattering and The Line Absorption Coefficients, Convective Instability, Theory of Convective Energy Transport, Energy Generation in Stars, Basic Stellar Structure Equations, Physical Interpretation of The Hayashi Line, Models For Main Sequence Stars, Evolution of Low Mass Stars, Evolution of Massive Stars, Observational Tests of Stellar Evolution:White Dwarfs and Neutron Stars.
Recommended or Required Reading	:	Erica Böhm Vitense, 1992, Introduction to Stellar Astrophysics (Volume 1,2,3), Cambridge, Cambridge University Press. Saul A. Teukolsky, Stuart L. Shapiro, 1983, Black holes, white dwarfs, and neutron stars: The Physics of Compact Stars, USA, John Wiley&Sons Inc. Hansen, Carl J., Kawaler, Steven D., Trimble, Virginia, 2004, Stellar interiors : physical principles, structure, and evolution (2nd ed.), New York, Springer.
Planned Learning Activities and Teaching Methods	:	Practice in course and homeworks.
Recommended Optional Programme Components	:	Repetition of Astrophysics I knowledge is helpful
Instructors	:	Assoc. Prof. Dr. Filiz Kahraman Aliçavuş
Instructor's Assistants	:	-
Presentation Of Course	:	Online due to pandemic

Course Outcomes

Upon the completion of this course a student :

1 Explain the hydrostatic equilibrium which occurs in the stellar interiors.

2 Discuss the consequences of the theorem explaining the Virial theorem.

3 Discuss the consequences of the equilibrium defining the thermal equilibrium in stars.

4 Write the Schwarzschild criterion for convective instability.

5 Explain the energy transport mechanism by convection in the stellar interiors.

6 Summarize the solar neutrino problem reading the different resources.

7 Explain each stage of evolution of low and massive stars.

Preconditions

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Weekly Contents

	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods
1.Week	*Hydrostatic Equilibrium	*Hydrostatic Equilibrium			
2.Week	*Thermal Equilibrium	*Thermal Equilibrium			
3.Week	*Electron Scattering and The Line Absorption Coefficients	*Electron Scattering and The Line Absorption Coefficients			
4.Week	*Convective Instability	*Convective Instability			
5.Week	*Theory of Convective Energy Transport	*Theory of Convective Energy Transport			
6.Week	*Theory of Convective Energy Transport	*Theory of Convective Energy Transport			
7.Week	*Energy Generation in Stars	*Energy Generation in Stars			
8.Week	*Midterm Exam				
9.Week	*Basic Stellar Structure Equations	*Basic Stellar Structure Equations			
10.Week	*Physical Interpretation of The Hayashi Line	*Physical Interpretation of The Hayashi Line			
11.Week	*Models For Main Sequence Stars	*Models For Main Sequence Stars			
12.Week	*Evolution of Low Mass Stars	*Evolution of Low Mass Stars			
13.Week	*Evolution of Massive Stars	*Evolution of Massive Stars			
14.Week	*Observational Tests of Stellar Evolution:White Dwarfs and Neutron Stars	*Observational Tests of Stellar Evolution:White Dwarfs and Neutron Stars			

Assesment Methods %

1 Final : 60.000

2 Vize : 40.000

ECTS Workload

Activities	Count	Time(Hour)	Sum of Workload
Vize	1	2.00	2.00
Attending lectures	14	4.00	56.00
Application / Practice	2	4.00	8.00
Individual study before lecture	7	11.00	77.00
Preparation for midterm	1	25.00	25.00
Preparation for final	1	25.00	25.00
Final Exam	1	2.00	2.00
		Total :	195.00
		Sum of Workload / 30 (Hour) :	6
		ECTS :	7.00

Program And OutcomeRelation

	P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11	P.O. 12	P.O. 13	P.O. 14	P.O. 15	P.O. 16	P.O. 17	P.O. 18	P.O. 19	P.O. 20	P.O. 21	P.O. 22	P.O. 23	P.O. 24
L.O. 1	3	4	4	3	3	4	3	4	3	4	2	3	0	0	0	0	0	0	0	0	0	0	0	0
L.O. 2	3	4	4	3	3	4	3	4	3	4	2	3	0	0	0	0	0	0	0	0	0	0	0	0
L.O. 3	3	4	4	3	3	4	3	4	3	4	2	3	0	0	0	0	0	0	0	0	0	0	0	0
L.O. 4	3	4	4	3	3	4	3	4	3	4	2	3	0	0	0	0	0	0	0	0	0	0	0	0
L.O. 5	3	4	4	3	3	4	3	3	3	4	2	3	0	0	0	0	0	0	0	0	0	0	0	0
L.O. 6	3	4	4	3	3	4	3	4	3	4	2	3	0	0	0	0	0	0	0	0	0	0	0	0
L.O. 7	3	4	4	3	3	4	3	4	3	4	2	3	0	0	0	0	0	0	0	0	0	0	0	0

Ders/Program Çıktıları İlişkisi

P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11	P.O. 12	P.O. 13	P.O. 14	P.O. 15	P.O. 16	P.O. 17	P.O. 18	P.O. 19	P.O. 20	P.O. 21	P.O. 22	P.O. 23	P.O. 24	P.O. 2
3	4	4	3	3	4	4	3	4	3	4	2	3	0	0	0	0	0	0	0	0	0	0	0	0