Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Astrophysics II	FZK462	8. Semester	2 + 2	3.0	8.0

Prerequisites	None

Language of Instruction	Turkish
Course Level	Bacheclor's Degree (First Cycle)
Course Type	Elective
Mode of delivery	Face to face
Course Coordinator	Assist. Prof. Dr. Burcu ÖZKARDEŞ
Instructors	Assist. Prof. Dr. Burcu ÖZKARDEŞ
Assistants	
Course Objectives	An examination of the internal structure and evolution of the stars is aimed in this course.
Course Content	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.
Course Learning Outcomes	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.

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Hydrostatic Equilibrium	Lecturing	
2. Week	Thermal Equilibrium	Lecturing	
3. Week	Electron Scattering and The Line Absorption Coefficients	Lecturing	
4. Week	Convective Instability	Lecturing	

Quick Access

Physics
- 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

5. Week	Theory of Convective Energy Transport	Lecturing	
6. Week	Theory of Convective Energy Transport	Lecturing	
7. Week	Energy Generation in Stars	Lecturing, Application	
8. Week	Midterm Exam	Written Exam	
9. Week	Basic Stellar Structure Equations	Lecturing	
10. Week	Physical Interpretation of The Hayashi Line	Lecturing	
11. Week	Models For Main Sequence Stars	Lecturing	
12. Week	Evolution of Low Mass Stars	Lecturing	
13. Week	Evolution of Massive Stars	Lecturing	
14. Week	Observational Tests of Stellar Evolution:White Dwarfs and Neutron Stars	Lecturing	
15. Week	Review of The Semester	Revision	
16. Week	Final Exam	Written Exam	

RESOURCES

Recommended Sources
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.

ASSESSMENT

Measurement and Evaluation Methods and Techniques
Midterm Exam (40%), Final Exam (60%)

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	DK6	DK7
PY1	3	3	3	3	3	3	3	3
PY2	4	4	4	4	4	4	4	4
PY3	4	4	4	4	4	4	4	4
PY4	3	3	3	3	3	3	3	3
PY5	3	3	3	3	3	3	3	3
PY6	4	4	4	4	4	4	4	4
PY7	3	3	3	3	3	3	3	3
PY8	3	4	4	3	3	4	3	3
PY9	3	3	3	3	3	3	3	3
PY10	3	3	3	3	3	3	3	3

PY11	2	2	2	2	2	2	2	2
PY12	2	2	2	2	2	2	2	2
PY13	3	3	3	3	3	3	3	3
PY14	3	3	3	3	3	3	3	3
PY15	3	3	3	3	3	3	3	3

*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	4	56
Final Exam Preparation	1	25	25
Mid Term Exam Preparation	1	25	25
Further Study	7	11	77
Final Exam	1	2	2
Mid Term Exam 1	1	2	2
Application/Practice	2	4	8
		Total Workload	195
		Total Workload / 25.5 (s)	7.65
		ECTS Credit of the Course	8