



Çanakkale Onsekiz Mart University

Education Information System

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Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
High-Energy Astrophysics I	FZ5023		3 + 0	3.0	7.5

Prerequisites	None
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Language of Instruction	English
Course Level	Second Cycle
Course Type	Elective
Mode of delivery	Face to face
Course Coordinator	Assist. Prof. Dr. Gülnur GÜN
Instructors	Assist. Prof. Dr. Gülnur GÜN
Assistants	
Course Objectives	The aim of this course is to give students the knowledge about the Cosmic ray data, detection of relativistic particles, supernovae, pulsars, quasars, and X-ray sources; particle and photon interaction of astrophysical significance.
Course Content	The high energy particles and their properties, The interactions and detections of the high energy particles, The cosmic rays, The relativistic particles, The interactions and detections of the high relativistic particles, Supernovae, Pulsars, Quasars , X-ray sources, The interactions between particles and photons, The cosmological effects of the interactions between particles and photons.
Course Learning Outcomes	1) Explain what the high energy particles are. 2) Interpret cosmic rays, relativistic particles and the interaction between them. 3) Explain Supernova ,Pulsars, Quasars and X- ray sources. 4) Define what the particle is. 5) Interpret the interactions between particles and photons in the universe.

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	The high energy particles and their properties	(Face to face lecture and the relevant part of the course materials is studied by the students)Lecture	
2. Week	The interactions and detections of the high energy particles	(Face to face lecture and the relevant part of the	

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Physics (Master)

- 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

		course materials is studied by the students)Lecture	
3. Week	The cosmic rays – I	(Face to face lecture and the relevant part of the course materials is studied by the students)Lecture	
4. Week	The cosmic rays - II	(Face to face lecture and the relevant part of the course materials is studied by the students)Lecture	
5. Week	The relativistic particles	(Face to face lecture and the relevant part of the course materials is studied by the students)Lecture	
6. Week	The interactions and detections of the high relativistic particles	(Face to face lecture and the relevant part of the course materials is studied by the students)Lecture	
7. Week	Supernovae	(Face to face lecture and the relevant part of the course materials is studied by the students)Lecture	
8. Week	Midterm exam	(Written or test exam) Lecture	
9. Week	Pulsars	(Face to face lecture and the relevant part of the course materials is studied by the students)Lecture	
10. Week	Quasars	(Face to face lecture and the relevant part of the course materials is studied by the students)Lecture	
11. Week	X-ray sources- I	(Face to face lecture and the relevant part of the course materials is studied by the students)Lecture	
12. Week	X-ray sources- II	(Face to face lecture and the relevant part of the course materials is studied by the students)Lecture	
13. Week	The interactions between particles and photons-I	(Face to face lecture and the relevant part of the course materials is studied by the students)Lecture	
14. Week	The interactions between particles and photons-II	(Face to face lecture and the relevant part of the course materials is studied by the	

		students)Lecture	
15. Week	The cosmological effects of the interactions between particles and photons.	(Face to face lecture and the relevant part of the course materials is studied by the students)Lecture	
16. Week	Final exam	(Written or test exam) Lecture	

RESOURCES

Recommended Sources
Longair, M.S.:1992, High Energy Astrophysics, Second Edition, Volume 1, Cambridge University Press.
Weekes, T.C. : 1980, High Energy Astrophysics, Chapman and Hall Limited.
Editors : Lehy, D.A., Hicks, R.B., and Venkatesan, D. : 1994, Proceedings of the XXIII International Cosmic Ray Conference, World Scientific Publishing Co. Pte.Ltd.
Cordova, F.A. : 1988, Multiwavelength Astrophysics, Cambridge University Press.

ASSESSMENT

Measurement and Evaluation Methods and Techniques
Midterm exam +Assignment +Presentation (40 %), Final exam (60 %).

COURSE CATEGORY

Course Category	Percentage
Area of pecialization Courses	% 100

CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES

Programme Outcomes	Contribution Level	DK1	DK2	DK3	DK4	DK5
PY1	5	5	5	5	5	5
PY2	5	5	5	5	5	5
PY3	4	4	4	4	4	4
PY4	5	5	5	5	5	5
PY5	5	5	5	5	5	5
PY6	5	5	5	5	5	5
PY7	3	3	3	3	3	3
PY8	4	4	4	4	4	4
PY9	5	5	5	5	5	5
PY10	5	5	5	5	5	5
PY11	3	3	3	3	3	3
PY12	5	5	5	5	5	5
PY13	5	5	5	5	5	5
PY14	5	5	5	5	5	5
PY15	4	4	4	4	4	4

*DK = Course's Contribution.

	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)
Further Study	14	3	42
Class Hours (14 weeks)	14	3	42
Final Exam Preparation	1	31.25	31.25
Mid Term Exam Preparation	1	18	18
Final Exam	1	2	2
Preliminary Study	14	1	14
Presentation/Seminar	14	1	14
Assignment 1	14	2	28
Total Workload			191.25
Total Workload / 25.5 (s)			7.50
ECTS Credit of the Course			8