

[DEGREE PROGRAMMES](#)[BOLOGNA](#)[THE INSTITUTION](#)[INFO FOR STUDENTS](#)You are here : [Home](#) [Master's Degree& Doctorate Degree](#) [Physics \(PhD\)](#) [X-Ray Astronomy II](#) **Course Information**

Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
X-Ray Astronomy II	FZ-6028		3 + 0	3.0	7.5

Prerequisites	None
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Language of Instruction	English
Course Level	Third 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 and skills about the high energy particles especially about X-rays, the X rays detector and satellites, The mechanisms of x ray analysis and the theoretical X ray emission mechanisms.
Course Content	The high energy particles and their properties, , The X-rays, X-ray sources, X-ray detectors, X-ray satellites, The methods of X-ray analysis, The theoretical X-ray emission mechanisms
Course Learning Outcomes	1) Define the high energy particles, their properties and interactions. 2) Define the X-rays and its properties. 3) Explain the X-ray satellites and their detectors 4) Analyse X-ray data basically. 5) Compare the theoretical X-ray radiation mechanisms and the results of the data analysis.

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

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)	
2. Week	The interactions and detections of the high energy particles	(Face to face lecture and the relevant part of the course materials is	

		studied by the students)	
3. Week	The X-rays-I	(Face to face lecture and the relevant part of the course materials is studied by the students)	
4. Week	The X-rays-II	(Face to face lecture and the relevant part of the course materials is studied by the students)	
5. Week	X-ray sources- I	(Face to face lecture and the relevant part of the course materials is studied by the students)	
6. Week	X-ray sources- II	(Face to face lecture and the relevant part of the course materials is studied by the students)	
7. Week	X-ray detectors- I	(Face to face lecture and the relevant part of the course materials is studied by the students)	
8. Week	Midterm exam	Written or test exam	
9. Week	X-ray detectors- II	(Face to face lecture and the relevant part of the course materials is studied by the students)	
10. Week	X-ray satellites- I	(Face to face lecture and the relevant part of the course materials is studied by the students)	
11. Week	X-ray satellites- II	(Face to face lecture and the relevant part of the course materials is studied by the students)	
12. Week	The methods of X-ray analysis-I	(Face to face lecture and the relevant part of the course materials is studied by the students)	
13. Week	The methods of X-ray analysis-II	(Face to face lecture and the relevant part of the course materials is studied by the students)	
14. Week	The theoretical X-ray emission mechanisms-I	(Face to face lecture and the relevant part of the course materials is studied by the students)	

15. Week	The theoretical X-ray emission mechanisms-II	(Face to face lecture and the relevant part of the course materials is studied by the students)	
16. Week	Final exam	Written or test exam	

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 : Trümper, J.E., Hasinger, G.,2008, The Universe in X Rays, Springer Astronomy and Astrophysics Library
Web pages of several X-ray satellites.
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
Mid-term exam (40 %) Final exam (60 %)

COURSE CATEGORY

Course Category	Percentage
Area of?Specialization 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	3	3	3	3	3	3
PY3	5	5	5	5	5	5
PY4	3	3	3	3	3	3
PY5	3	3	3	3	3	3
PY6	5	5	5	5	5	5
PY7	5	5	5	5	5	5
PY8	5	5	5	5	5	5
PY9	3	3	3	3	3	3
PY10	5	5	5	5	5	5
PY11	5	5	5	5	5	5
PY12	5	5	5	5	5	5
PY13	5	5	5	5	5	5
PY14	5	5	5	5	5	5
PY15	5	5	5	5	5	5

*DK = Course's Contribution.

	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	25	25
Mid Term Exam Preparation	1	22	22
Final Exam	1	2	2
Mid Term Exam 1	1	1	1
Further Study	14	5.1	71.4
Preliminary Study	14	2	28
Total Workload			191.4
Total Workload / 25.5 (s)			7.51
ECTS Credit of the Course			8