



Form: Course Syllabus	Form Number	EXC-01-02-02A
	Issue Number and Date	2/3/24/2022/2963 05/12/2022
	Number and Date of Revision or Modification	
	Deans Council Approval Decision Number	2/3/24/2023
	The Date of the Deans Council Approval Decision	23/01/2023
	Number of Pages	06
1.	Course Title	Astrophysics
2.	Course Number	302464
3.	Credit Hours (Theory, Practical)	3
	Contact Hours (Theory, Practical)	3
4.	Prerequisites/ Corequisites	0302351 and 0342332
5.	Program Title	BSc physics
6.	Program Code	302
7.	School/ Center	Science
8.	Department	Physics
9.	Course Level	Fourth year
10.	Year of Study and Semester (s)	---
11.	Other Department(s) Involved in Teaching the Course	BSc
12.	Main Learning Language	---



13.	Learning Types	<input type="checkbox"/> Face to face learning <input checked="" type="checkbox"/> Blended <input type="checkbox"/> Fully online
14.	Online Platforms(s)	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams
15.	Issuing Date	2 Aug 2024
16.	Revision Date	2 Aug 2024

17. Course Coordinator:

Name: Ala'a Azzam
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18. Other Instructors:

Name: Ala'a Azzam
Phone number:22023 Email:alaa.azzam@ju.edu.jo

19. Course Description:

heat transfer in stars and ;matter and radiation in stars ;Basic concepts of astrophysics
astrophysics ;stellar evolution and the cosmology of the universe ;stellar structure ;nucleosynthesis
.galaxies and the universe ;Black holes ;neutron stars ;and general relativity



20. Program Intended Learning Outcomes: (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

1. Master professionally a broad set of knowledge concerning the fundamentals in the basic areas of physics: Quantum Mechanics, Classical Mechanics, Electrostatics and Magnetism, Thermal Physics, Optics, Theory of Special Relativity, Mathematical Physics, Electronics.
2. Apply knowledge of mathematics and fundamental concepts in the basic areas of physics to identify and solve physics related problems.
3. Utilize computers and available software in both data collections and data analysis.
4. Utilize standard laboratory equipment, modern instrumentation, and classical techniques to design and conduct experiments as well as to analyze and interpret data.
5. Develop a recognition of the need and ability to engage in life-long learning.
6. Demonstrate ability to use techniques, skills, and modern scientific tools necessary for professional practice.
7. Communicate clearly and effectively in both written and oral forms.
8. Apply proficiently team-work skills and employ team-based learning strategies.
9. Apply professional and ethical responsibility to society.

21. Course Intended Learning Outcomes: (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

1. understand the major and radiation in stars
2. understand the stellar evolution and stellar structure
3. understand the heat transfer in stars and nucleosynthesis
4. understand the astrophysics and general relativity
5. understand the cosmology of the universe; galaxies and the universe
6. understand the neutron stars; Black holes

Course ILOs	The learning levels to be achieved					
	Remembering	Understanding	Applying	Analysing	evaluaAng	CreaAng
1		X				
2		X				



3		X				
4		X				
5		X				
6		X				

22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:

Program ILOs Course ILOs	ILO (1)	ILO (2)	ILO (3)	ILO (4)	ILO (5)
1	X				
2	X				
3		X			
4		X			
5	X				
6	X				

23. Topic Outline and Schedule:

Week	Lecture	Topic	ILO/s Linked to the Topic	Learning Types (Face to Face/ Blended/ Fully Online)	Platform Used	Synchro nous / Asynchr onous Lecturi ng	Evaluati on Methods	Lea rni ng Res our ces



1	1.1	Astronomical Distances	1	Blended	Microsoft Teams	Synchronous	Activity	The book
	1.2	Stellar Luminosity	2	Blended	Microsoft Teams	Synchronous	Activity	The book
	1.3	Surface Temperature from a Star's Color	3	Blended	Moodle	Synchronous	Activity	The book
	1.4	Stellar Radius from Luminosity and Temperature	3	Blended	Microsoft Teams	Synchronous	Activity	The book
	1.5	Composition and Ionization from Stellar Spectra	4	Blended	Microsoft Teams	Synchronous	Quiz	The book
	1.6	surface Gravity and Escape/Orbital Speed	5	Blended	Moodle	Synchronous	Activity	The book
2	2.1	Hydrostatic Balance between Pressure and Gravity	4	Blended	Microsoft Teams	Synchronous	Activity	The book
	2.2	Transport of Radiation from Interior to Surface	4	Blended	Microsoft Teams	Asynchronous	Activity	The book
	2.3	Structure of Radiative versus Convective Stellar Envelopes	1	Blended	Moodle	Synchronous	Quiz	The book



	2.4	Hydrogen Fusion and the Mass Range of Stars	2	Blended	Microsoft Teams	Synchronous	Activity	The book
	2.5	Post-Main-Sequence Evolution: Low-Mass Stars	3	Blended	Microsoft Teams	Asynchronous	Activity	The book
	2.6	Post-Main-Sequence Evolution: High-Mass Stars	4	Blended	Moodle	Synchronous	Activity	The book
4	4.1	Our Milky Way Galaxy	5	Blended	Moodle	Synchronous	Activity	The book
	4.2	External Galaxies	6	Blended	Moodle	Synchronous	Activity	The book
	4.3	Active Galactic Nuclei and Quasars	6	Blended	Moodle	Synchronous	Activity	The book
	4.4	Large-Scale Structure and Galaxy Formation and Evolution	6	Blended	Microsoft Teams	Synchronous	Activity	The book
5	5.1	Newtonian Dynamical Model of Universe Expansion	5	Blended	Microsoft Teams	Asynchronous	Quiz	The book



5.2	Accelerating Universe with a Cosmological Constant	6	Blended	Microsoft Teams	Synchronous	Activity	The book
5.3	The Hot Big Bang	6	Blended	Moodle	Synchronous	Activity	The book
5.4	Eras in the Evolution of the Universe	6	Blended	Microsoft Teams	Asynchronous	Quiz	The book

24. Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	ILO/s Linked to the Evaluation activity	Period (Week)	Platform
First Exam	20	1.1 - 2.3	1,2,3,4	6	Class
Second Exam	30	2.4-4.4	3,4,5,6	10	Class
Final Exam	50	1.1-5.4	1,2,3,4,5,6	15	Class

25. Course Requirements:

students should have internet connection

26. Course Policies:



- A- Attendance policies: according to the university policies
- B- Absences from exams and submitting assignments on time: the student should contact me immediately
- C- Health and safety procedures: No
- D- Honesty policy regarding cheating, plagiarism, misbehavior:
- E- Grading policy: according to this syllabus
- F- Available university services that support achievement in the course: the library and the internet

27. References:

- A- Required book: Owocki, S. (2021). *Fundamentals of Astrophysics*. Cambridge: Cambridge University Press.
- B- Recommended books, materials, and media:

28. Additional information:

Name of the Instructor or the Course Coordinator:	Signature:	Date:
.....Dr Ala'a Azzam.....	2 Aug 2024...
Name of the Head of Quality Assurance CommiLee/ Department	Signature:	Date:
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Name of the Head of Department	Signature:	Date:
.....
Name of the Head of Quality Assurance CommiLee/ School or Center	Signature:	Date:
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الجامعة الاردنية



The University of Jordan

Name of the Dean or the Director

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Signature:

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Date:

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