هيئة تقويم التعليم
Education Evaluation Commission
المركز الوطني للتقويم والاعتماد الأكاديمي
National Center for Academic Accreditation and Evaluation

COURSE SPECIFICATIONS
(CS)

Astrophysics 2

PHYS 412

June 2018

Course Specifications

Institution: **King Saud University**	Date: **December 2017**
College/Department : **College of Science / Physics and Astronomy Department**	

A. Course Identification and General Information

1. Course title and code:	**Astrophysics 2, Phys 412**
2. Credit hours:	**2(2+0+0)**
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **Elective**	
4. Name of faculty member responsible for the course **Dr. Ayman S. Kordi; Dr. Abouazza Elmhamdi**	
5. Level/year at which this course is offered:	**8th / 4th year**
6. Pre-requisites for this course (if any) **Astr 102**	
7. Co-requisites for this course (if any) None	
8. Location if not on main campus	

9. Mode of Instruction (mark all that apply)

a. traditional classroom	Yes	What percentage?	
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

Classroom Lectures + Practice through Telescopes sessions

B Objectives

1. What is the main purpose for this course? - Advance in some fundamentals in Astronomy and Astrophysics at large scale. - Get familiarize with some basic concepts of Interstellar matter (ISM) and Galaxies - Applying physical laws and principles to interpret the main properties Galaxies and ISM. - Using Astrophysical concepts and related analysis approaches to improve the generic skills such as: knowledge – interpersonal – communication – problem solving – IT.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) 1- Emphasizing the importance of studying the nature and characteristics of ISM, star formation, as well as Galaxies focusing on the physics behind. 2- Improving the practice part of the course: * possible training: observations using the Astronomy-Unit Telescopes * adopting more computer-based tasks to enhance the students generic and IT skills: (Stellar Software: tracks evolutions, HR, Spectra, Photometry)

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: **Interstellar matter (ISM): distribution and structure- Physics of ISM – HI and HII regions – Interstellar clouds – Star formation – Chemical properties and evolution of Galaxies– Planetary nebulae.**

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
ISM : introduction- distribution – structure and the main physics	2	4
HI and HII regions, Interstellar clouds	3	6
Star formation	4	8

Physics and chemistry of Planetary nebulae	3	6
Galaxies: types-physics	3	6

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	30					30
Credit	2					2

3. Additional private study/learning hours expected for students per week.

3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	* learn the basics of ISM & Galactic Astrophysics * introducing Star formation theories * Planetary nebulae and Galaxies	1- Demonstrating the basic principles through lectures and observations 2- Discussing phenomena by illustrating pictures, diagrams and models	1- Exams a) quizzes b) two mid term exams) c) final exam 2- Reports 3- In-class discussions

		3- Lecturing method: a) Blackboard b) e-learning	
1.2			
2.0	**Cognitive Skills**		
2.1	* Advanced knowledge in Astrophysics-at large scale * Explain Star formation and ISM characteristics in terms of physical concepts and laws. * How Astronomical knowledge are used to improve our technologies *The interactions between Astrophysics and the other fields of Science.	1- Home work assignments for each studied topic 2- Preparing in advance main outlines for a topic 3- Discussing ISM and Galaxies and the related theories	1- Asking about astrophysical laws and/or observations previously taught 2- Writing reports on selected parts of the course 3- Discussions on how to analyze/interpret some phenomena and observations (related to ISM and Galactic characteristics) 4- Exams, short quizzes
3.0	**Interpersonal Skills & Responsibility**		
3.1	* Work independently and as part of a team. * Manage resources and time - take up responsibility * Communicate results of the work to others	1- Conducting group discussion sections, solving problems and writing reports in groups. 2- Learn how to summarize lectures, collect materials, and how to cover missed lectures. 3- Develop interest in Astrophysics Science through : attending observations- Astro. Unit. 3- Conduct self-search in the internet and use the library (tasks of duties) 4- Encourage the student to attend lectures regularly possibly by giving bonus marks for attendance 5- Encourage students to improve their English language.	1- Checking reports given as tasks for different skills 2- In-class discussions and interactions. 3- Assessment of the required reports 4- Grading homework assignments 5- Exams
4.0	**Communication, Information Technology, Numerical**		

4.1	* Communication with others: the lecturer – students - community * IT through: searching for information in the internet – computer skills - use of e-libraries * Numerical skills through: computation – data analysis – feeling physical reality of results. * Report writing	1- Encourage communication with the other students and the instructor to overcome some learning difficulties. 2- Encourage students to transfer their knowledge in Astronomy/Astrophysics to the community 3- Asking students to prepare reports by searching the internet or using the library independently or through groups. 4- Astronomical data and observations interpretations focusing on some real results and their physical meanings and impact on our life (our local Galaxy properties).	1- Evaluating tasks and written reports for the different aims 2- Checking results of computations and analysis, and the students ability to correctly interpret them. 3- Exams
5.0	**Psychomotor** **Not Applicable**		

5. Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes (Use Program LO Code #s provided in the Program Specifications)**								
	1.1	**1.2**		**2.1**		**3.2**		**4.1**	
1.1									
2.1									

6. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Class activities: presentations, essays, reports, posters + attendance	Weekly	20%
2	Mid-exam I	Around 6	

			20%
3	Mid-exam II	Around 12	20%
4	Major Final-exam	Around 16	40%
5			
6			
8			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Office hours: 3 hours per week
Contact via email (not restricted)

E Learning Resources

1. List Required Textbooks

- An introduction to modern Astrophysics
Authors: Bradley Carroll and Dale Ostlie, Addison Wesley
Publisher: Pearson; 2 edition (July 28, 2006)

- Introduction to Astronomy (in Arabic) –Galaxies Part
Authors: M. Nawawy, A. Kordi and H. Al-Trabulsy
King Saud University Publisher, 2011

2. List Essential References Materials (Journals, Reports, etc.)

- Astrophysics 2: ISM and Galaxies
Authors: Richard L. Bowers, Terry Deeming
Publisher: Jones and Bartlett Publishers, 1984
Digitized: 8Feb. 2010

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

a- Astronomy Today, eds. E. Chaisson and S McMillan,
Publisher: Pearson; 8 edition (17 Sep 2014)
b- Astronomy: The evolving Universe, M Zeilik, Jhon Wiley and sons, Inc.

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc. Astrophysics-ISM&Galaxies web sites of interest, provided by the instructor
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. Multi media materials accompanying the text **books and the relevant websites (provided by the instructor)**

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • Lecture room with max 25 students seats • Observatory (telescopes in the Astro. Unit) • Library
2. Computing resources (AV, data show, Smart Board, software, etc.) • Computer room containing at least 15 computer systems. • Individual scientific calculators.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) • Equipment and illustration tools relevant to the course material, such as: - New Telescope with higher facilities - Data show projector , fixed in the classrooms

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Course evaluation by the students. • Students- faculty/instructor meetings. • Electronic Student evaluation organized by the University (KSU-Edugate system)
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department - Lecturers Committee to review the final results - Review of the final results by the department council and/or by a selected committee.
3 Processes for Improvement of Teaching

- Course and program reports evaluation
- Attending workshops, organized by KSU, dealing with teaching new approaches and strategies.
- Periodical departmental (and within the Astro Unit) revisions of the adopted methods of teaching
- Monitoring of teaching activities by senior faculty members

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- Providing samples of all kinds of assessment within the course portfolio
- Assigning faculty members, preferably having taught the same course, to grade same questions for various students.

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- The course material and learning outcomes should be periodically reviewed and hence changes can be taken and approved (by the departmental and higher councils).
- The head of department and faculty take the responsibility of implementing the proposed changes.
- Improvement: known Faculty in the field from other institutions might be invited to review the accuracy of the teaching and evaluation processes

Name of Instructor: _____

Signature: _____ Date Report Completed: _____

Name of Field Experience Teaching Staff _____

Program Coordinator:_____

Signature: _____ Date Received: _____