Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications (CS)

Modern Physics

Course Specifications

Institution: Dammam University Date: March 12, 2014.

College/Department : Sciences College of Dammam/ Physics Department

A. Course Identification and General Information

1. Course title and code: Modern Physics (PHYS 204)
2. Credit hours:4Cr. Hrs
3. Program(s) in which the course is offered: (Mastery in physics)
4. Name of faculty member responsible for the course A specific team from the Physics Department
5. Level/year at which this course is offered: Master
6. Pre-requisites for this course (if any) Solid state physics and thermodynamics laws
7. Co-requisites for this course (if any)
8. Location if not on main campus Sciences College of Dammam

9. Mode of Instruction (mark all that apply)

a. Traditional classroom What percentage?
100٪

b. Blended (traditional and online) What percentage? c. E-learning What percentage? d. Correspondence What percentage? f. Other What percentage?
Comments:.

B Objectives

1. What is the main purpose for this course?

This course describes the theory of relativity, essentially as it was formulated by Einstein and presents some physical phenomena that appear in temporal succession who have made an impact in the advancement of physics. Whose objectives were to reconcile the kinematics as we saw in the introduction to this course, the Galilean relativity is not directly compatible with electromagnetism as it was formulated by Maxwell.

The first step is to understand the inconsistencies between electromagnetism and classical kinematics, and rebuild a completely new kinematics, which leads to start by a few brief reminders Galilean or Newtonian kinematics and show its shortcomings and corrected them by the Lorentz transformations and after connect by explaining to students some physical phenomena such as the photoelectric effect and the Compton effect and lead them to know the property of duality wave-particle and finally end up by teaching them the atomic model and an introduction to quantum theory.

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)

Relativity theory - particle nature of waves - wave nature of particles - atomic structure and
atomic models - principles of quantum mechanics - Introduction to quantum theory.

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

Course Description:
1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Relativity theory	4	12
Particle nature of waves	2	6
Wave nature of particles	2	6
Atomic structure and atomic models	3	9
Principles of quantum mechanics	1	3
Introduction to quantum theory.	1	3

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	39	------	--------	----	-----	39
Credit						

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

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	General physics 1 and 2.	Explanations of phenomena by experimental examples treated or published and introduction the mathematical supports that are in relationship.	By direct discussion with students and some class tests

1.2	To use mathematical formulation to describe the physical principle or phenomena	Tutorials Revisit concepts Discussions	Ask the student to clear forecasts of some mathematical principle
1.3	Understanding the physics phenomena mentioned in the text.	Discussing phenomena with illustrating pictures and diagrams	Exams**:** -Quizzes -Short exams (mid term exams) -Long exams (final) -Oral exams
1.4	Improving logical thinking.	Lecturing method: -Blackboard -Power point	Discussions with the students.

		e-learning	
2.0	**Cognitive Skills**		
2.1	How to use physical laws and principls to understand the subject	Preparing main outlines for teaching	Midterm's exam. Exams, short quizzes
2.2	How to simplify problems and analyze phenomena	Define duties for each chapter	Asking about physical laws previously taught
2.3	Analyze and explain natural phenomena	Homework assignments	Writing reports on selected parts of the course.
2.4	Represent the problems mathematically	Encourage the student to look for the information in different references.	Discussions of how to simplify or analyze some phenomena
3.0	**Interpersonal Skills & Responsibility**		
3.1	Work independently	Learn how to search the internet and use the library.	Quizzes on the previous lecture.
3.2	The students learn independently and take up responsibility	Learn how to cover missed lectures	Checking report on internet use and trips.
3.3		Learn how to summarize lectures or to collect materials of the course.	Presenting the required research on time and the degree of the quality will show the sense of responsibility.
4.0	**Communication, Information Technology, Numerical**		
4.1	Problem solving.	Know the basic physical principles.	Their interaction with the lectures and discussions

4.2	Data analysis and interpretation.	Use the web for research.	The reports of different asked tasks.
4.3	Feeling mathematical reality of solving. problems	Discuss with the student	Homework, Problem solutions assignment and examshould focus on the understanding.
4.4		Exams to measure the mathematical skill	Comments on some resulting numbers.

5.0	**Psychomotor**		
5.1			
5.2			

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	Midterm 1	6th week	20
2	Midterm 2	10th week	20
3	Homeworks	Every week	10
4	Final exam	End of semester	50

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)

3
office hours per week

E Learning Resources

1. List Required Textbooks

1- Modern Physics by : K.Krane; Wiley John & Sons.

2- Special Relativity and Motion Faster Than Light; Moses Fayngold.

3- Modern Physics for Scientists and Engineers, 2nd Ed, Talyor, J. R., Prentice Hall.

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

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

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.)
2. Computing resources (AV, data show, Smart Board, software, etc.)
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Discussion directly with the teacher and by filling an anonymous form which is given by the administration.
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department Through forms which are filled by students without indexing their names.
3 Processes for Improvement of Teaching Follow the development and innovation of the teaching of this subject in the world.

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)

- The instructors of the course are checking together and put a unique process of evaluation
- Check marking of a sample of papers by others in the department.
- Feedback evaluation of teaching from independent organization.

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

1- The following points may help to get the course effect
   - Student evaluation
   - Course report
   - Program report
   - Program Self study
2- According to point 1 the plan of improvement should be given.
3- Contact the college to evaluate the course and the benefit it add to other courses.

Add some subject and cut off others depending on the new discoveries in Mathematics and basic science.

Dr Taher Ghrib