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

ATTACHMENT 5.

T6. COURSE SPECIFICATIONS (CS)

هيئة تقويم التعليم
Education Evaluation Commission

Course Specifications

Institution: **King Saud University**	Date: **07 January 2018**
College/Department : **Department of Physics and Astronomy**	

A. Course Identification and General Information

1. Course title and code: **Theory of solids** & code : **Phys 570**
2. Credit hours: (3+0+0)
3. Program(s) in which the course is offered. **Master in materials science**
(If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course: Dr. Amel Laref
5. Level/year at which this course is offered: Level two of master
6. Pre-requisites for this course (if any): **Phys 505**
7. Co-requisites for this course (if any):
8. Location if not on main campus:
9. Mode of Instruction (mark all that apply):

a. traditional classroom	x	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?

The student should get acquainted with band theory of solids, applied to metals, insulators, and semiconductors and all their physical properties will be studied. Then, the student will extend his/her knowledge about the transport theory, magnetic properties of solids, and superconductivity of materials. The student will learn the thermolelectric and photovoltaic effects in solids. The interaction of radiation with solids and elementary excitation will be acquainted by the student. In addition, he/she should learn the basic theory of solid state physics and the various physical properties of solids in related physical problems. The purpose of the course is to help the student getting valuable knowledge about the theory of solid state physics and this could lead the student to gain necessary theoretical background for performing the research project in solid state physics.

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)

Based on the knowledge and the background in theory of solids, the student can write reports and survey about given small research project related to solid state physics and its applications in material science technologies.

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

Course Description:

Band theory for metals, semiconductors and insulators - Properties of metals, semiconductors and insulators – Transport theory - Magnetic properties superconducting materials – Photovoltaic and thermoelectric effects – Interaction of radiation with solids – Elementary excitations.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Band Theory for Metals, Semiconductors, and Insulators	3	9
Properties of Metals, Semiconductors, and Insulators	3	9
Transport theory and magnetic properties of solids	3	9
Superconducting Materials	3	9
Photovoltaic and Thermoelectric Effects	2	6
Interaction of Radiation with Solids and Elementary Excitation	2	6

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

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	45	0	0	0		45
	Actual	45	0	9	0		58
Credit	Planed	3	0	0	0		3
	Actual	3	0	0	0		3

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

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	The student will gain knowledge about the basic theory of solids and their application to various physical problems. He/she should be able to grasp the idea of learning band theory of metals, insulators, and semiconductors, transport theory in solids, magnetic properties in solids and superconducting materials.	-From interactive class lectures. - By solving problems in the classes. -From the home assignments.	-To increase quizzes in the class. - To evaluate the home works, reports, presentations, midterm and final exams.
1.2	To understand and clarify the electronic, magnetic, thermoelectric, and transports properties of solids and dealing with their applications (in related physical problems).	-From interactive class lectures. - By solving problems in the classes. -From the home assignments.	-To increase quizzes in the class. - To evaluate the home works, reports, presentations, midterm and final exams.

2.0	**Cognitive Skills**		
2.1	The student will acquire ideas about basic theory of solids and their related physical properties with their potential applications in advanced technologies besides to different kinds of experimental techniques associated with them.	-From interactive class lectures. - By solving problems in the classes. -From the home assignments.	-To increase quizzes in the class. - To evaluate the home works, reports, presentations, midterm and final exams.
2.2	The student will develop skills to perform research bibliography and summarizing the existing research papers.	-Leaning steps for writing research paper.	-Oral presentation for research paper
3.0	**Interpersonal Skills & Responsibility**		
3.1	To acquire experience in writing reports and giving presentations.	-Develop thinking besides to team work during the classes. Home assignments and research reports	-Gaining experience by presenting the given research paper. -To discuss the related problem during classes
3.2	To perform the task by taking all necessary steps for achieving research projects, reports, and home assignments in the required time.	Home assignments, quizzes, reports and research papers.	-Gaining experience by presenting the given research paper. -To discuss the related problem during classes
4.0	**Communication, Information Technology, Numerical**		
4.1	To develop communication skills	-Develop thinking besides to team work during the classes. Home assignments and research reports	To provide small research project in the concerned course.
4.2	To gain experience by searching for research articles in recognized scholar webs.	Research reports and presentations	To provide small research project in the concerned course.
5.0	**Psychomotor**		
5.1			
5.2			

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Home assignment every two weeks	3rd, 6th, 9th, 12th	12 %
2	Midterm exam 1	7th	20%
3	Midterm exam 2	12th	20%
4	Term research paper and presentation	14th	8%
5	Final exam	16th	40%
6			

7			
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: Three hours per week.

E Learning Resources

1. List Required Textbooks - Introduction to solid state physics by Kittel. - Solid state physics, Aschroft.
2. List Essential References Materials (Journals, Reports, etc.) - Solid state physics by Gross. - Principles of the theory of solids by Ziman. - The Oxford Solid State Basics by Simon.
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. Material lab-studio, raswin, and rasmol softwares.

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. Technology 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
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
3. Processes for Improvement of Teaching
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)
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Name of Course Instructor: _____

Signature: _____ Date Specification Completed: _____

Program Coordinator: _____

Signature: _____ Date Received: _____