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

COURSE SPECIFICATIONS
(CS)

Solid State Physics -2

PHYS 463

June 2018

Course Specifications

Institution King Saud University	Date 10/12/2017
College of Science/Department of Physics and Astronomy	

A. Course Identification and General Information

1. Course title and code: **PHYS 463Solid State Physics -2**			
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): B Sc. Physics			
4. Name of faculty member responsible for the course:			
5. Level/year at which this course is offered:8th level, Elective			
6. Pre-requisites for this course (if any): PHYS 371			
7. Co-requisites for this course (if any): -			
8. Location if not on main campus: Main campus for Male, and Malaz for Female			
9. Mode of Instruction (mark all that apply)			
a. traditional classroom	X	What percentage?	80%
b. blended (traditional and online)	x	What percentage?	20%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	
Comments:			

B Objectives

1. What is the main purpose for gain this course?

- The student should be able to gain deep and detailed understanding of solid state physics including the electronic, electrical, and magnetic properties as well as the interaction of light with solids.
- The student should be able to appreciate the physical laws governing solids.
- The students should be able to predict the importance of solids in our life.

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)

- Introduce the strategy of the course at the beginning of the semester.
- Detailed Description of the physical laws and principles.
- Highlighting new applications of this science.
- Encourage the students to look up active web sites and references.
- Cooperate with different institution to find how they make use of the subject
- Frequently check for the latest progress in understanding solids.
- Full accessibility to course materials over the net to encourage student interactivity.

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

Course Description:

Fermi surfaces, Energy levels in one dimension, Energy bands, Energy band gap calculations, Electrical transport theory, Hall effect. Theory and applications of bands and carriers in semiconductors and devices. Magnetism in solids and superconductivity. Interaction of solids with radiations.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Fermi model and Fermi surfaces	2	4
Energy levels in one dimension	2	4
Energy bands, Energy gap calculations	2	4

Electrical transport theory, Hall effect and measurement applications	2	4
Theory and applications of bands and carriers in semiconductorsand devices	3	6
Magnetism in solids and superconductivity	2	4
Interaction of solids with radiations	2	4

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

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

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	Students are able to understand Solis State Physics, its theories, physical laws governing solids and interaction with light.	Lecture Smart Board Text Book.	Quizzes Short exams Long exams (final)

			MCQs)
1.2	Students are able to applyprinciples of evidence-based measurements and assessments of properties of solids to use in different devices.	Lecture Smart Board Class notes	Quizzes Short exams Long exams (final) MCQs.
1.3			
2.0	**Cognitive Skills**	1. Discussion 2. Problem solving during Lecture	Exams, short quizzes
2.1	Students are able to use physical laws and principles to solve related problems	1. Discussion 2. Problem solving during Lecture	Exams, short quizzes
2.2	Students are able to organize and evaluate breakdown problems and analyze phenomena	Lecture/Discussion	Discussion
2.3	Students are able to understand general research papers, lectures and scientific programs found on the internet	Lecture/Discussion	Discussion
3.0	**Interpersonal Skills & Responsibility**		
3.1	Students are able to Work independently and take up responsibility	Inverted class.	Home work/Discussion
3.2	Student are able to work in groups	Solving problems in groups during tutorial at the end of each chapter enhance educational skills	Discussion
4.0	**Communication, Information Technology, Numerical**		
4.1	students are able to use the internet for communication and homework /solving problems	Submission of home work and communicating by email	Discussion
4.2	Students are able to present written reports that make adequate use of various computer packages. The efficient use of networks in search for information	Report writing and presentation	Discussion
5.0	**Psychomotor**	NA	NA
5.1	NA	NA	NA
5.2			

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	5th week	20
2	Midterm 2	10th week	20

3	Project	7th,12th week	15
4	HW& Attendance	Every week	5
5	Final exam	End of semester	40

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): 4 office hours per week

E. Learning Resources

1. List Required Textbooks • *"Materials Science and Engineering, An Introduction"*, Fifth Edition, William D. Callister, Jr., John Wiley and Sons, Inc., 1999.
2. List Essential References Materials (Journals, Reports, etc.): • "An Introduction to Solid States Physics", C. Kittle, 6th Edition, John Wiley & Son Inc, (1986).
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) • "Solid State Physics, Ashcroft &Mermin", 1st Edition, Harcourt Asia Pte Ltd (1976). • "Introduction to condensed matter Physics.", Feng Duan&JinGuojun, (World Scientific, 2005).
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.: Wikipedia
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software. Scientific Mathematical packages

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 for 30 students • Library
2. Computing resources (AV, data show, Smart Board, software, etc.) • Computer room • Scientific Mathematical packages
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list): • Seminar room with multimedia and networking.

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching: • Office hours and e-mail correspondence. • Seminars.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department: • Verbal discussions
3. Processes for Improvement of Teaching: • Course report • Program report • Program self-study - Feedback on student learning - Reassessing, re-directing and corrective measures.
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): • Various instructor's comparison of notes. • Exam evaluation by colleagues. • Feedback evaluation by independent organization.

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement:
• The following points may help to get the course effectiveness
  ▪ Student evaluation
  ▪ Course report
  ▪ Program report
  ▪ Program self-study
• Accordingly, a plan of improvement should be given.
• Contact other colleges and ask colleagues to evaluate the course and the input of it into other courses.
• Keep abreast with the fast tempo of the nano-world.

Name of Instructor: _____

Signature:_____Date Report Completed:_____

Name of Teaching Staff _____

Program Coordinator:_____

Signature: _____ Date Received:_____