Course Specifications

Programme(s) on which the course is given : P., P.&las., P.&comp., P.&G., P.&Ch.

Major or Minor element of programmes : major - minor - major - major - major.

Department offering the programme : P., P., P.&Math., P.&G., P.&Ch.

.Department offering the course Physics

Academic year / Level 2

Date of specification approval: 2012

A- Basic Information

Title:	**Solid state physics (1)**	**Code: P211**
Credit Hours:	**3 h**	**Lecture: 3h**
Tutorial: 00	**Practicals:00**	**Total: 3h**

B- Professional Information

1 – Overall Aims of Course

at the end of the course, the student should be able to understand the variety of phenomena associated with the major forms of crystalline matter

student should know a well-established basic theory of solids

student should be able to understand the structure of crystalline solids i.e Bravais lattice, Miller's indices, atomic bonds …etc

2 – Intended Learning Outcomes of Course (ILOs)

a Knowledge and Understanding:

The student should have

a1- knowledge of the classification of Bravais lattices and crystal structure

a2- knowledge of basis of statistical mechanics and quantum theory which lie at the heart of solid state physics

a3- understanding of the different types of

molecular and atomic bonds

b Intellectual Skills

After completing the course the student will:

b1- be able to compare between different solids

b2- acquire sufficient background to understand the operation of modern solid state electronic devices

c Professional and Practical Skills

The student will

c1- be familiar with periodic arrays of atoms, fundamental types of lattices and electron levels in a periodic potential

c2- determine the crystal structure by X-ray diffraction

c3- be abile to interpret the physical properties according to the structure of the crystalline solids

d General and Transferable Skills

The student will be able to

d1- Use the gain knowledge to differentiate between the different crystal systems according of their morphology

d2- do reseach work for specific subject related to course materials

d3- use the different particle methods to determine the structure parameters for the solid materials

3- Contents

Topic	No. of hours	Lecture	Tutorial/Practical
Introduction to the solid state physics	3	1	
Phase transformation and symmetry	6	2	

elements			
Bravis lattices Miller's indices	**6**	**2**	
Crystal unit cell structure defects in crystalline materials	**9**	**3**	
Atomic and molecular bonds	**6**	**2**	
Crystal growing techniques	**6**	**2**	
X-ray diffraction by crystals	**6**	**2**	

4– Teaching asnd Learning Methods

4.1- Lecture

4.2 duscussion

4.3- reports assignment

5- Student Assessment Methods

5.1 written reports to assess collection of more information

5.2-periodic oral exams to assess the continuation study.

Assessment Schedule

Assessment 1 one report/3 weeks
Assessment 2 every three weeks
Assessment 3 mid term at the 8 th week
Assessment 4 final term at the week 14

Weighting of Assessments

Mid-Term Examination	**20 %**
Final-term Examination	**60 %**
Semester Work	**20 %**
Total	**100 %**

6- List of References

6.1- Course Notes

lectures notes .

6.2- Essential Books (Text Books)

"solid state physics" by W. Neil Ashcroft and N. David Mermin, (1976) by Halt Rinehart and Winston

"elements of solid state physics" by M. N. Rudden and J. Wilson,(1993), John Wiley & sons

Recommended Books

7- Facilities Required for Teaching and Learning

overhead projector and internet facilities

Course Coordinator: Dr/ Lobna Sharf El-Deen

Head of Department: Prof.Dr. Sana Maize

Date: / /