

University / Academy: Menoufiya University

College / Institute: Faculty of Electronic Engineering

Department: Physics and Engineering Mathematics

Course Specification

| ١- Course basic information : | | |
|--|--|--|
| Course Code: PM ١٠٣ | Course Title: Engineering physics (٣) | Academic year: ٢٠١٠-٢٠١٣ First Year Level (١) – Semester : ١ |
| Department requirement Faculty requirement University requirement | Teaching hours: Lecture <input type="text" value="٣"/> Tutorial <input type="text" value="١"/> Lab <input type="text" value="١"/> | |

| | |
|-----------------------------|--|
| ٢- Aim of the course | <ul style="list-style-type: none">• Introduce students the general principles of solid state physics. Solid state physics is the largest branch of condensed rigid matters of solids.• The bulk of solid state physics theory and research is focused on crystals, largely because the periodicity of atoms in crystalline materials often have electrical, optical and mechanical properties that can be exploited for engineering purposes.• The framework of most solid state physics theory is the Schrodinger wave equation and quantum mechanics. To solve the electron wavefunction problems in a periodic potential to develop the concept of energy bands in conductors, semiconductors and insulators. |
|-----------------------------|--|

٣- Intended Learning Outcomes:

| | |
|--|--|
| A- Knowledge and Understanding: | a١) Concepts and theories of mathematics and sciences appropriate to industrial electronics and control engineering. a٢) Methodologies of solving engineering problems, data collection and interpretation. a٣) Contemporary engineering topics. |
| B- Intellectual Skills | b١) Select appropriate solutions for engineering |

| | |
|--|---|
| | <p>problems based on analytical thinking.</p> <p>b^r) Think in a creative and innovative way in problem solving and design.</p> <p>b^y) Solve engineering problems, often on the basis of limited and possibly contradicting information.</p> |
| C- Professional Skills | c ¹) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. |
| D- General Skills | <p>d^r) Communicate effectively.</p> <p>d^y) Search for information and engage in life-long self learning discipline.</p> <p>d[^]) Acquire entrepreneurial skills.</p> <p>d[^]) Refer to relevant literatures.</p> |
| £- Course Contents | Crystal structure of solids - X-ray and its applications - optical properties of solids - quantum mechanics and Schrodinger equation - Band theory of solids-quantum theory of solids. |
| °- Teaching and Learning Methods | <ul style="list-style-type: none"> - Lectures - Tutorials - Labs and/or case studies - Research assignments |
| ˆ- Teaching and Learning Methods for disable students | NA |
| ∇- Student Assessment | |
| a- Assessment Methods | <ul style="list-style-type: none"> - Weekly sheet exercises at class room - Quizzes - Labs and/or case study for more demonstration. - Mid term, and final exams |
| b- Assessment Schedule | <ul style="list-style-type: none"> - Exercise sheet/ Lab assignment : Weekly - Quizz- 1 : Week <u>no</u> ^oth - Mid-Term exam: Week <u>no</u> [^]th - Quizz- 2 : Week <u>no</u> ¹th - Lab exam: Week <u>no</u> ^ˆth - Final – term examination: Week <u>no</u> ^{1 ∇th - 1 ^th} |
| c- Weighting of Assessment | <ul style="list-style-type: none"> - Class tutorial and quizzes : ° % - Mid-term examination: 1° % |

| | |
|--|---|
| | - Case study and/or practical exam: 10 % - Final – term examination: 70 % - Other types of assessment: 20 % Total 100 % |
| ^- List of text books and references: | |
| a- Course notes | There are lectures notes prepared in the form of a book authorized by the department |
| b- Text books | [1] Solid State Physics, Aschcroft N.W and Mermin N.D (1976) ISBN 0-08-039993-9 [2] Solid State Physics, Burns G (1980) ISBN 0-12-146070-3 |
| c- Recommended books | Solid State Physics, Hook J.R and Hall H.E (1991) Second Ed. ISBN 0-471-928004 |
| d- Periodicals, Web sitesetc | |

Course contents - ILOs Matrix

| Content Topics | Week | A- Knowledge & Understanding | B- Intellectual skills | C- Professional and practical skills | D- General and transferable skills |
|--|----------|------------------------------|------------------------|--------------------------------------|------------------------------------|
| crystal structure of solids | 1,2 | a1,a0 | bV | | |
| X-ray and its applications | 3,4 | a1,a0 | bV | c1 | |
| optical properties of solids | 5,6 | a1,a0 | bV | | d9 |
| quantum mechanics and Schrodinger equation | 5,6,7 | a1,a0 | bV | | d9 |
| Band theory of solids | 9,10 | a1,a0 | bV | c1 | d9 |
| quantum theory of solids | 11,12,13 | a1,a0 | bV | | d9 |
| | | | | | |

Course coordinator:
Prof. Dr. Mohamad Dawoud .

Head of Department:
Prof. Dr Magdy Kamel

Date: / /