Course specification

University/Academy: **Damanhour**

Faculty/Institute: Science

Department: Physics

1. course Data:		
Course code: PHY (406)	Course title: Superconductivity and special course	Academic year/level: 2010-2011 4th year (second term)
Specialization: Special physics	No. of instructional units: lecture 4hrs/ week tutorial 1hrs/ week practical 3hrs/ week	

2. course Aim	• The course introduces the fundamentals of superconductors and its applications.
3. Intended learning outcome	
a) Knowledge and understanding	**A1**: Define the superconductivity phenomena. **A2**: Explain the fundamentals of BCS theory of superconductivity**.** **A3**: Recognize the Meissner effect and isotop effect.
b) Intellectual skills	B1: Discuss the properties of superconductors. B2: Show the difference between superconductor and normal metals.

c) Professional skills	C1: Dissect the properties of superconductors. C2: prepare the difference between laser type 1 and type 2 superconductors. C3: Examine the physical knowledge to analyze a suitable technique to solve problems. C4: Examine some physical problems helping in understanding the course parts.
d) General skills	D1: Use of technology tools like the internet/electronic resources to obtain subject specific information,. - use a number of computer packages to present information. D2: The ability to work in groups: work with other as a part of a team to collect data and/or to produce reports and presentations. D3: The ability to communicate to improve Self-learning: - study independently, set realistic targets and plan work and time to met targets within deadlines. D4: Write reports Problem solving: - Regular problem exercises and example will give students the chance to develop their theoretical understanding and problem. D5: The ability to communicate: Students will have write reports and give oral presentation.
4. course content	- Thermodynamics of the superconducting transition. - London equation - Coherence length. - BCS theory of superconductivity - Flux quantization - Type 2 superconductors

	- Vortex state. - Josephson effect. - Macroscopic quantum interference. - SQUID. - Meissner effect- isotop effect - High temperature superconductors.
5. Teaching and learning methods	5.1. Teaching will be by lectures, exercises . 5.2. All learning outcomes are delivered through lectures. 5.3.All lectures and worked examples are given from the lecturer private notes. Instructional Methods include: • Direct Instruction: lecture, reading, in class research, problem sets, presentations, and guest speakers • Instructional Materials: textbook; primary and secondary materials, experts from the field, and electronic media • Team Teaching which will include business, university, and community based partners • Community based applied concept projects • Self-directed, cooperative, and collaborative learning projects.
6. teaching and learning methods for students with special needs	1- Over head projector 2- appropriate teaching accommodation and Computers 3- Laboratory with computer terminal.
7. Student Assessment	**7-1.** Semester Work. **7-2.** Mid-Term Examination .

	7-3. **Practical Examination** 7-4. **Final Term Examination**
a) Procedures used:	7.1. Reaserch and presentation to assess skills of presenting data and discussion. 7.2. Mid-Term Examination To accesses ability to **continue in course** 7.3. practical exam. To access professional and practical skills. 7.4. written exam. To accesses ability to remember &.understand scientific background. &.understand scientific background.
b) Schedule:	Assessment1:Semesterwork Week: 4-8 Assessment 2: Mid-term Week: 10 Assessment 3: Practical final Week: 12 Assessment 4: Written final Week: 14
c) Weighing of Assessment:	Mid-Term Examination: 10 Final-Term Examination: 200 Practical Examination: 30 Semester Work: 10 Total: 250
8. List of Textbooks and References:	----------
a) Course Notes	Lecturer private notes

b) Required Books (Textbooks)	**1- "*Superconductivity* "*Charles P. Poole, Jr.Horacio A. Farach, Richard J. Creswick*** ***Academic Press , Boston, second edition 2007*** **2- "Fundamentals of Photonics", B.E.A. Saleh, John Wiley & Sons, Inc.** **3- "Optical Holography", P.Hariharam, Cambridge Univ.Press, NewYork.**
c) Recommended Books	----------
d) Periodicals, web sites,…,etc	----------

Course Instructor: ---------- **Head of Department**

Date: -----/-----/---- **Prof. Dr. El. M. Elmaghrby**