Semester5

Example form for Module Handbook

Module designation	Physics
Module level, if applicable	5 th
Code, if applicable	PHYS. 313
Subtitle, if applicable	Not applicable
Courses, if applicable	Electronics-1
Semester(s) in which the module is taught	1 ST & 2 ND Semester
Person responsible for the module	D .Fatima AL Zahra M. Hassan
Lecturer	D. Sana .M. Barakat
Language	Arabic
Relation to curriculum	compulsory in B .Ed Physics plan study
Type of teaching, contact hours	Contact hours (lecture 45H, exercise30H, laboratory session15H,.) and private study, including examination preparation, specified in hours, ¹ and in total.
Workload	176
Credit points	(2 Theoretical + 1 Experimental)CH /5 ECTs
Requirements according to the examination regulations	The student shall be debarred from the final examination if the percentage of his absence exceeds (25%) out of the total lectures of the course without an acceptable excuse. The student who is debarred from the examination because of absence is considered as a failure in the course.
Recommended prerequisites	PHYS222

¹ When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Module objectives/intended	Objectives:		
learning outcomes	1.Understand the fundamentals of electronics.		
	2.To do some applications that depends on the basic principles of electronics.		
	3.To encourage the students to develop these applications		
	Knowledge		
	To recognize the importance of the electronics		
	To identify some properties of some electronic devices like diodes and transistors		
	To show the applications of the electronic devices		
	Cognitive Skills		
	Collect general information to the related topics.		
	Use the mathematical equations and related work to be use for the universe understanding.		
	Apply the gained mathematical and experimental knowledge in any physical related topic.		
	Interpersonal Skills & Responsibility		
	Work in a group and learn time management.		
	Learn how to search for information through library and internet		
	Present a short report in a written form and orally using appropriate scientific language		

List of Topics	No. Of Weeks	Contact Hours
Energy levels of electrons	1	2
Bands theory	1	2
Pure (and non pure) semiconductors	1	2
Charge carriers: electrons and holes	1	2
diode	2	4
Applications of diode	1	2
Types of diodes	1	2

Bipolar junction transistor			2		4	
Applications of PJT			2		4	
Field-effect transistor (FET)			1		2	
Types of FET			1		2	
Signal amplifiers			1		2	
Assess		ment task	We	ek Due	Proportion of Total Asses	n sment
	Midte	rm Exam		8	20	
Study and examination requirements and forms of examination	Homework, Quizzes, Discussions, Team Group, Projects, & Lab			14	20	
	Final Experimental Exam			15	20	
Final T E		heoretical xam		16	40	
Media employed	Data Show,.Smart .experiments		Board,	Blended,-	e-learning,White	Board
Reading list	ELECTRONIC DEVIC		CES, see	cond editior	, by THOMAS FLO	DYD

Module designation	Physics
Module level, if applicable	5 th
Code, if applicable	PHYS 314
Subtitle, if applicable	Not applicable
Courses, if applicable	Electrodynamics
Semester(s) in which the module is taught	1 ST & 2 ND Semester
Person responsible for the module	D .Fatima AL Zahra M. Hassan
Lecturer	Dr.Ismat Ali
Language	Arabic
Relation to curriculum	compulsory in B.Ed Physics study plan
Type of teaching, contact hours	Contact hours (lecture 60H, exercise45H, laboratory session15H,.) and private study, including examination preparation, specified in hours, ² and in total.
Workload	210
Credit points	4CH /7 ECTs
Requirements according to the examination regulations	The student shall be debarred from the final examination if the percentage of his absence exceeds (25%) out of the total lectures of the course without an acceptable excuse. The student who is debarred from the examination because of absence is considered as a failure in the course.
Recommended prerequisites	PHYS121

² When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Module objectives/intended	Objectives:		
learning outcomes	1. Understand the basic concepts of classical electrodynamics, e.g.,		
	electromagnetic waves and its propagation in different media and Maxwell relations.		
	2. Acquire the necessary skills (e.g mathematical and numerical skills) to solve electrodynamics problems and gain deeper understanding of the concepts		
	Knowledge		
	Remember the most important definitions and		
	concepts of mathematical calculations that used in		
	electrodynamics course		
	Cognitive Skills		
	1.derivative Poisson and Laplace equations from Gaussian law		
	2.Using Maxwell equations in determine the speed of light		
	3.Develop lines of argument and appropriate judgments in		
	accordance with handling electrodynamics theories 4.Manipulate problems of electromagnetic data		
	Interpersonal Skills & Responsibility		
	1-The student work independently.		
	2. The students learn independently and take up responsibility.		

List of Topics	No. Of Weeks	Contact Hours
Vectors , scalar product and dot product	2.	6.
-Divergence- gradient- curle in Cartesian,	.2.	6.
-Derivative Poisson and Laplace equations in cylindrical and spherical coordinates.	2	.6.
-displacement current by Maxwell theory	2.	6.

-derivative Maxwell's equa differential form.	tion in		2.	6.	
derivative Maxwell's equation in integral form		2.		6.	
-determination the speed of using wave equation with Max	light by well's	2		6	
equation					
Revesion			1	3.	
Tutorials		1	No. of	Contact Hours	
		V	Veeks	Contact Hours	
Problems Vectors , scalar prod dot product	duct and	2		6	
Problems Divergence- gradie in Cartesian,	nt- curle	2		6	
solve a problems on Poisson and Laplace equations		2		6	
solve a problems on Maxwell's equation in differential form		2		6	
solve a problems on Maxwell's equation in integral form		2		6	
determination the speed of light by using wave equation with Maxwell's		2		6	
Revision		3		9	
	Assess	ment task	Week Due	Proportion	
	/.00000		Hook Buo	of Total Assessment	
	Attend Oral di	lance and scussions	From 2 ^{ed}	10%	
Study and examination	(Quiz	4 th	10%	
requirements and forms of examination	Mid term exam		8 th	20%	
	Fina	al exam	16 th	60%	
Media employed	Data Show,.Smart Board, Blended, .experiments		e-learning,White Board		
Reading list	1- Foundations of Electromagnetic Theory; John R. Reitz			Theory; John R. Reitz,	
	Frederick J. Milford, and Robert				
	W. Chri Edition,	sty, Addiso 1980	n-Wesley Publish	ing Company, Inc., 3rd	

Module designation	Physics
Module level, if applicable	5 th
Code, if applicable	PHYS. 311
Subtitle, if applicable	Not applicable
Courses, if applicable	Quantum Mechanics (1)
Semester(s) in which the module is taught	1 ST & 2 ND Semester
Person responsible for the module	Dr .Fatima AL Zahra M. Hassan
Lecturer	Dr.Nagwa Ibrahim
Language	Arabic
Relation to curriculum	compulsory in B .Ed Physics plan study
Type of teaching, contact hours	Contact hours (lecture 45H, exercise45H,.) and private study, including examination preparation, specified in hours, ³ and in total.
Workload	144
Credit points	3CH /5 ECTs
Requirements according to the examination regulations	The student shall be debarred from the final examination if the percentage of his absence exceeds (25%) out of the total lectures of the course without an acceptable excuse. The student who is debarred from the examination because of absence is considered as a failure in the course.
Recommended prerequisites	PHYS224

³ When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Module objectives/intended	Objectives:
learning outcomes	Introduce students to: the principles of quantum mechanics, behavior waveform and beams of particles and interpretation of probabilistic function wave and equation Schrödinger equation, equation Hydrogen in one dimension, effects in quantum mechanics, the theory of angular momentum, the equation Hodnger of a particle in three dimensions and the hydrogen atom, determined angular momentum , perturbation theory of independent time
	Knowledge
	Recognize the importance of modern physics.
	Identify some of the important aspects and applications of quantum physics.
	Identify the theoretical foundation for Theoretical Physics.
	Cognitive Skills
	The student learns the principles of quantum mechanics,
	The student should be able to solve the Schrodinger equations
	To know the importance of modern physics in the development of modern scientific
	Interpersonal Skills & Responsibility
	Division students to groups to conduct joint research group
	Skills take responsibility and lead the team

List of Topics	No. Of Weeks	Contact Hours
The principles of quantum mechanics,	1	3
Follow the principles of quantum mechanics	1	3
Waveform behavior	1	3
The beams of the particles and the probabilistic interpretation of the wave function	1	3

Schrödinger equation	1	3
Hydrogen equation in one dimension	1	3
Theory of angular momentum	1	3
Effects in quantum mechanics,	1	3
Hydrogen equation for a particle in three dimensions	1	3
Hydrogen quation independent of time	1	3
Perturbation theory	1	3
Angular momentum and spin	1	3

	Assessment task	Week Due	Proportion of Total Assessment	
	Midterm Exam	8	20	
Study and examination requirements and forms of examination	Homework, Quizzes, Discussions, Team Group, Projects, & Lab	14	40	
	Final Theoretical Exam	16	40	
Media employed	Data Show,.Smart .experiments	Board, Blended,-	e-learning,White Board	
Reading list	.Quantum Physics, By: Stephen Gasiorowicz, 3rd edition, Wiley2003 ISBN:978-471-05700. introduction to Quantum Mechanics, David J. Griffiths (2nd Ed2004)			

Module designation	Physics		
Module level, if applicable	5 th		
Code, if applicable	PHYS. 312		
Subtitle, if applicable	Not applicable		
Courses, if applicable	Electromagnetism-2		
Semester(s) in which the module is taught	1 ST & 2 ND Semester		
Person responsible for the module	Dr .Fatima AL Zahra M. Hassan		
Lecturer	Dr. Isamt Ali		
Language	Arabic		
Relation to curriculum	compulsory in B.Ed Physics study plan		
Type of teaching, contact hours	Contact hours (lecture 60H, exercise45H, laboratory session15H,.) and private study, including examination preparation, specified in hours, ⁴ and in total.		
Workload	210		
Credit points	4CH /7 ECTs		
Requirements according to the examination regulations	The student shall be debarred from the final examination if the percentage of his absence exceeds (25%) out of the total lectures of the course without an acceptable excuse. The student who is debarred from the examination because of absence is considered as a failure in the course.		
Recommended prerequisites	PHYS222		
Module objectives/intended	Objectives:		
learning outcomes	Understand the fundamentals of electromagnetism.		
	2. To do some applications that depends on the basic principles of electromagnetism.		
	3. To encourage the students to develop these applications		
	Knowledge		
	To recognize the importance of the electromagnetism		
	To identify some properties of the electromagnetism		
	To show some applied researches in this field		
	Cognitive Skills		

⁴ When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

	Collect general inform	nation to the related topi	CS.
	Use the mathematica the universe understa	I equations and related anding.	work to be use for
	Apply the gained ma any physical related t	thematical and experiment	ental knowledge in
	Interpersonal	Skills & Respon	sibility
	Work in a group and	earn time management.	
	Learn how to search	for information through I	ibrary and internet
	Present a short rep appropriate scientific	oort in a written form language	and orally using
Content			
List of Topic	s	No. Of Weeks	Contact Hours
Magnetic Fields of the Electric (Rule, Biot-Savart Law	Current, Right Hand	1	3
Ampere's Law, Electric Voltage	, Problems	1	3
Applications on the Ampere's La	aw, Problems	1	3
A Charge Moving in a Magnetic Field, Definition of the Coulomb & Ampere		1	3
Magnetic Force, Torque, Right Hand Rule, Problems		1	3
Faraday's Low, Self & Mutual Ir	1	3	
Coils Inductance Connecting, Increasing & Decreasing the Current in the Inductance Circuits		1	3
Density of Energy for a Magnetic Field, Electric Driver		1	3
Dynamos, Transformers, Transferring	1	3	
Magnetization Strength, Magn Currents	1	3	
Paramagnetic Materials, Ferromagnetic Materials, Diamagnetic Materials		1	3
Galvanometer, Magnetic Flux G	1	3	
LC-Circuit, Resonance Circuit		1	3
Bridges that can be used in Circuits	1	3	

Experiment Number		Experiment Subject					
1	Galvanomete	anometer					
2	Charge to Ma	ass Ratio					
3	Determinatior	n of the Self Inductan	ce Coefficient for	a Coil			
4	Connection o	f Self Inductance Co	ils in Series & in P	arallel			
5	Charging & D	ischarging of a Capa	citor with existing	an Inductance Coil			
6	Magnetic Ret	ardation Cycle					
7	Phase Relation	ons in Alternating-Cu	rrent Circuits				
8	Series & Para	allel Resonance Circu	uits				
9	Materials Coe	efficient					
10	Maxwell's Bri	dge					
11	Mutual Induct	ance Bridge					
12	Cyclic Curren	urrents and Hall Effect					
13	General Revi	Revision					
14	Final Exam	al Exam					
		Assessment task Week Due Proportion					
		of Total Assessment					
		Midterm Exam	8	20			
Study and examination requirements and forms of examination		Homework, Quizzes, Discussions, Team Group, Projects, & Lab	14	20			
		Final Experimental Exam	15	20			
		Final Theoretical Exam	16	40			
Media employed	b	Data Show,.Smart Board, Blended,- e-learning,White Board .experiments					
Reading list		Electromagnetism, by M. H. AL Naby, 5ed, Arabic Nahdah Library, Alqahera, 1989.					

Semester6

Example form for Module Handbook

Module designation	PHYSICS
Module level, if applicable	6 th
Code, if applicable	PHYS324
Subtitle, if applicable	Not applicable
Courses, if applicable	Electronics-2
Semester(s) in which the module is taught	1 st & 2 nd Semester
Person responsible for the module	Dr. Fatima AL Zahra M. Hassan
Lecturer	Dr. Sana .M. Barakat
Language	Arabic
Relation to curriculum	compulsory in B.Ed Physics plan study
Type of teaching, contact hours	Contact hours (lecture 45, exercise30, laboratory session15,.) and private study, including examination preparation, specified in hours, ⁵ and in total.
Workload	154
Credit points	(2 Theoretical + 1 Experimental)CH /5 ECTs
Requirements according to the examination regulations	The student shall be debarred from the final examination if the percentage of his absence exceeds (25%) out of the total lectures of the course without an acceptable excuse. The student who is debarred from the examination because of absence is considered as a failure in the course.
Recommended prerequisites	PHYS313

⁵ When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Module objectives/intended	Objectives:			
learning outcomes	1. Understand and analyze relatively simple electronic layouts and circuits.			
	2. Design special purpose circuits that meet his requirements in his scientific life			
	3.To encourage the students to develop these applications			
	Knowledge			
	Learning fundamentals in electronics and electronic elements			
	Understanding the physics of electronics and their applications mentioned in the text.			
	Improving logical thinking Improving logical thinking			
	Ability to understand and design simple electronic circuits			
	Ability to explain how things work			
	Cognitive Skills			
	Collect general information to the related topics.			
	Use the mathematical equations and related work to be use for the universe understanding.			
	Apply the gained mathematical and experimental knowledge in any physical related topic.			
	Interpersonal Skills & Responsibility			
	Work in a group and learn time management.			
	Learn how to search for information through library and internet			
	Present a short report in a written form and orally using appropriate scientific language			

List of Topics	No. Of Weeks	Contact Hours
Thyristors: Shockley diod –Diac -, Triac, - operational amplifiers and their types	4	8
frequency response curve of operational amplifiers	2	4
Feedback and its types	2	4

oscilitors and their types- Active Filters and their types		2		4
properties of Filters		2		4
Integrated circuits			2	4
revision			1	2
	Assessment task		Week Due	Proportion
			Week Due	of Total Assessment
	Midte	rm Exam	8	20
Study and examination requirements and forms of examination	Homework, Quizzes, Discussions, Team Group, Projects, & Lab		14	20
	Final Experimental Exam		15	20
Final		heoretical xam	16	40
Media employed	Data Show,.Smart .experiments		Board, Blended,-	e-learning,White Board
Reading list	1-Ben G. Streetn Prentice – Hall Ind		nan, Solid State c., 1990.	Electronic Devices,
	2-Sze, Tech New 3-Runy Instrum	S. M., Sonology, A ⁻ Jersey, Jol an, W. R., Mentation,	emiconductor D T& T Bell Labo hn Wiley & Sons Semiconductor Internatio	Devices-Physics and pratories,Murray Hill, , 1985. Measurements and pnal Students
	edition,McGraw-Hill,Kogakusha			

Module designation	PHYSICS
Module level, if applicable	6 th
Code, if applicable	PHYS322
Subtitle, if applicable	Not applicable
Courses, if applicable	Quantum Mechanics 2
Semester(s) in which the module is taught	1 st & 2 nd Semester
Person responsible for the module	Dr. Fatima AL Zahra M. Hassan
Lecturer	Dr. Rasha Abd Alhai
Language	Arabic
Relation to curriculum	compulsory in B.Ed Physics plan study
Type of teaching, contact hours	Contact hours (lecture 45) and private study, including examination preparation, specified in hours, ⁶ and in total.
Workload	112
Credit points	3 CH /5 ECTs
Requirements according to the examination regulations	The student shall be debarred from the final examination if the percentage of his absence exceeds (25%) out of the total lectures of the course without an acceptable excuse. The student who is debarred from the examination because of absence is considered as a failure in the course.
Recommended prerequisites	PHYS311

⁶ When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Module objectives/intended	Objec	tives:			
learning outcomes	Derivation of mathematical methods, such as semi- classical approximation and variational principle and turbulence theory, in order to obtain approximate solutions of the Schrodinger equation.				
	. Defin thus e of the	ition of spin and the Pauli explain the mathmatical basi elements	exclusion principle, and ics of the periodic table		
	quantum theory of the interaction of electromagnetic radiation with the use of temporal turbulence theory				
	The us betwee cross the qua	se of dispersion theory to en the particles, and thus section of a dispersion and antum theory calculated.	achieve the interaction the probability or the d can be inferred from		
	Knov	vledae			
	recogr	izes the angular momentum	and operators		
	Recognizes the approximate methods of quantum mechanics to solve problem				
	Remer metho	mbers the laws and principles of approximate			
	Known scattering theory and its application				
	Cogr	nitivo Skille			
	Cogi		in the Parkt of substitute		
	learne mathe	es the physical phenomena d from the foundatior matical	a in the light of what he hs of physical and		
	Data s approp	sets of physical issues a priate laws to resolve	nd then determine the		
	Disting	uish between the various a	oproximate methods		
	Inter	personal Skills & Re	sponsibility		
	Stude	ents salving study			
	work with colleagues in a team spirit				
	able to diction and group discussion				
Content	<u> </u>				
List of Topics		No. Of Weeks	Contact Hours		

Angular momentum and rewindi angular momentum vector for a particle - matrix representation function and values of self-funct Pauli exclusion principle periodic elements. Swing spin in an magnetic field.	ing spin: range of n - self tion spin. table of external		3	9
Approximate methods of quantum mechanics: semi-classical approximation (WKB) and its applications Variational principles in quantum mechanics: Ritz variational principle Riley - limits on the energy levels of quantum systems.		3		9
Perturbation theory: Rayleigh-Schrodinger independently of time Perturbation theory. Energy levels of disturbances due to external electromagnetic fields - Stark effect on the ground state of the hydrogen atom - Zeeman effect		3		9
Systems varying with time: the study of time -dependent Schrödinger equation The expected values of the physical quantities - Ferrell quantity theory - different representations in quantum mechanics: Schrödinger representation - representation Heisenberg - internal representation of mutual influence - Dirac formats		3		9
Perturbation theory situations varying with time - absorption and emission - green function		1		3
Scattering theory: the definition of the cross-section of the scattering and scattering amplitude Born approximation		2		6
	Assess	ment task	Week Due	Proportion of Total Assessment
	Midter	rm Exam	8	20
Study and examination requirements and forms of examination	Horr Qu Discussi Group, I	nework, izzes, ions, Team Projects, & Lab	14	40

	Final Theoretical Exam	16	40	
Media employed	Data Show,.Smart .experiments	Board, Blended,-	e-learning,White Board	
Reading list	* Introduction to quantum mechanics, David J. Griffith, Printice Hall, 2004.			
	 *"Quantum Mechanics" Volumes 1 & 2, by Claude Cohen- Tannoudji, Bernard Diu, and Franck Laloe (1977 John Wiley & Sons). * Introductory Quantum Mechanics, R.L. Liboff, Addison-Wesley * Principles of quantum mechanics. R. Shankar Quantum physics, Stephen Gasiorwics, John Wiley & Sons, 2003. 			
	* Quantum mechanics, L. I. Shiff, Mc Grow Hill, 1986.			

Module designation	PHYSICS
Module level, if applicable	6 th
Code, if applicable	PHYS321
Subtitle, if applicable	Not applicable
Courses, if applicable	Statistical Physics
Semester(s) in which the module is taught	1 st & 2 nd Semester
Person responsible for the module	Dr. Fatima AL Zahra M. Hassan
Lecturer	Dr. Sana .M. Barakat
Language	Arabic
Relation to curriculum	compulsory in B.Ed Physics plan study
Type of teaching, contact hours	Contact hours (lecture 45, exercise30, laboratory session15,.) and private study, including examination preparation, specified in hours, ⁷ and in total.
Workload	154
Credit points	3 CH /5 ECTs
Requirements according to the examination regulations	The student shall be debarred from the final examination if the percentage of his absence exceeds (25%) out of the total lectures of the course without an acceptable excuse. The student who is debarred from the examination because of absence is considered as a failure in the course.
Recommended prerequisites	PHYS214

⁷ When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Module objectives/intended learning outcomes

Objectives:

1. Understanding of the basic principles of Statistical physics .

2. Make the connections between classical equilibrium thermodynamics and the basic statistical mechanics, which includes analytical and numerical calculations of Partition Functions, towards solutions of various problems, including the problems about 1) ideal and real gases, 2) simple models of solids, 3) quantum gases, and other thermodynamic systems

3. Explanation statistical of systems that contains large number of particles

4. Statistical distribution functions: Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac

Knowledge

the ability to understand and apply the principles of statistical mechanics on ensembles of molecules

the ability to understand the association between statistical mechanics and thermodynamics

deep understanding of how intermolecular interaction affects the properties of matter

the ability to use statistical mechanical computer programmers to calculate the properties of macroscopic systems

Cognitive Skills

We will apply the principles of statistics to develop (1) the concepts of ensembles and distribution functions;

(2) statistical mechanical expressions for thermodynamic functions;

(3) models of polyatomic gases, monatomic crystals, polymers.

Interpersonal Skills & Responsibility

Work in a group and learn time management.

Learn how to search for information through library and internet

Present a short report in a written form and orally using appropriate scientific language

List of Topics			No. C	of Weeks		Contact Hours
 Basics of probability and statistics: probability distributions, statistical averages, law of large numbers, random walk, examples of various distributions. Thermodynamics entropy, distinguishable and indistinguishable particles, Boltzmann statistics, Maxwell-Boltzmann distribution. Foundations of statistical mechanics. Microstates. Quantum and classical systems. 		3			9	
2. Partition function of an	ideal gas,			3		9
diatomic gas: vibrational and modes, the total heat capacit gas.	rotational sy of a diatomic					
3. Microcanonical, canonic canonical statistical ensembl	cal and grand es.			3		9
 canonical statistical ensembles. 4. Fermi-Dirac and Bose-Einstein s (calculated by two methods), and applied to free electron the Bose-Einstein condensation. 		3 9			9	
5. Thermodynamics of radiation, blackbody spectrum, Bose-Einstein gases, Bose-Einstein condensation, liquid helium			3		9	
	Assessment ta	sk	sk Week Due			Proportion
					of Total Assessment	
	Midterm Exam	ר		8		20
Study and examination requirements and forms of examination	Homework, Quizzes, Discussions, Team Group, Projects, & Lab			14	40	
	Final Theoretical Exam			16	40	
Media employed	Data Show,.Sm .experiments	nart	Board,	Blended,-	e-leai	rning,White Board
Reading list	Mandl, F. sta	tisti	cal phys	sics, 2 nd ec	l. (W i	iley, 1988)
	Reif , F. funda (McGraw Hill ,	men , 196	tals of s 65)	statistical	and	thermal physics

Module designation	PHYSICS
Module level, if applicable	6 th
Code, if applicable	PHYS323
Subtitle, if applicable	Not applicable
Courses, if applicable	Solid state -1
Semester(s) in which the module is taught	1 st & 2 nd Semester
Person responsible for the module	Dr. Fatima AL Zahra M. Hassan
Lecturer	Dr. Emad Alhami
Language	Arabic
Relation to curriculum	compulsory in B.Ed Physics plan study
Type of teaching, contact hours	Contact hours (lecture 45, exercise30, laboratory session15,.) and private study, including examination preparation, specified in hours, ⁸ and in total.
Workload	154
Credit points	(2 Theoretical + 1 Experimental)CH /5 ECTs
Requirements according to the examination regulations	The student shall be debarred from the final examination if the percentage of his absence exceeds (25%) out of the total lectures of the course without an acceptable excuse. The student who is debarred from the examination because of absence is considered as a failure in the course.
Recommended prerequisites	None

⁸ When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Module objectives/intended learning outcomes

Objectives:

To be known about solid state crystal growth, solid objects amorphous and Allamthblorh and nanoparticles, interdependence atomic crystal structure and lattice, transactions Millar, constants crystalline defects crystalline, Fourier analysis systems repeatability, dispersion wavelength and lattice inverted, areas Berluan, X-rays and Hyudha, phonons and oscillation crystal,thermal properties of materials, heat capacity, distribution Blanc, density of states, Debye model, the Einstein model, free-electron model (Fermi gas)

Knowledge

Understanding and Knowing about solid state crystal growth, solid objects amorphous and nanoparticles, interdependence atomic crystal structure and lattice, transactions constants defects Millar, crystalline crystalline, Fourier analysis systems repeatability, dispersion wavelength and lattice inverted, areas Berluan, X-rays and Hyudha, phonons and oscillation crystal, thermal properties of materials, heat capacity, distribution Blanc, density of states, Debye model, the Einstein model, free-electron model (Fermi gas

Cognitive Skills

Accessing Information Skill,Note Taking Skill

Drawing Conclusion Skill,The skill of determining causeeffect relationship,Classifying skill,Developing concepts skill,The skill of generating and testing hypotheses

Comparing and contrasting skill, Managing attention skill

Problem-solving skill, Questioning skill.

Interpersonal Skills & Responsibility

Work in a group and learn time management.

Learn how to search for information through library and internet

Present a short report in a written form and orally using appropriate scientific language

List of Topics	No. Of	Contact Hours
	Weeks	Contact Hours

Definition solid state crystal grow objects amorphous and nanoparti	vth, solid cles.		2		4
interdependence atomic crystal and lattice,.	structure		2		4
transactions Millar,			1		2
constants crystalline defects crystalline		2			4
Fourier analysis systems repeatability,.		2			4
dispersion wavelength and lattice inverted, areas Berluan,		2			4
X-rays and Hyudha, phonons and oscillation crystal,thermal properties of materials		1			2
heat capacity, distribution Bla density of states	anc and		1		2
Debye model, Einstein model a electron model (Fermi gas).	ind free-		2		4
	٨٥٥٩٥٩	mont task	Wo		Proportion
	A33633	inent task	VVEEK DUE		of Total Assessment
	Midterm Exam			8	20
Study and examination requirements and forms of examination	Homework, Quizzes, Discussions, Team Group, Projects, & Lab			14	20
	Final Experimental Exam			15	20
	Final Theoretical Exam			16	40
Media employed	Data S .experim	how,.Smart ents	Board,	Blended,-	e-learning,White Board
Reading list	1- "An Introduction to Solid States Physics", C. Kittle, 6th Edition, John Wiley & Son Inc (1986).				
	Harcour	t Asia Pte I	td (197	6).	
	3- "Introduction to condensed matter physics." Feng Duan & Jin Guojun, (World Scientific, 2005).				er physics." Feng c, 2005).

Module designation	PHYSICS
Module level, if applicable	6 th
Code, if applicable	PHYS387
Subtitle, if applicable	Not applicable
Courses, if applicable	Nanotechnology
Semester(s) in which the module is taught	1 st & 2 nd Semester
Person responsible for the module	Dr. Fatima AL Zahra M. Hassan
Lecturer	Dr. Ismat Ali
Language	Arabic
Relation to curriculum	Elective course in B .Ed Physics plan study
Type of teaching, contact hours	Contact hours (lecture 45, exercise30, laboratory session15,.) and private study, including examination preparation, specified in hours, ⁹ and in total.
Workload	80
Credit points	2 CH/3ECTs
Requirements according to the examination regulations	The student shall be debarred from the final examination if the percentage of his absence exceeds (25%) out of the total lectures of the course without an acceptable excuse. The student who is debarred from the examination because of absence is considered as a failure in the course.
Recommended prerequisites	None

⁹ When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Module objectives/intended	Objectives:					
learning outcomes	1 . Nature, importance, principles of nanotechnology					
	2. Properties of nano particles and forms of of nano materials					
	3. Microscopes in nanotechnology					
	4. Developments of nanotechnology in different science					
	Knowledge					
	To know the importance of nanotechnology					
	To know some applications of nanotechnology					
	To know some researches in the fields of nanotechnology					
	Cognitive Skills					
	Collect general information to the related topics.					
	Use the mathematical equations and related work to be use for the universe understanding.					
	Apply the gained mathematical and experimental knowledge in any physical related topic.					
	Interpersonal Skills & Responsibility					
	Work in a group and learn time management.					
	Learn how to search for information through library and internet					
	Present a short report in a written form and orally using appropriate scientific language					

List of Topics	No. Of Weeks	Contact Hours
Essential expressions in nanotechnology	1	2
Important stages in nanotechnology- development	1	2
Different principles of nanotechnology	1	2
Properties of material at nano scale	1	2
Forms of nano materials	1	2
Problems	1	2
Mid Exam	1	2

General importance of nanotechnology		1		2	
Methods to reach the nano vol	ume	1		2	
Basic requirements to construct the material		1		2	
Microscopes in nanotechnology		1		2	
Uses of nanotechnology		1		2	
Creations in nanotechnology		1		2	
Nanotechnology-situation in th	ne world		1	2	
Nanotechnology-situation in Arab countries, i.e.: in KSA		1		2	
Final Exam			1	2	
	Assessme	nt task	Week Due	Proportion of Total Assessme	ent
	Midterm I	Exam	8	20	
Study and examination requirements and forms of examination	Midterm Homew Quizze Discussions Group, Pro	Exam rork, es, s, Team jects, &	8	20	
Study and examination requirements and forms of examination	Midterm I Homew Quizze Discussions Group, Pro Lab Final Exper Exan	Exam rork, es, s, Team jects, & rimental n	8 14 15	20 20 20 20	
Study and examination requirements and forms of examination	Midterm I Homew Quizze Discussions Group, Pro Lab Final Exper Exan Final Theo Exan	Exam rork, es, s, Team jects, & rimental n pretical n	8 14 15 16	20 20 20 20 40	
Study and examination requirements and forms of examination Media employed	Midterm I Homew Quizze Discussions Group, Pro Lab Final Exper Exan Final Theo Exan Data Show .experiments	Exam rork, es, s, Team jects, & rimental n oretical n v,.Smart s	8 14 15 16 Board, Blended,-	20 20 20 20 40 e-learning,White Boa	ard