

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	30	0	50	2	-	2

لغة انجليزية (1)	م ١٥ ج
English Language (1)	UR015

#### 1- Listening & Speaking:

A- (Listening): This part of the course aims at training the students for listening and understanding audio-visual material

B- (Speaking): This part helps the students to speak simple and correct short sentences fluently.

#### 2- Reading:

This part aims at training students for correct reading, building up vocabulary and promoting grammatical structures.

#### 3- Writing:

This part helps the students to spell English words correctly and to use the punctuation marks.

#### 4- Grammar:

This part aims at providing the students with knowledge of the grammar of the target language, and its basic structures.

#### 5- Translation:

This part aims at developing the students' abilities in translating scientific texts both into and from English.

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10	10	30	0	50	2	-	2

لغة انجليزية (2)	م ٢٠ ج
English Language (2)	UR020

#### II- English Language (2): 2 hours per week in the 2nd term

##### Terminology:

This course aims at introducing the students to the Morphology of the target language . The students study the structure of words. They start with understanding the meaning of a morpheme, then they learn the different types of morphemes, after that they intensively learn the use of affixes. Finally, they end with learning lists of scientific terms in the different fields of science with an increasing ability to guess the meaning of any new term, especially after studying prefixes & suffixes as mentioned above.

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	30	0	50	0	-	

قضايا مجتمعية	م ٥٠ ج
Societal Issues	UR050

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	30	0	50	2	-	2

ادارة اعمال	م ١١ ج
Management	UR011

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	30	0	50	2	-	2

تاريخ العلوم	م ١٢ ج
History of Science	UR012

#### The importance of studying history of science

An overview on the science of ancient scientists

Presentation of the history of most prominent theories in mathematics and physics

Presentation of the history of the most important developments of biological sciences (embryogenesis, photosynthesis, genetic engineering, reproduction).

Philosophical reflections of modern biology.

Means of honoring scientists

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	30	0	50	2	-	2

التغذية الصحية

م ١٣ ج

Healthy Feeding

UR013

- 1- A healthy diet and our body
- 2- Components of healthy diet: carbohydrates, lipids, proteins, minerals, vitamins, and fiber.
- 3- Healthy eating pyramid.
- 4- How to read and interoperate nutrition facts.
- 5- Feeding control and the factors that regulate the quantity of food intake especially Leptin and Ghrelin
- 6-Physiology of the Human digestive system (digestion, absorption, metabolism and elimination)
- 7- Anabolic and catabolic hormones.
- 8- Definition and calculation of basal metabolic rate (BMR).
- 9- Body mass index and body volume index.
- 10- Feeding abnormalities (Obesity and malnutrition)
- 11- Definition and types of food additives with E number.
- 12- Example for some popular diseases (bronchial asthma, hypertension, anemia, coronary artery disease, hepatitis, diabetes mellitus, Alzheimers)

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oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	30	0	50	2	-	2

التفكير العلمي

م ١٤ ج

Scientific Thinking

UR014

- The nature of scientific thinking  
Characteristic of scientific thinking  
The importance of scientific thinking for the renaissance of societies  
Obstacles of scientific thinking practices  
Science and non-science  
Distinguish between facts and myths  
Scientists' personality  
Using scientific thinking to identify and solve problems  
Different scientific approaches to solving the problems

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	30	0	50	2	-	2

لغة عربية

م ١٦ ج

Arabic Language

UR016

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	10	20	50	2	2/-	2

الحاسب الالى

١٠٠ ار

Computer Sciences

MC100

- Fundamentals of programming and computer languages - Algorithm and Flowcharts - Elements of Language under case - Basic Instructions in Language under case - Control Instructions - Arrays and dimension statement - Subprograms - Some applications.

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	30	0	50	3	-/2	2

رياضيات عامة (1)

١٠٠ ار

Mathematics (1)

M100

- Calculus: Functions of one variable - Limits and Continuity - Derivatives - Applications of Differentiation - Taylor and McLaurin series, Indefinite and definite integrals.  
Algebra: Mathematical induction - series - Partial fractions - Matrices and systems of linear equations -

Approximate solutions of non-linear equations.

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10	10	30	0	50	3	-/2	2

رياضيات عامة (2) ١٠٥

Mathematics (2) M105

Calculus: Techniques of integration - Definite integrals and their properties- improper integral - numerical integration - Applications of definite integrals.

Geometry: Coordinate systems in the plane - Straight lines and circles in general forms - Conic sections - Geometric transformations in the plane - Coordinate systems in the space - The plane and the straight lines in the space and surfaces of revolution of second order.

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10	10	10	20	50	3	3/-	2

فيزياء عامة (1) ١٠٠

Physics (1) P100

Physical quantities - Units and dimensional analysis - Vectors - The laws of motion in one- and two- dimensions and its applications - Newtown's second Law of motion and its applications. Work and energy - Heat and heat conduction - The kinetic theory of gases - Specific heat of gases - First law of thermodynamics. 12 Experiments related to the above topics.

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10	10	10	20	50	3	3/-	2

فيزياء عامة (2) ١٠٥

Physics (2) P105

The nature and propagation of light - Reflection and refraction at plane surface - Lenses & Mirrors, Eye's structure and camera - Microscopes and Telescopes - Coulomb law and electrostatic fields - Electrostatic potential- Capacitance and dielectrics- Electric current, DC circuits and Krichhoff's Rules-Magnetic field and magnetic force - Electromagnetic induction. 12 Experiments related to the above topics.

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10	10	10	20	50	3	3/-	2

كيمياء عامة (1) ١٠٠

Chemistry (1) C100

(A):Atomic Spectra – Electron Orbital and Quantum Numbers – Quantum Energy Levels in Atoms – Basic Concepts of Bonding Electronegativities – Lewis Structure – The Octat Rule – Dipolemoment – Resonance Hybridization in Molecules – Geometrics of Molecules – Orbital Configuration for Diatomic Molecules.

(B):State of Matter – Introduction in Surface and Colloids Chemistry – Electrolytic Cell – Electrochemical Cells – Potential of Electrode (Selected practical experimentals )

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كيمياء عامة (2) ١٠٥

Chemistry (2) C105

(A): Chemical Equilibrium – Ionic Equilibrium – Basic of Qualitative Analysis – Solution Chemistry.

(B):Introduction on Organic Chemistry-Bonding in Organic compounds – Hybridization in Carbon Compounds – Physical Properties of Org. Compounds – Nomenclature, Synthesis and Chemical Reactions of alkanes, alkenes and alkynes

(Practical: Selected practical experiments)

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اساسيات الجيولوجيا ١٠٠

Principles of Geology G100

**Origin of Planet Earth: Constituents of the Earth's crust (crystals, minerals, rocks) – Classification of rocks**  
**Internal Processes: Dynamics, structures and plate tectonics – Development of structural traps and ore deposits**  
**External Processes: Weathering – Erosion – Wind action – Geological work of waters (surface, groundwater, seas and oceans) – Formation of hydrocarbons and sedimentary ores – Development of stratigraphic traps**  
**Time scale: Geologic timescale and fossil records**

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10	10	10	20	50	3	3/-	2

حيوان عام	ح ١٠٠
General Zoology	Z100

**Protoplasm - Organization and function of animal cell - Study of the animal tissues - Life functions - Introduction to early development of animals - Characters and classification of the major animal phyla**

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oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	10	20	50	3	3/-	2

نبات عام	ان ١٠٠
General Botany	B100

**Cell structure – plant tissues – Anatomy of primary plant organs – Classification of plant kingdom – General aspects of virus, bacteria, algae and fungi – Flower structure, inflorescences and fruits – Selected families of flowering plants**

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10	10	30	0	50	2	-	2

اخلاقيات وأداب المهنة والسلامة المهنية	F٣٠٠
Scientific Ethics&Safety	F300

**Definition of Ethics and Professional Ethics- Sources of the ethical principles- Benefits- Common mistakes about the professional ethics- Ethics of university teaching , research and authoring and supervising - Citation and Plagiarism-Intellectual property Ethics teacher pre-university- Ethics and the ethics of practicing the profession of medical laboratory- Biological ethics - Ethics of Computer and multimedia- Ethics in works in general- Professional Reports-Role models– Ethics and behavior- Vocational training- Training on the preparation and issuance of the Code of ethics in the work - Code of Ethics for certain related professions. Occupational Safety: Public safety conditions - signs extension - scientific laboratory safety –Securing facilities from fire hazards– First aid - safety in industrial buildings - a list of conditions of safety and prevention-Crisis and emergency management.**

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تفاضل وتكامل متقدم	٢١١ر
Advanced Calculus	M211

**Functions of several variables - Partial Derivatives and their applications - Multiple integrals (double – triple) and their applications - Line and Surface integrals - Using Mathematica, and Matlab programs for graphing some Surfaces and calculate some integrals.**

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معادلات تفاضلية (1)	٢١٢ر
Differential Equations (1)	M212

**Formation of ordinary Differential Equations (ODE's) - ODE's of first Order and first Degree – ODE's of first Order and higher Degrees - Applications – Linear ODE's of higher Orders with constant Coefficients and its applications - Linear ODE's of higher Orders with Variable Coefficients - Simultaneous Linear ODE's.**

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10	10	30	0	50	3	-/2	2

جبر خطي وهندسة فراغية	٢٢١ر
Linear Algebra and Geometry	M221

Vector spaces – Linear transformations – Properties of linear transformations (range and kernel) - Algebra of linear transformations- Eigenvalues and Eigenvectors -Inner product spaces- Self adjoint transformations Bilinear and quadratic forms. Reduction of quadratic forms in  $R_n$  – Applications in Geometry.

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10	10	10	20	50	3	2/-	2	

البرمجة الشيئية ٢٥١رك

Object-oriented Programming MC251

Objects and classes - Understanding class definitions - Object interaction - Grouping objects - More sophisticated behaviour - libraries - Well-behaved objects - testing, maintaining, debugging - Designing classes.

الدرجات						الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	
10	10	30	0	50	3	0	3	

فيزياء الاهتزازات والموجات ٢١٢ف

Vibrations and Waves P212

The simple harmonic motion in mechanical and electrical systems - The damped oscillation in mechanical and electrical systems - The forced damped oscillation in mechanical and electrical systems - Summation of the simple harmonic motions in two dimensions - Types of the waves, reflection and transmission of the waves - The ultra-sonic waves - Doppler's effect.

الدرجات						الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	
10	10	30	0	50	3	0	3	

فيزياء حديثة ٢١٥ف

Modern Physics P215

Principles modern physics - Black-body radiation - Planck's law of radiation, photo-electric effect - The Hydrogen atom, Rutherford model of the atom - Bohr's theory, Sommerfeld's theory - Compton effect - Dual nature of matter, De Broglie waves, the uncertainty principle Special theory of relativity: Galilean and Lorentz transformations, Michelson-Morley experiment, The two postulates of special theory of relativity. Doppler effect.

الدرجات						الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	
10	10	30	0	50	3	0	3	

ديناميكا حرارية ٢٢٣ف

Thermodynamics P223

Thermodynamics basic definitions -Adiabatic and isothermal process - Heat engine and Carnot's cycle - The 2nd law of thermodynamics - The entropy and thermodynamic potential - Important thermodynamic relations - Applications on Maxwell's equations - The 3rd law of thermodynamics - The principles of gas liquefaction.

الدرجات						الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	
10	10	30	0	50	3	0	3	

فيزياء الفلزات والسبائك  
والسيراميكات ٢٥٦ف

Physics of Metals, Alloys and Ceramics P256

Types of materials, Phase diagrams - Physics of metals and alloys  
Crystal structure of metals- Melting of metals, grain size- Re-crystallization and grain growth - Solid solutions - Alloys phase diagrams. Examination by electron microscopy- Processing of ceramic materials - Composite materials - Metal matrix and ceramic matrix composites - Polymeric materials processing - Deformation and strengthening of polymers.

الدرجات						الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	
10	10	30	0	50	3	0	3	

كهربية ومغناطيسية وتيار متردد ٢٦١ف

Electricity and AC Current P261

RL and RC circuits, stored energy - RLC circuit under its different conditions. Alternating current: RL and RC circuit analyses - Analyses of AC circuits in terms of complex numbers - AC transient current for RL, RC and RLC circuits. Magnetic quantities – Electromagnetism – Para-and diamagnetism - Ferromagnetism – Sources

of magnetic field-Ampere's Law and magnetic flux- Faraday's and Lenz Laws and motional emf. Electromagnetic waves and Maxwell equations.

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	20	20	50	0	1	3/-	0

معمل كهربية ومغناطيسية وتيار متردد

ف ٢٦٥

Electricity and AC Laboratory P265

12 Experiments in related topics

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	30	0	50	3	0	3

بصريات فيزيائية واليااف بصرية

ف ٢٧١

Physical Optics and Optical Fibers P271

Waves motion and superposition - Interference of light waves - Interference pattern from double slits (Young's experiment) - Interference of light in thin films - Diffraction of light waves - Single slits diffraction - The diffraction grating, resolving power of the diffraction grating - X-rays diffraction by crystals - Polarization of light waves- Introduction to laser physics - Optical fibers and its applications in medicine and communications.

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	20	20	50	0	1	3/-	0

معمل ديناميكا حرارية وبصريات فيزيائية

ف ٢٧٥

Thermodynamics and Physical Optics lab Laboratory P275

12 Experiments in related topics

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	30	0	50	3	0	3

معادلات تفاضلية جزئية ودوال خاصة

ر ٣١٨

Partial Differential and Special Functions M318

Partial differential equations – Partial differential equations of first order – Linear partial differential equations of second and higher orders with constant coefficients – Gamma and Beta functions – solution in infinite series of linear differential equations (Frobenius method) – Hypergeometric functions (Gauss functions) – Bessel, Hermite, and Laguerre functions.

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	30	0	50	3	0	3

ممتدات

ر ٣١٩

Tensors M319

n-dimensional spaces – Coordinate transformations - First and second order tensors - Covariant and contravariant - Laws of transformations - Higher order tensors – Algebraic operations on tensors – Metric form – Metric tensor and its conjugate - Christoffel symbols of first and second kinds - Covariant derivative - Intrinsic derivative - Physical and geometrical applications.

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	30	0	50	3	0	3

تحليل عددي (1)

ر ٣٢٣

Numerical Analysis (1) M323

Errors in Numerical computation - Solutions of Non-linear Equations - Direct and Iterative Methods for Solving Linear Systems - Interpolation and Polynomial approximations - Numerical differentiation - Numerical Integration.

الدرجات					الساعات			الدوائر المنطقية	٣٦١ رك
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L		
10	10	10	20	50	3	2/-	2	Logic Circuits	MC361

Basic logic concepts – combinational logic – multiplexers and de-multiplexers, encoders, decoders, adders and subtractors – look-ahead carry – comparators – programmable logic arrays and memories – design with MSI, logic families, tri-state devices, CMOS and TTL logic interfacing – Sequential logic – analog and digital conversion – data acquisition – microprocessors.

الدرجات					الساعات			ميكانيكا الكم (1)	٣١١ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L		
10	10	30	0	50	3	0	3	Quantum Mechanics (1)	P311

Equation of motion, conservation laws - Integration of motion equations - Failure of classical mechanics - Origin of the quantum theory, Hydrogen atom - Wave particle dualism, Postulates.

الدرجات					الساعات			النظرية الكهرومغناطيسية والديناميكا الكهربائية	٣١٢ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L		
10	10	30	0	50	3	0	3	Electromagnetic Theory and Electrodynamics	P312

Vector Analysis - Electrostatics, Poisson equation, energy in electric field- Magnetostatics, energy stored in magnetic field, magnetic materials - Solution of the Laplace's equation - Maxwell's equations in electromagnetism.

الدرجات					الساعات			فيزياء احصائية	٣١٣ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L		
10	10	30	0	50	3	0	3	Statistical Physics	P313

Thermodynamics review - Phase space and ensemble average  
Micro-canonical, canonical, and grand canonical ensembles - Partition function and binomial distribution - Classical statistics, Poisson and Gibbs distribution - Quantum statistics, Applications.

الدرجات					الساعات			معمل الفيزياء الحديثة(1)	٣١٥ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L		
10	20	20	50	0	1	3/-	0	Modern Physics Laboratory	P315

12 Experiments in related topics

الدرجات					الساعات			طرق الفيزياء الرياضية	٣١٦ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L		
10	10	30	0	50	3	0		Methods of Mathematical Physics	P316

Vector analysis with applications - Partial differential equations and boundary value problem - Laplace's and Fourier's transforms - Special functions.

الدرجات					الساعات			فيزياء البلازما وتطبيقاتها	٣٣٢ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L		
10	10	30	0	50	3	0		Plasma Physics and its Applications	P332

Motion of charged particles in electric and magnetic fields - Characteristic of Plasma, Aurora zone and Van Allen belt- Plasma interaction with magnetic field - Plasma electron oscillation and ion oscillation - Hydromagnetic waves, Alfven waves - Plasma diagnostic techniques - Plasma applications, Nuclear fusion.

الدرجات						الساعات			الفيزياء النووية (1)	٣٤٢ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	30	0	50	3	0	3	Nuclear Physics (1)	P342	

Rutherford theory of alpha scattering- The classical properties of the nucleus - The constituents of the nucleus, Quark theory - The nuclear binding energy - Nuclear fission and fusion reactions - The natural radioactivity.

Electric and magnetic properties of the nucleus - Vector coupling, Parity - The nuclear forces, Schrodinger`s wave equation of deuteron - Mechanisms of alpha, beta and gamma decay - Neutron reactions and detection - Principles of reactors and accelerators.

الدرجات						الساعات			معمل الفيزياء النووية	٣٤٥ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	20	20	50	0	1	3/-	0	Nuclear Physics Laboratory (1)	P345	

12 Experiments in related topics

الدرجات						الساعات			فيزياء الجوامد(1)	٣٥٣ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	30	0	50	3	0	3	Condensed Matter Physics	P353	

Crystal structure - Reciprocal lattice, X-ray diffraction in crystals - Lattice vibrations and thermal properties - Defects in crystals (point defects and 1-d, 2-d and 3-dimensional defects) - Free electron mode and electric properties - Band theory and Brillion zones - Theory of dielectrics, Ferroelectric crystals - Optical properties - Magnetic properties and applications of ferromagnetic materials.

الدرجات						الساعات			انماء بلورى وخواص فيزيائية للبلورات	٣٥٤ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	30	0	50	3	0	3	Crystal Growth and Properties of Crystals	P 354	

Theories and mechanisms of crystal growth - Phase diagrams and Equilibriums- Methods of crystal growth from solutions, melt and vapor phases - Characterization of single crystals using various techniques - Fine structure and physical properties of single crystals. X-rays, Production & Detection - Review of crystalline Structure, X-ray cameras - Reciprocal space - Models For diffracted intensity - Small-angle scattering of X-rays.

الدرجات						الساعات			معمل فيزياء الجوامد(1)	٣٥٥ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	20	20	50	0	1	3/-	0	Condensed Matter Physics Laboratory (1)	P355	

12 Experiments in related topics

الدرجات						الساعات			الالكترونيات(1)	٣٦١ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	30	0	50	3	0	3	Electronics (1)	P361	

Semiconductor diodes and applications- Bipolar junction transistors - Field-effect transistors - Biasing of transistors, integrated circuits - Operational amplifiers - Feedback amplifiers and oscillators.



الدرجات						الساعات			معمل الكترونييات	٣٦٥ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	20	20	50	0	1	3/-	0	Electronics laboratory (1)	P365	

12 Experiments in related topics

الدرجات						الساعات			فيزياء فلكية	٣٨١ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	30	0	50	3	0	3	Astrophysics	P381	

Historical introduction, special astronomy - Solar and lunar eclipses - Solar system, Active sun - Stars, structure, evolution, formation, properties - Interstellar matter, star clusters, galaxies, cosmology.

الدرجات						الساعات			فيزياء بيئية	٣٨٣ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	30	0	50	3	0	3	Environmental Physics	P383	

Origin and composition of the atmosphere - Charged particles, temperature distribution in the atmosphere - Atmospheric thermodynamics - Radiation transfer and spectrum, absorption and emission - Atmospheric absorption of solar radiation.

الدرجات						الساعات			تحليل رياضي	٤١٩ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	30	0	50	3	-/2	2	Mathematical analysis	M419	

System of real numbers – real sequences – continuous functions – differentiable functions – complex numbers – elementary functions- limits and continuity – complex sequences – complex series – derivatives- complex integral – types of contour – integrals.

الدرجات						الساعات			مقال او بحث	٤٠٠ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	0	0	0	90	2	0	2	Research project or Article	P400	

Research Project/Article

الدرجات						الساعات			ميكانيكا الكم (2)	٤١١ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	30	0	50	3	0	3	Auantum Mechanics (2)	P411	

Schrodinger equation, classical limits - One-dimensional problems - Three-dimensional problems - Complete description of a state - Constants of the motion, Uncertainty principle -Wave packets, Probability current density.

الدرجات						الساعات			نمذجة النظم الفيزيائية	٤١٤ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	30	0	50	3	0	3	Modeling of Physical Systems	P414	

Solving systems of equations - Problems in vector calculus - Fourier series - Differential equations (Ordinary and Partial) - Advanced Graphics (including Animation) - Curve-Fitting & Statistics.

الدرجات						الساعات			٢٢ ف٤
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	فيزياء الحرارة المنخفضة والموصلية الفائقة	
10	10	30	0	50	3	0	3	Low temperature physics and superconductivity	

Production and measurements of low temperatures - Electrical and mechanical properties at low temperatures- Magnetism and specific heat at low temperatures - Superconductors, Normal transition - The energy gap and zero resistance – The BCS Theory – Josephson junction - Introduction to high temperature superconductors - Applications of superconductors.

الدرجات						الساعات			٣٢ ف٤
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	اطياف ذرية وجزيئية	
10	10	30	0	50	3	0	3	Atomic and Molecular spectroscopy	

Bohr theory and spectra of hydrogen atom. Emission and absorption of many electron atoms. Zeeman and Stark effect- Pauli principle- Rotation of diatomic molecules - Vibration of diatomic molecules - Electronic spectra diatomic molecules – Rotational, vibrational and electronic spectra of diatomic molecules – Raman spectroscopy.

الدرجات						الساعات			٤٤ ف٤
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	فيزياء اشعاعية وتلوث اشعاعي ووقاية من الاشعاع	
10	10	30	0	50	3	0	3	Radiation physics , Radiation pollution and safety	

Radiation sources - Interaction of radiation with matter - Radiation detection and detectors - Biological effects of ionizing radiations - Dose meters and survey meters - External and internal hazards of radiation - Storage of radioactive materials.

الدرجات						الساعات			٥١ ف٤
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	فيزياء اشباه الموصلات والاعشبية الرقيقة وتطبيقاتها	
10	10	30	0	50	3	0	3	Physics of semiconductors and thin solid and its applications	

Crystal structure, energy bands - Intrinsic and extrinsic semiconductors, Fermi-Dirac function - Density of carriers, carrier transport, Hall effect - p-n junctions, I-V and C-V characteristics - Characteristics of transistors (BJT, MIS) - Optoelectronic : photodiodes, laser diodes, solar cells. Introduction, Vacuum techniques, Vacuum gauges - Different methods of thin films preparation - Thickness measurements - Characterization of thin films - Thin films applications.

الدرجات						الساعات			٥٣ ف٤
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	الرنين المغناطيسي واطياف موسباور	
10	10	30	0	50	3	0	3	Electron spin resonance Mossbauer spectroscopy	

Paramagnetic resonance - Line width, effect of damping - Fine and hyperfine structure - Electron paramagnetic resonance - Ferromagnetic and anti-ferromagnetic resonance - Nuclear magnetic resonance - Magnetic resonance imaging. Resonance absorption of gamma rays and the Mossbauer effect - Lattice dynamics and phonons - Hyperfine interactions: electric monopole, electric quadrupole interactions and the magnetic dipole interactions - Analysis of Mossbauer spectra, Mossbauer parameters.

الدرجات						الساعات			٥٥ ف٤
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	معمل فيزياء اشباه الموصلات	
10	20	20	50	0	1	3/-	0	Physics of semiconductors laboratory	

12 Experiments in related topics

الدرجات						الساعات			المواد الامورفية والزجاجية	٤٥٧ ف
oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		
10	10	30	0	50		3	0	3	Amorphous materials and glasses	P457

Preparation of amorphous materials- Glass transition- Structure of glasses, short and medium range order- Structure models- Lattice vibrations, thermal excitation- Atomic motion and transport properties- Defects- Applications of amorphous materials: optical, magnetic, electronic and electrochemical applications.

الدرجات						الساعات			علوم المواد النانوية وتطبيقاتها	٤٥٨ ف
oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		
10	10	30	0	50		3	0	3	Nanomaterial science and its applications	P458

Fabrication methods - Factors affect the particle shape - Characterization techniques - Electrical, magnetic and optical properties - Nanotechnology for Bio-materials and tissues - Nanoparticulates applications.

الدرجات						الساعات			قياسات فيزيائية باستخدام الحاسب (1)	٤٦٢ ف
oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		
10	10	30	0	50		3	0	3	Computational physics and computer interfacing	P462

Polynomial interpolation, Error function - Lagrange and Hermit interpolation, Airy pattern - Aitken and Chebyshev interpolation  
Interpolation techniques - Theory of finite differences, Types of differences - Inverse interpolation and predictions - Divided differences and derivative estimation.

الدرجات						الساعات			فيزياء الليزر وتطبيقاته	٤٧٢ ف
oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		
10	10	30	0	50		3	0	3	Laser physics and its applications	P472

Introduction to laser physics and its characteristics - Theory of laser - Types of lasers - Applications of Lasers in different fields.

الدرجات						الساعات			موضوعات مختارة في الفيزياء (1)	٤٩١ ف
oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		
10	10	30	0	50		3	0	3	Special topics in physics (1)	P491

The title and topics are to be determined by the Physics Department

الدرجات						الساعات			موضوعات مختارة في الفيزياء (2)	٤٩٢ ف
oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		
10	10	30	0	50		3	0		Special topics in physics (2)	P492

The title and topics are to be determined by the Physics Department