كلـية العـلوم

محتـويات مقـــــررات برنامج
Courses' Content
الفيزياء والالكترونيات
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كلية العلوم

لغة انجليزية(1)	٠١٥ م ج
English Language (1)	**UR015**

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

1- Listening & Speaking:
A- (Listening): This part of the course aims at training the students for listening and understanding udio-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.

لغة انجليزية(2)	٠٢٠ م ج
English Language (2)	**UR020**

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

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 traget 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, escially after studying prefixes & suffixes as mentioned above.

قضايا مجتمعية	٠٥٠ م ج
Societal Issnes	**UR050**

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

ادارة اعمال	١١ م ج
Management	**UR011**

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

تاريخ العلوم	٠١٢م.ج
History of Science	**UR012**

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

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.

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Means of honoring scientists

١٣ م ج	التغذية الصحية
UR013	Healthy Feeding

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

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

٠١٤م ج	التفكير العلمى
UR014	Scientific Thinking

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

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

١٦ .م ج	لغة عربية
UR016	Arabic Language

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

١٠٠رك	الحاسب الالى
MC100	Computer Sciences

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

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.

١٠٠ر	رياضيات عامة (1)
M100	Mathematics (1)

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

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

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Approximate solutions of non-linear equations.

	الدرجات				الساعات			رياضيات عامة (2)	١٠٥ر
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	**Mathematics (2)**	**M105**
10	10	30	0	50	3	-/2	2		

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.

	الدرجات				الساعات			فيزياء عامة (1)	١٠٠ ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	**Physics (1)**	**P100**
10	10	10	20	50	3	3/-	2		

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.

	الدرجات				الساعات			فيزياء عامة (2)	١٠٥ف
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	**Physics (2)**	**P105**
10	10	10	20	50	3	3/-	2		

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.

	الدرجات				الساعات			كيمياء عامة (1)	١٠٠ك
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	**Chemistry (1)**	**C100**
10	10	10	20	50	3	3/-	2		

(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)

	الدرجات				الساعات			كيمياء عامة (2)	١٠٥ك
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	**Chemistry (2)**	**C105**
10	10	10	20	50	3	3/-	2		

(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)

	الدرجات				الساعات			اساسيات الجيولوجيا	١٠٠ج
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	**Principles of Geology**	**G100**
10	10	10	20	50	3	3/-	2		

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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

ح ١٠٠	حيوان عام
Z100	**General Zoology**

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

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

ن ١٠٠	نبات عام
B100	**General Botany**

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

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

F٣٠٠	اخلاقيات وآداب المهنه والسلامة المهنية
F300	**Scientific Ethics&Safety**

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

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.

ر ٢٢٣	رياضيات متقطعة
M223	**Discrete Mathematics**

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

Sets – Relations – Equivalence relations – Mappings – Binary operations - Counting – Rules of inference – Graph theory – Graphs and multigraphs – Planar graphs – Colorations, Trees – Boolean Algebra – Duality – Basic theorems – logic Gates and Circuits.

٢٥١رك	البرمجة الشيئية
MC251	**Object-oriented Programming**

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

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

٢٥٢رك	هياكل بيانات
MC252	**Data Structure**

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

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Data representation – arrays and matrices – lists stacks and queues – hashing – binary trees, balanced and B-trees – splay trees and tree traversals using stacks – expression trees – expressions and conversions – graphs – graph algorithms – minimum-cost spanning trees – inheritance – exceptions, interface and design by contract – basic design patterns and reuse.

الدرجات					الساعات				
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	فيزياء الاهتزازات والموجات	٢١٢ف
10	10	30	0	50	3	0	3	**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	فيزياء حديثة	٢١٥ف
10	10	30	0	50	3	0	3	**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	ديناميكا حرارية	٢٢٣ف
10	10	30	0	50	3	0	3	**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	فيزياء الفلزات والسبائك والسيراميكات	٢٥٦ف
10	10	30	0	50	3	0	3	**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	كهربية ومغناطيسية وتيار متردد	٢٦١ ف
10	10	30	0	50	3	0	3	**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	معمل كهربية ومغناطيسية وتيار متردد	٢٦٥ف
10	20	20	50	0	1	3/-	0	**Electricity and AC Laboratory**	P265

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12 Experiments in related topics

	الدرجات				الساعات					
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	٢٧١ ف	بصريات فيزيائية والياف بصرية	
10	10	30	0	50	3	0	3	**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	٢٧٥ف	معمل ديناميكا حرارية وبصريات فيزيائية	
10	20	20	50	0	1	3/-	0	**Thermodynamics and Phyiscal Optics lab Laboratory**	**P275**	

12 Experiments in related topics

	الدرجات				الساعات					
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	٢٢٨ E++	تصميم دوائر رقمية	
10	10	10	20	50	5	2/-	4	**Digital Logic Design**	**E228**	

	الدرجات				الساعات					
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	٣٥١ رك	نظم تشغيل	
10	10	10	20	50	3	2/-	2	**Operating systems**	**MC351**	

Introduction to function, design, and implementation of operating system – co-ordination and synchronization processes – scheduling and dispatch – physical and virtual memory organization – paging and segmentation – device management – file systems – security and protection – communications and networking – distributed systems.

	الدرجات				الساعات					
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	٣٥٤رك	شبكات الحاسب	
10	10	10	20	50	3	2/-	2	**Computer Networks**	**MC354**	

Network architectures and protocols, placing emphasis on protocols used in the Internet. Specific topics include application layer protocols, network programming, transport protocols, routing, multicast; data link layer issues, multimedia networking, network security, and network management. Simulation of the network/transport layer functions, routing, congestion control, an Ethernet controller, and applications using TCP/IP or remote procedure calls. Intended audience: computer science and computer engineering majors.

	الدرجات				الساعات					
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	٣٦١رك	الدوائر المنطقية	
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.

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	الدرجات					الساعات			نظرية لغات البرمجة	٣٦٤رك
oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		
10	10	10	20	50		3	2/-	2	**Programming Languages Theory**	**MC364**

Inductive Definitions - Levels of Syntax - Binding and Scope - Static and Dynamic Semantics - Functional Core Language - Recursion, Iteration, Fixed Points - Products and Records - Sums and Variants - Polymorphism - Data Abstraction - Recursive Types – Subtyping

	الدرجات					الساعات			معمل الفيزياء الحديثة(1)	٣١٥ف
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			فيزياء البلازما وتطبيقاتها	٢٣٢ف
oral	ACT	Mid_T	Prac	Wr.		CH	P/T			
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			فيزياء الجوامد(1)	٣٥٣ف
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			معمل فيزياء الجوامد(1)	٣٥٥ف
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			الكترونيات(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 الكترونيات	٣٦٥ف
oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		
10	20	20	50	0		1	3/-	0	**Electronics laboratory (1)**	**P365**

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oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		٣٨٣ ف	فيزياء بيئية
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					
oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		EP٣٢٥	الكترونيات صناعية
10	10	10	20	50		5	2/-	4		**Industrial Electronics**	**EP325**

	الدرجات					الساعات					
oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		EE ٣٢٦	دوائر الكترونيه (1)
10	10	10	20	50		5	2/-			**Electronic Circuits (1)**	**EE326**

	الدرجات					الساعات					
oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		EE٣٢٢	الكترونيات (3)
10	10	10	20	50		5	2/-	4		**Electronics (3)**	**EE322**

	الدرجات					الساعات					
oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		٤٥٢رك	حسابات موزعه
10	10	30	0	50		2	0	2		**Distributed Computing**	**MC452**

Introduction - Parallel and Distributed Architectures - Parallel Algorithm Design - Message-Passing Programming - Shared-Memory Programming - Performance Analysis – Applications

	الدرجات					الساعات					
oral	ACT	Mid_T	Prac	Wr.		CH	P/T	L		٤٥٣رك	امن الحاسب
10	10	30	0	50		2	0	2		**Computer Security**	**MC453**

Overview , characteristics of computer intrusion , points of security vulnerability, methods of defense, Basic encryption and decryption: different types of ciphers, characteristic of good ciphers ,Security involving programs, database security, reliability and integrity , sensitive data , the inference problem, multilevel data security.

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

Research Project/Article

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الدرجات					الساعات				
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	فيزياء الحرارة المنخفضة والموصلية الفائقة	٤٢٢ف
10	10	30	0	50	3	0	3	Low temperature physics and superconductivty	P422

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				
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	فيزياء اشباه الموصلات والاغشية الرقيقة وتطبيقاتها	٤٥١ف
10	10	30	0	50	3	0	3	Physics of semiconductors and thin solid and its applications	P451

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				
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	الرنين المغناطيسى واطياف موسباور	٤٥٣ ف
10	10	30	0	50	3	0	3	Electron spin resonance Mossbauer spectroscopy	P453

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 quadrapole interactions and the magnetic dipole interactions - Analysis of Mossbauer spectra, Mossbauer parameters.

الدرجات					الساعات				
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	معمل فيزياء اشباه الموصلات	٤٥٥ف
10	20	20	50	0	1	3/-	0	Physics of semiconductors laboratory	P455

12 Experiments in related topics

الدرجات					الساعات				
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	معمل الكترونيات (2)	٤٦١ف
10	20	20	50	0	1	3/-	0	Electronics Laboratory (1)	P461

12 Experiments in related topics

الدرجات					الساعات				
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L	قياسات فيزيائية باستخدام الحاسب (1)	٤٦٢ف
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.

محتـويات مقــــررات برنامج
Courses' Content
الفيزياء والالكترونيات
...vsics and Electroni...

كلـية العــلوم

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

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

	الدرجات				الساعات			P491	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)**		

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

	الدرجات				الساعات			EE٤٢٢	دوائر الكترونية (2)	
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	10	20	50	5	2/-	4	**Electronic Circuits (2)**		