

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.

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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

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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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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

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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	م ١٠٠ ارك
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.

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

رياضيات عامة (1)	م ١٠٠ ارك
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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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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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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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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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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10	10	30	0	50	3	0	3

احصاء حيوى	رأ ٢٤١
Biostatistics	MS241

Some basic probability concepts – Some important sampling distributions – Estimation Hypothesis testing – Analysis of variance - Regression and correlation – Multiple regression and correlation – Goodness of fit test.

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

كيمياء عضوية لغير طلاب الكيمياء	ك ٢١١
Organic Chemistry for non Chemistry Students	C211

Chemistry of Aliphatic Compounds – Chemistry of Selected Aromatic Compounds (Practical :Selected practical experiments )

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

تصنيف نباتات زهرية	ن ٢٣٢
Taxonomy of Flowering Plants	B232

Introduction – flower structure – inflorescences – fruits – systems of classification - study of representative families of angiosperms.

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

ميكروبيولوجيا عامة	ح ٢٩١
General Microbiology	B291

Taxonomy of Prokaryotes – benefit and harmful effect of bacteria – bacterial cell structure – growth of bacteria – general characters of fungi – Fungal classifications – Myxomycota, Mastigomycota and Zygomycota

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

علم الخلية	ح ٢١٠
Cytology	Z210

The cell theory. Membranous organelles. Non-membranous organelles. The cell inclusions. The nucleus. Cell division. The phases of mitosis. Meiosis. DNA & RNA synthesis.

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

علم الانسجة	ح ٢١٢
Histology	Z212

Detailed study of different types of animal tissues. Histological study of different types of animal systems. Macroscopical and microscopical views of a lesion. Cellular damage. Causes of cellular damage. Responses to cellular damage. Diseases of organ systems.

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

لافقاريات (1)	ح ٢٢٠
Invertebrates (I)	Z220

Explanation of the classification of animal kingdom into the major Phyla. Characters of the major phyla: Protozoa, Porifera, Cnidaria, Platyhelminthes, Nematoda, Annelida and their classes.

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

لافقاريات (2)	ح ٢٢٢
Invertebrates (II)	Z222

Classification of the major Phyla into Classes and the characters of each Class. Explanation of the characters of the major phyla: Arthropoda, Mollusca, and Echinodermata.

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

حشرات عامة	ح ٢٤٠
General Entomology	Z240

I- External Insect Morphology. II- Internal Anatomy. III- Molting and Metamorphosis. Introduction to insect classification.

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

مورفولوجيا الحشرات	ح ٢٤٢
Insect Morphology	Z242

External Morphology in different insect orders. Arthropodization - The Integument. - The head (Segmentation and evolution, primitive insect head, general pterygote head, appendages) – The thorax (General structure, appendages, mechanisms of flight). – The abdomen and external genitalia.

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

أساسيات الوراثة ٢١٥ ز

Genetic Basis A215

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

فيزياء حيوية ٣٢٣ ف

Biophysics P323

Studying DNA and biopolymers - Cell membranes and membrane potentials - Electrical activity of nerve cells - Fundamentals of measuring circuits and systems - Temperature and pressure measurements - Measuring cell potentials.

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

كيمياء تحليلية بيئية ٣٤٣ ك

Environmental Analytical Chemistry C343

Environmental Sampling – Analysis Using Modern Instrumental Techniques – Chemistry of Natural Water – Water Pollution – Waste Water Treatment – Environmental Toxicology – Analysis of Selected Contaminants (Heavy Metals and Organometallic compounds).

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	10	20	50	2	3/-	1

بيولوجية جزيئية ٣١١ ح

Molecular Biology Z 311

DNA structure - Genome organization in prokaryotic and eukaryotic cell - DNA replication and repair - Translation - Gene expression in eukaryotes Recombinant DNA techniques - Postranslational protein modification.

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

بيولوجية الخلية ٣١٢ ح

Cell Biology Z 312

Cell growth and proliferation. The cell cycle Apoptosis and its mechanism. Cellular aging and related terms.

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

كيمياء الأنسجة ٣١٦ ح

Histochemistry Z 316

Study of chemical components of carbohydrates, proteins, lipids, nucleic acids, etc. in the cells and tissues including methods for their detection. Detecting methods of some enzymes in animal tissues.

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

تقنية مجهرية ٣١٧ ح

Microscopical Techniques Z 317

Methods and tools used in the study of the cell and tissues of animals. Different types of microscopes. Principles of electron microscopes. Resolution of electron microscopes. Specimen preparation for transmission electron microscope. Specimen preparation for scanning electron microscope. Application of electron microscopes.



الدرجات						الساعات			تصنيف الحشرات	ح ٣٤٠
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	10	20	50	3	2/-	2	Insect Taxonomy	Z 340	

History of insect taxonomy. - Importance of insect taxonomy. - Modern taxonomy (origin and evolution). taxonomic categories. - The international rules of insect nomenclature. - Vernacular name. - Description of specimen - Classification and phylogeny of insects. -Types of references. - How to present taxonomic data in a scientific paper.

الدرجات						الساعات			تصنيف الحشرات	ح ٣٤١
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	10	20	50	3	2/-	2	Insect Comparative Anatomy	Z 341	

Studying the following systems in different insect orders: digestive system- Respiratory system- Circulatory system- Excretory system- Muscular System- Nervous system and sensory structures- and Reproductive system.

الدرجات						الساعات			تصنيف الحشرات الاقتصادية	ح ٣٤٢
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	10	20	50	3	2/-	2	Economic Entomology	Z 342	

Introduction of economic entomology. Beneficial and harmful insects. Types of insect pests. Pests of cultivated crops, vegetables and fruits. Pests of household material (carpet, cloth, wood, paper, etc.).

الدرجات						الساعات			تصنيف الحشرات الاقتصادية (1)	ح ٣٤٣
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	10	20	50	3	3/-	2	Insect Physiology (1)	Z 343	

Hormonal control of the integument- Physiology of metamorphosis and growth- Digestion- Respiration- Excretion- Circulatory system- Reproduction.

الدرجات						الساعات			تصنيف الحشرات الطبية	ح ٣٤٤
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	10	20	50	3	2/-	2	Medical Entomology	Z 344	

Diseases and harms caused by insects. Insects as vectors for protozoa and parasitic worms (Their mode of infection and Life cycles) – Protection and control. Mechanical, physical, and chemical injuries. Microbial and non-microbial diseases. -Genetic diseases. Epidemic of insect diseases.

الدرجات						الساعات			العلاقة بين الحشرات والنبات	ح ٣٤٦
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	10	20	50	3	2/-	2	Insect -Plant Interactions	Z 346	

Insects as pollinators, seed dispersers, sources of plant food, defense providers- Roles of insects in recycling of dead animals, dung, and dead plants. Insects as pests for plants and reaction of plants to insect herbivory. Chemical and physical signals that shape the relation between insects and plants. Phytochemicals and secondary metabolites produced by plants due to insect attacks. Plant-derived insecticides.

الدرجات						الساعات			تصنيف الحشرات الطفيلية	ح ٣٥١
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	10	20	50	3	2/-	2	Parasitic Insects	Z 351	

Definition and types of parasitism. Insects as parasites of both vertebrate and invertebrate animals. Insects as hosts for other parasites. Order Hymenoptera as the major group of parasites on insect hosts. Egg, larval,

and Pupal parasitoids and their hosts Parasitoids of adult insects. Parasites of social insects: trophic parasitism; slave making, etc.

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

ح ٣٥٢	تصميم التجارب وتربية الحشرات
Z 352	Experiment Design and Insect Rearing

Basic epistemological concepts. Inductive and deductive methods of science. Teleology and phenomenology in science. Proximate and ultimate causation. Difference between descriptive and experimental scientific work. Hypothesis and theory. What is a scientific experiment? Precautions of experiment: controlling variables, elimination of error sources, avoiding misleading or insufficient techniques. Choosing appropriate statistical tests. Basic features of statistical tests. Differences between Type I and Type II errors. Single comparisons and multiple comparisons. Limits of extrapolation depending on type of empirical data. Phrasing the conclusions of experimental results.

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

ح ٣٥٣	اجنة الحشرات
Z 353	Insect Embryology

The egg structure: Cytoplasm, vitelline envelop, and chorion. Egg respiration– Water regulation. Embryology: Cleavage and blastoderm formation. Vitellophages– Germ band formation– Determination of the body axes and segmentation. Gastrulation– Formation of embryonic membranes– Movements of the embryo- Dorsal closure– Ectodermal structures. Mesoderm and body cavity. Alimentary canal. Reproductive system. Viviparity, Polyembryony, Parthenogenesis, Pedogenesis. Postembryonic Development: Hatching– Larval development– Metamorphosis– Control of postembryonic development. Polyphenism– Diapause.

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

ح ٣٥٤	الحشرات المائية
Z 354	Aquatic Insects

Introduction. Origin of aquatic insects, Aquatic Insect Orders, Key to aquatic insect orders, Habitats and communities (Permanent habitats, temporary habitats, Man-made habitats), life history and habitats.

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10	10	10	20	50	3	2/-	2

ز ٣١٠	الوراثة الجزيئية
A310	Molecular Genetics

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

ك ٤٦٠	كيمياء تحليلية لطلاب البيولوجي
C 460	Analytical Chemistry for Biology Students

Acid –Base Titration, Precipitation Titrations, Complexometric Titrations, Redox Titration, Gravimetric Analysis, Potentiometric Titrations, Ultraviolet/Visible Spectrophotometry, Atomic Spectrometry, Conductometry and Modern Voltammetric techniques, Analytical Separations, HPLC, Electrophoresis (Practical: Selected practical experiments )

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	0	0	0	90	2	0	2

ح ٤٠٠	مقال او بحث
Z 400	Research Project or Article

A short research or an essay project must be prepared as a year-extended course.



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

ح ٤٤١ فسيولوجيا الحشرات (2)

Insect Physiology (2) Z 441

Nervous and endocrine system - Insect sense organs - Pheromones - Muscular system.

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

ح ٤٤٢ اساسيات مكافحة الحشرات

Fundamentals of Insect Control Z 442

A- History and principles of insect control, Pests and pest harmful. – Types of pest control.  
B- Chemical control: Pesticides Discovery, Classification of insecticides, Problems generated due to overuse of pesticides, Resistance against pesticides.  
C- Other methods of pest control: Synergistics and pesticide combinations, Insect growth regulators, Insect development inhibitors, Ovicides, Antifeedants, Autocidal control, Behavior-based insect control, Integrated Pest Management (IPM).

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10	10	10	20	50	3	2/-	2

ح ٤٤٣ بيئة الحشرات

Insect Ecology Z 443

A- An overview of insect ecology: introduction to insect ecology, fossil history and insect evolution, habits of insects, the number of insect species richness, variations in species number, abundance, insects and humans. B- Insects and Climate: Temperature, photoperiod, rainfall, wind, climate change. C- Insect Herbivores: Trouble with plant as food, feeding strategies of herbivorous insects, plant defenses, overcompensation. D- Insects in Ecosystems: fundamentals of ecosystem, Insects and the terrestrial carbon cycle, leaf-shredding insects and stream ecosystems.

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

ح ٤٤٤ سلوك الحشرات

Insect Behaviour Z 444

Origins of the science of insect behavior - Releasers and supernormal releasers. - Insect learning. - Orientation and navigation. – Insect communication. - The honeybee language. - Protective behavior in insects. - Mimicry and its varieties. - Insect rhythms. - The social life of insects. Kin selection and the evolution of insect sociality.

الدرجات					الساعات		
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L
10	10	10	20	50	3	4/-	1

ح ٤٤٦ تدريبات حقلية متخصصة

Specialized Field Training Z 446

Factors affecting insects in their natural habitat. - Requirements of field work. - Observation of insect life and behavior. - Types of insect traps. - Collecting insects from different habitats. Preservation of insect specimens. - Designing field experiments. - monitoring of existing insect population; introducing an insect into the field for experiment; gathering and analysis of field data.

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

ح ٤٤٧ مناعة الحشرات

Insect Immunity Z 447

A- Cellular Immunity: Insect hemocytes involved in cellular defense reactions – Phagocytosis – Cellular encapsulation – Humoral encapsulation – Nodule formation – Phenoloxidases and their possible role in cellular and humoral encapsulation – Resistance to cellular defense reactions. B- Humoral Immunity: Factors normally present in insect hemolymph – Factors inducible upon infection – Resistance to humoral immune

reactions.

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

ح ٤٥١ الاكاروسات

Acarology Z 451

Historical introduction – Collection – Preparation for Study – External Morphology – Biology and life cycle – Classification – Distribution, abundance, and environmental variable – Agricultural importance - Medical and veterinary importance of house-dust mites and ticks – Treatment and control.

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

ح ٤٥٢ موضوعات مختارة في الحشرات (1)

Selected Topics in Entomology (1) Z 452

To be determined by the department

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

ح ٤٥٣ آفات الحبوب المخزونة

Stored Grain pests Z 453

The loss in stored grains and legumes and its causes. - Factors inducing spread of stored product insects. - Damage caused by the infestation with stored product insects. - Grouping of stored product insects according to feeding habits and systematic position. - Orders Lepidoptera (moths) and Coleoptera (weevils and beetles), example stages that cause the damage, and methods for control. - Hygienic methods for storage of grains and legumes. - Methods for the assessment of the levels of infestation with stored product insects. - Precautions required for reduction/prevention the infestation with stored product insects. - Control measures of the stored product insect pests.

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

ح ٤٥٤ اسس فعل المبيدات الحشرية

Principles of Insecticide Action Z 454

Toxicity and hazards of pesticides - Mode of insecticides action - Insecticides with novel mode of action - Principles of pesticides' metabolism. Insect resistance to insecticides.

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

ح ٤٥٦ الحياة الاجتماعية للحشرات

Insect Sociobiology Z 456

Evolutionary roots of insect sociality. Types of insect societies. Structure of social insect colonies. Caste formation and differentiation. Division of labor in insect colonies. Habits and habitats of insect colonies. Social insects belonging to orders other than Hymenoptera and Isoptera.

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

ح ٤٥٧ موضوعات مختارة في علم الحشرات (2)

Selected Topics of Entomology (2) Z 457

To be determined by the department

الدرجات						الساعات			البيئة الحسية للحشرات	ح ٤٥٨
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	30	0	50	1	0	1	Sensory Ecology of Insects	Z 458	

Tactile receptors and their importance. Chemoreceptors (taste and olfaction sensilla) and their role in insect communication. Photoreceptors (ocelli and apposition and superposition eyes). Sound production and sound receptor apparatuses. Primary processing of sensory information. The role of different sensory modalities in the shaping of insect behavior.

الدرجات						الساعات			المكافحة الحيوية	ح ٤٥٩
oral	ACT	Mid_T	Prac	Wr.	CH	P/T	L			
10	10	10	20	50	3	2/-	2	Biological Control	Z 459	

The scope of biological control, Role of biological control in IPM: A- The natural enemies: Predators, Parasites. – Utilization: Importation. Augmentation – Some outstanding case histories B- Fungal control C- Viral control.