

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

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| 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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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L |
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| 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 |
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| قضايا مجتمعية | م ٥٠ ج |
| Societal Issues | UR050 |

| الدرجات | | | | | الساعات | | |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L |
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| ادارة اعمال | م ١١ ج |
| Management | UR011 |

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

١٣ م ج التغذية الصحية

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)

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

١٤ م ج التفكير العلمي

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 |

١٦ م ج لغة عربية

Arabic Language UR016

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

١٠٠ ارك الحاسب الالى

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

١٠٠ ا ر رياضيات عامة (1)

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.

| الدرجات | | | | | الساعات | | |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L |
| 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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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L |
| 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.

| الدرجات | | | | | الساعات | | |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L |
| 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.

| الدرجات | | | | | الساعات | | |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L |
| 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)

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

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)

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

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 |

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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

| الدرجات | | | | | الساعات | | |
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| 10 | 10 | 10 | 20 | 50 | 3 | 3/- | 2 |

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| 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

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

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

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

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| كيمياء فيزيائية وغير عضوية | ك ٢٥٠ |
| Physical and Inorganic Chemistry | C250 |

General Properties of the Main Group Elements (S, P- block elements) (The First Group to Seventh Group) – First and Second Law of Thermodynamics (Entropy and Enthalpy and Their Change With Temperature – Chemical Potential).

(Practical: Selected practical experiments)

| الدرجات | | | | | | الساعات | | | بيولوجيا جزئية | ٢١٢ ن |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | | |
| 10 | 10 | 30 | 0 | 50 | 2 | 0 | 2 | Molecular Biology | B212 | |

Introduction – structure and function of DNA & RNA – gene organization, cloning, structure, expression & regulation – amino acids and protein structure – expression of foreign proteins - methods for protein detection

| الدرجات | | | | | | الساعات | | | مورفولوجيا وتشريح النبات | ٢١١ ن |
|---------|-----|-------|------|-----|----|---------|---|------------------------------|--------------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Plant Morphology and Anatomy | B221 | |

Seeds & seed germination – morphological structures of plant organs – modification – meristematic & permanent tissues – anatomical structures of plant organs – secondary thickening – ecological groups.

| الدرجات | | | | | | الساعات | | | تصنيف نباتات زهرية | ٢٣٢ ن |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Taxonomy of Flowering Plants | B232 | |

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

| الدرجات | | | | | | الساعات | | | علم البيئة النباتية | ٢٤١ ن |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Plant Ecology | B241 | |

Ecosystems and energy flow – ecological factors: climatic, edaphic & biotic factors – ecological plant groups: Hydrophytes, Xerophytes, Halophytes & Mesophytes

| الدرجات | | | | | | الساعات | | | فسيولوجيا النبات | ٢٥١ ن |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Plant Physiology | B251 | |

Solutions – plant water relations – enzymes – photosynthesis – respiration – fat metabolism – nitrogen metabolism – hormones

| الدرجات | | | | | | الساعات | | | تصنيف فطريات(1) | ٢٦٢ ن |
|---------|-----|-------|------|-----|----|---------|---|-------------------------|-----------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Systematic Mycology (1) | B262 | |

General Characters of fungi – Fungal classifications – characteristics, occurrence, somatic structure, reproduction, classification, economic importance, representatives species and life cycles of Divisions: Myxomycota, Mastigomycota and Zygomycota

| الدرجات | | | | | | الساعات | | | علم البكتريا | ٢٧١ ن |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Bacteriology | B271 | |

Dyes and bacterial staining – ultra structure of bacterial cell – bacterial nutrition, growth and population – control of bacterial growth – important groups of bacteria – genetic recombination in bacteria – regulatory mechanisms of Gene expression enzymes in bacteria – bacteria and environment .

| الدرجات | | | | | الساعات | | | علم الطحالب | ٢٧٣ ن |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Phycology | B273 |

Introduction – taxonomic criteria of algae – representative examples of algae : [habitats, life cycles & evolutionary relationships].

| الدرجات | | | | | الساعات | | | علم الفيروسات | ٢٨١ ن |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Virology | B281 |

Historic view – definition – origin – characteristics of viruses – nomenclature & classification – composition & structure - effects of Viruses on their hosts – transmission – pathogens confused with viruses – ways of control.

| الدرجات | | | | | الساعات | | | حشرات عامة | ٢٤٠ ح |
|---------|-----|-------|------|-----|---------|-----|---|--------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | General Entomology | Z240 |

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

| الدرجات | | | | | الساعات | | | أساسيات الوراثة | ٢١٥ ز |
|---------|-----|-------|------|-----|---------|-----|---|-----------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Genetic Basis | A215 |

| الدرجات | | | | | الساعات | | | حزم البرامج الرياضية والاحصائية | ٣٠٠ رك |
|---------|-----|-------|------|-----|---------|-----|---|---------------------------------------|--------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Mathematical and Statistical Packages | MC300 |

Using the mathematical and statistical packages (Matlab, Mathematica, Min Tab, SPSS, ...etc) for matrices – Functions – Graphics – Data Fitting – Applied Statistics

| الدرجات | | | | | الساعات | | | فيزياء حيوية | ٣٢٣ ف |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 30 | 0 | 50 | 3 | 0 | 3 | 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 | | | علم الخلية النباتية | ٣٢٣ ن |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 2 | 2/- | 1 | Plant Cytology | B323 |

Cell wall – cell membrane – cytoplasm – Golgi apparatus – mitochondria & enzyme system – plastids – ribosomes – nucleus – chromosomes.

| الدرجات | | | | | الساعات | | | ن | بيولوجيا فطريات المياه |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | | Biology of Aquatic Fungi |
| | | | | | | | | | B361 |

Aquatic microbial communities – aquatic habitats – biotic & abiotic factors, populations and periodicity – pollution – role, identity and properties of aquatic fungi associated with fish & shellfish – improvement of water quality – biodegradation of pollutants in aquatic environments – symbioses.

| الدرجات | | | | | الساعات | | | ن | تصنيف فطريات (2) |
|---------|-----|-------|------|-----|---------|-----|---|---|-------------------------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | | Systematic Mycology (2) |
| | | | | | | | | | B362 |

General characteristics, occurrence, somatic structure, reproduction, economic importance, representative species & life cycles of Ascomycota, Basidiomycota and Deuteromycota

| الدرجات | | | | | الساعات | | | ن | فسيولوجيا الفطريات |
|---------|-----|-------|------|-----|---------|-----|---|---|---------------------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | | Physiology of Fungi |
| | | | | | | | | | B363 |

Chemical composition of fungal cell – cultivation and preservation of fungi – phases and measuring fungal growth – factors affecting fungal growth – primary & secondary metabolism in fungi – metabolites .

| الدرجات | | | | | الساعات | | | ن | فطريات ممرضة للنبات |
|---------|-----|-------|------|-----|---------|-----|---|---|------------------------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | | Plant Pathogenic Fungi |
| | | | | | | | | | B364 |

Symptoms of plant diseases – blights of seedlings, rots of the roots, vascular wilt diseases, fungal spots and blights of foliage – Downy mildew, Powdery mildews, rusts diseases and smuts fungi and plant diseases they cause.

| الدرجات | | | | | الساعات | | | ن | علاقة العائل بالمضيف |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 30 | 0 | 50 | 1 | 0 | 1 | | Host-parasite Relationships |
| | | | | | | | | | B366 |

Disease cycle – phenomenon of infection – penetration of pathogen – effect of infection on physiology of the host - defence mechanisms in plants.

| الدرجات | | | | | الساعات | | | ن | بيئة طحالب |
|---------|-----|-------|------|-----|---------|-----|---|---|------------------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | | Ecology of Algae |
| | | | | | | | | | B374 |

Algal distribution – types of algae – effect of grazing on algae –factors affecting algal growth – nutrition of algae – Phytoplankton – harmful effects of Algae – role of algae in purification of waste water – economic importance of algae.

| الدرجات | | | | | الساعات | | | ن | علم فيروسات متقدم |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 2 | 2/- | 1 | | Advanced Virology |
| | | | | | | | | | B381 |

Host-virus relationship – ecology and Epidemiology – Virus replication strategy – resistance to viral infection – techniques in virology.

| الدرجات | | | | | الساعات | | | ايض ميكروبي | ٣٩٢ ن |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Microbial Metabolism | B392 |

Fungi metabolism (carbon, nitrogen & sulfur metabolism – macromolecular synthesis) – Bacterial metabolism (energy-generating metabolism – respiration – autotrophic metabolism – energy-yielding pathways and biosynthesis – Prokaryotic metabolism – macromolecular synthesis in bacteria).

| الدرجات | | | | | الساعات | | | سموم ميكروبية | ٣٩٣ ن |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Microbial Toxins | B393 |

Bacterial toxins (proteinaceous and non-proteinaceous toxins) – Phycotoxins (freshwater & marine algal toxins) – Mycotoxins (fungal toxins, factors affecting production, effect on health, biosynthesis & control of mycotoxins)

| الدرجات | | | | | الساعات | | | انزيمات ميكروبية | ٣٩٤ ن |
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| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Microbial Enzymes | B394 |

Enzymes as biological catalysts – chemical nature, classification and nomenclature of enzymes – factors affecting enzyme activities – enzymes and metabolic regulation - applications of enzymes - enzymes production, purification and detection.

| الدرجات | | | | | الساعات | | | ميكروبيولوجيا صناعية | ٣٩٦ ن |
|---------|-----|-------|------|-----|---------|-----|---|-------------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Industrial Microbiology | B396 |

Regulation of microbial growth – screening techniques – fermentation – yeast, alcohols, glycerol & organic acids bioproduction – steroids biotransformations – antibiotics .

| الدرجات | | | | | الساعات | | | كائنات دقيقة ممرضة | ٣٩٧ ن |
|---------|-----|-------|------|-----|---------|-----|---|-------------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Pathogenic Microbiology | B397 |

Introduction on human and animal microbial diseases – Microorganisms and environment- Normal microbial flora of human body – Role of resident flora – Characteristics features of pathogenic microorganisms- Terminology of microbial diseases- Microbe & Host interaction - Microbial cell structures in relation to microbial infection and virulence - Portal of microbial entry – Fungal diseases (Types, Examples and Causatives) and Mycotoxicosis - Bacterial diseases (Types, Examples and Causatives)- Diseases caused by Viruses, Rickettsiae, Mycoplasma, and Prions.

| الدرجات | | | | | الساعات | | | علم الأوليات والطفيليات | ٣٢٤ ح |
|---------|-----|-------|------|-----|---------|-----|---|-------------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Protozoa & Parasities | Z324 |

Characters and classification of free-living and parasitic Protozoa. Principles of parasitology. Introduction to parasitism history and evolution of parasitism, types of parasitism; host-parasite relationships. Parasitic Protozoa, trematodes, cestodes, nematodes and ectoparasites.

| الدرجات | | | | | الساعات | | | تصميم تجارب | ٣١٦ ز |
|---------|-----|-------|------|-----|---------|-----|---|-----------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Design of Experiments | A316 |

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| الدرجات | | | | | الساعات | | | مناعة | ٣١٨ ط |
|---------|-----|-------|------|-----|---------|-----|---|------------|--------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Immunology | MED318 |

| الدرجات | | | | | الساعات | | | كيمياء تحليلية لطلاب البيولوجي | ٤٦٠ ك |
|---------|-----|-------|------|-----|---------|-----|---|---|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 3/- | 2 | Analytical Chemistry for Biology Students | C 460 |

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 | | | مقال او بحث | ٤٠٠ ن |
|---------|-----|-------|------|-----|---------|-----|---|----------------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 0 | 0 | 0 | 90 | 2 | 0 | 2 | Research Projector Article | B400 |

| الدرجات | | | | | الساعات | | | تحليلات قياسية | ٤٥٣ ن |
|---------|-----|-------|------|-----|---------|-----|---|-----------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Biotechnical analysis | B453 |

Bioassays – Immunoassays – Spectrophotometry – Chromatography –PCR

| الدرجات | | | | | الساعات | | | الاكتينوميستات | ٤٧٢ ن |
|---------|-----|-------|------|-----|---------|-----|---|----------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Actinomycetes | B472 |

Description of actinomycetes – antibiotics produced by actinomycetes (types – isolation – assay – activities – mode of action – development of resistance – immunity to antibiotics and its mechanisms – utilization – medical actinomycetes.

| الدرجات | | | | | الساعات | | | ميكروبيولوجيا التربة | ٤٩١ ن |
|---------|-----|-------|------|-----|---------|-----|---|----------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Soil Microbiology | B491 |

*Introduction to the soil as a medium for microorganisms:(soil components; soil types; microorganisms living in soil
*Carbon cycle in soil: (Decomposition of cellulose, hemicellulose, lignin, starch, pectic substances and chitin by microorganisms; transformation of hydrocarbons.)
*Nitrogen cycle in soil (Mineralization and assimilation of nitrogen; nitrification; and denitrification; fixation of nitrogen asymbiotically)
*Phosphorus and sulphur cycles in soil

| الدرجات | | | | | الساعات | | | بيئة ميكروبية | ٤٩٤ ن |
|---------|-----|-------|------|-----|---------|-----|---|-------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Microbial Ecology | B494 |

Microbial communities and ecosystems – microbial habitats – microbes-environments interactions – microbial distribution – adaptations of microorganisms to their environments – microbial degradation of pollutants – biodegradation of Xenobiotic compounds – biogeochemical cycling.

| الدرجات | | | | | الساعات | | | ميكروبيولوجيا التكافل | ٤٩٦ ن |
|---------|-----|-------|------|-----|---------|-----|---|------------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Symbioses Microbiology | B496 |

Introduction

Mycorrhizal symbiosis I- Global perspective, Classification of Mycorrhizal fungi, Host plant Types of mycorrhizae Ectotrophic or ectomycorrhizae types A-Endotrophic, endom . or arbuscular mycorrhizae (AM) B-Orchidaceous mycorrhizas a-Arbuscular (Vesicular) mycorrhizae (VAM) b-Beneficial Effects of AM, Mycorrhizae and their significance Uptake and transfer of soil nutrients Interactions with other soil organisms, Application of mycorrhizae in agriculture, Mycorrhizal dependency (MD) of the host crop, Dual Organisms" The Lichens"

II - The Morphology (Lichen thallus (the structure of lichens Growth, and development in lichens, Reproduction of lichens, Classification of lichens, Lichen conservation, Biology of lichens, Lichens as pollution indicators, Economic Relevance Other Significant Uses for lichens)

III: NITROGEN FIXATION (The Nitrogen Cycle, Biological fixation, Rhizobia and their Classification, Nodule formation Nitrogenase, The mechanism of N₂ fixation, Factors affecting of N₂ fixation, Other symbiotic N₂ fixers (Cyanobacteria) in roots, stems and ferns, Methods for estimation of N₂ fixed, The Evolution of symbiosis)

| الدرجات | | | | | الساعات | | | كائنات دقيقة ممرضة | ٤٩٧ ن |
|---------|-----|-------|------|-----|---------|-----|---|--------------------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | | Microbial Secondary Metabolism | B497 |

Biosynthesis of secondary metabolites – antibiotics, mycotoxins and alkaloids pathway – pigments biosynthesis – plant growth regulators biosynthesis – regulation of secondary metabolism

| الدرجات | | | | | الساعات | | | ميكروبيولوجيا الغذاء | ٤٩٨ ن |
|---------|-----|-------|------|-----|---------|-----|---|----------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Food Microbiology | B498 |

Environmental parameters governing food spoilage by fungi – isolation, enumeration and identification of food fungi – mycotoxins and mycotoxicosis – xerophiles – Yeasts – spoilage of foods – isolation, enumeration and characterization of food bacteria – taxonomy and toxins of food bacteria – food preservation – other control methods.

| الدرجات | | | | | الساعات | | | مقاومة بيولوجية | ٤٩٩ ن |
|---------|-----|-------|------|-----|---------|-----|---|--------------------|-------|
| oral | ACT | Mid_T | Prac | Wr. | CH | P/T | L | | |
| 10 | 10 | 10 | 20 | 50 | 3 | 2/- | 2 | Biological Control | B499 |

Microorganisms used in biological control and its mechanisms – selection of bioagent – application of microorganisms in biological control of plant diseases – fungi as biological control agents – commercialization of biological control agents - factors affecting success of biological control – safety of bioagents to the environment.