

## الفصل الاول

ت	اسم المادة	عدد الوحدات	مفردات المادة
١	Electricity Magnetism&	٣.٥	Electrostatic, electric field and Gauss's law, electric potential, capacitors, magnetism, magnetic field of moving charges, electromagnetic induction.
٢	Modern physics I	٣.٥	Special theory of relativity, postulate of special relativity, time dilation, length contraction, muons decay, relative of mass, mass and energy, energy and momentum, electromagnetic waves, photoelectric effect, what is light, x-ray production, characteristics of X-ray, Bremsstrahlung, X-ray diffraction, Compton effect, pair production, the inverse of pair production, photon absorption. De Broglie, waves of what? Wave function, probability, density, how waves are described, mathematically. formula of $\psi$ as function both X and T, particle in a box, uncertainty principle $E, \hbar$
٣	Microbiology I	٤.٥	نبذة تاريخية عن علم الاحياء المجهرية، اشكال واحجام المايكروبات، تركيب الخلية البكتيرية، الجدار البكتيري، الاركلي بكتريا، الغشاء البلازمي - تركيبه ووظائفه، الحركة البكتيرية، التحسس المايكروبي للبيئة، الابواغ الداخلية - تركيبها وصفاتها.
٤	Metabolism	٣	Bioenergetics and the role of ATP, overview of metabolism and the profession of metabolic fuels, regulation of metabolism, metabolism of carbohydrates, metabolism of lipids, catabolism of amino acids and biosynthesis of the nutritionally nonessential amino acids, catabolism of peptides and proteins, metabolism of purine and pyrimidine nucleotides.
٥	Bioinformatics I	٣	Overview for bioinformatics, nucleic acid, bioinformatics V.S. system biology, application and why need the bioinformatics, tools of bioinformatics, gene and genome, gene bank, mutation, bioinformatics laction, codons, proteins and amino acids, data base design, biological data base, limited data base bioinformatics, statistical concepts.
٦	ثقافة صحية	١	مفهوم الصحة العامة (عوامل ومسببات المرض)، التغذية والعناصر الغذائية، تلوث البيئة (الصحة المهنية)، الامراض الخمجية (النقلية)، الامراض غير الخمجية، الاسعافات الاولية.
الفصل الثاني			
ت	اسم المادة	عدد الوحدات	مفردات المادة

Temperature, temperature scales, thermal expansion of solids and liquids, molecular picture of a gas, absolute temperature and the ideal gas law, kinetic theory of ideal gas, internal energy, heat capacity and specific heat, thermal conduction, convection and radiation, 1st law of thermodynamics, 2nd law of thermodynamics, 3rd law of thermodynamics	٣.٥	Thermodynamics	١
Atomic structure, quantum mechanics, quantum theory of hydrogen atom, many-electron atoms, molecules, nuclear transformation.	٣.٥	Modern physics II	٢
التغذية والنمو الميكروبي، الوراثة الميكروبية واساسياتها، التطور الميكروبي، الميكروبات حقيقية النواة، الامراض الميكروبية والمناعة، الميكروبات في الاغذية والصناعة	٣.٥	Microbiology II	٣
Chromatography ,electrophoresis, centrifuge, dialysis, spectrophotometric techniques, structure and interaction, microscopy, radioisotope techniques, genetic analyzer.	٣	Biotechniques	٤
RNA structure, protein structure, data analysis, sequence alignment, BLAST program, FASTA program, restriction enzyme, gene cloning, phylogenetic relationship	٣	Bioinformatics II	٥
Descriptive method for categorical data, Descriptive method for continues data , probability and probability methods, estimation of parameters, introduction to statistical test of significance , comparison of population proportions, comparison of population means, correlation and regression, methods for count data, analysis of survival data and from matched studies, study designs .	٣	Biostatistics	٦