

المحتوى العلمي لمقررات المستوى الأول (برنامج الفيزياء) طبقا للائحة الداخلية للكلية بنظام الساعات المعتمدة

الفصل الدراسي الأول ٢٠١٦/٢٠١٧م

Math101 - Differentiation and Integration

١٠١ر – تفاضل وتكامل

Differentiation: A) Review and preparation for calculus. B) Limits and their properties. C) Differentiation: (Basic ideas; tangent of curve; the product and quotient rule; the chain rule); D): higher derivatives. Differentiation of trigonometric functions and their inverse; Differentiation of the logarithmic function; The exponential function, hyperbolic functions and their inverse. Applications of Differentiation

Integration: Integration and techniques of Integration: (Integration by substitution - Integration of trigonometric and hyperbolic functions - Integration by parts - Integration of rational functions by partial fractions) – Application of integration

٣ ساعات معتمدة (٢ ساعة نظري – ساعة تطبيقي)

Math102 - Statics (1)

١٠٢ر – أستاتيكا (١)

1) Vector Algebra. 2) Reduction of forces, Equivalence of sets of forces. 3) Equilibrium of frames, smooth hinges. 4) The center of mass. 5) Line integral, The work and energy. 6) The virtual work principle

٣ ساعات معتمدة (٢ ساعة نظري – ساعة تطبيقي)

Ph101 - Properties of Matter and Heat

١٠١ف – حرارة وخواص مادة

Part I: Properties of Matter: Units and dimensions – Motion in a circle – Oscillations – Gravity–Moment of Inertia - Surface tension – Viscosity – Elasticity.

Part II: Heat: Theories of the heat energy – Temperature scales and measurements – Thermal Expansion – Calorimetry – Vapors – Heat transfer.

٣ ساعات معتمدة (٢ ساعة نظري – ٢ ساعة عملي)

Chem101 - Principles of Physical Chemistry

١٠١ك – أسس الكيمياء الفيزيائية

Significant figures, Measurement and unit: the gaseous state, the gas laws, real and ideal gases, the liquid state and the solid state. Thermochemistry, thermo-chemical equations, Hess's law, ΔH for various processes, bond energies, variation of ΔH with temperature; heat capacities: Kirchhoff's equation. The solution process, ways of expressing concentration. Factors affecting solubility. Raoult's law colligative properties-lowering the vapor pressure-boiling-point elevation- freezing point Depression-Osmosis-Determination of molar Mass. chemical equilibria: The equilibrium state. The Reaction Quotient- The relationship between K_c and K_p - Heterogeneous Equilibria –Le-Chatelier's principle and chemical Equilibrium. Equilibria in Aqueous solutions The Arrhenius theory of acids and Bases. Bronsted-Lowry and Lewis theory of Acids and Bases – Auto-ionization of water and pH - Ionization Constants of Weak Electrolytes and polyprotic Acids – common Ion Effect of Buffers – Hydrolysis constants – Acid – Base Titration Curves. Solubility and K_{sp} Relationship.

٣ ساعات معتمدة (٢ ساعة نظري – ٢ ساعة عملي)

Chem102 - Principles of Inorganic Chemistry

١٠٢ك – أسس الكيمياء غير العضوية

Chemical calculations. Atomic spectra (Electromagnetic waves, Bohr's theory, principles of wave mechanics). Atomic structure. Electronic configuration of atoms. Periodic Table and the general properties of representative elements (size of atoms and ions, ionization energy, electronic affinity, electro negativity, electro positivity and polarization. Oxidation states. Types of chemical bonds (ionic, covalent, coordinate, hydrogen and metallic). Lewis structure and formal charge. Theories of bonding: valence shell electron pair repulsion (VSEPR), valence bond (VBT), molecular orbital theory (MOT) and molecular geometry.

٣ ساعات معتمدة (٢ ساعة نظري – ٢ ساعة عملي)

English Language

١٢٠ع – لغة إنجليزية

Part I: Definitions, Language development, Reading comprehensions on different science topics such as genetics, recent discoveries, new technologies, etc., knowing the different English language accents. Part II: Grammar: tenses, sentence structure, and how to write correct English. Part III: Writing: Using basic English grammar and sentence structure to write a report or a short essay of students' choices. Part IV: Vocabulary: identification of scientific terms, confusable words, and proper use of prepositions.

ساعة معتمدة نظري

الفصل الدراسي الثاني ٢٠١٦/٢٠١٧م

Math103 - Geometry and Algebra

١٠٣ ر - هندسة وجبر

Geometry: coordinate plane – rectangular coordinates and polar coordinates. Change of axes – straight line in plane and the common equation of two lines – circle – the conic section: parabola – ellipse – hyperbola. The general equation of the second degree in two variables

Algebra: Mathematical induction and partial fractions. Binomial theorem and its applications, solution of cubic equations, solution of 4th degree equations, sets, subsets, set operations and inductively definition of sets, equivalence relations, equivalence classes, partitions and partial order, maps, composition of maps, kinds of maps and inverse functions.

٣ ساعات معتمدة (٢ ساعة نظري – ساعة تطبيقي)

Math104 – Dynamics

١٠٤ ر - ديناميكا (١)

Motion of a particle in a straight line - Motion in a resisting medium - Vertical motion under the earth attraction – simple harmonic motion and its applications. Inertial frames. Motion in moving frames. Projectiles. Motion of a particle on a circle. Impulse, Impulsive forces and impact of elastic bodies. Motion of bodies of variable mass. Mechanical systems. D'Alembert's principle. Constraints. The general equation of Dynamics. Conservative systems. Lagrange's theorem on stability

٣ ساعات معتمدة (٢ ساعة نظري – ساعة تطبيقي)

Math116 - Introduction to Statistics & Probabilities

١١٦ ر - مقدمة في الإحصاء والاحتمالات

Descriptive statistics - Measures of central tendency - Measures of dispersion - Elementary probability, combinatorial analysis, conditional probability, independence and Bayes formula - Random variables (discrete and continuous), probability distribution, and moments of random variables - Cumulative distribution function and its properties - Discrete probability distributions

٢ ساعة معتمدة (ساعة نظري – ساعة تطبيقي)

Math106 - Differential Equations

١٠٦ ر - معادلات تفاضلية

Definitions, First order differential equations: linear. Separable. exact and homogenous, second order differential equations. Reduction of order, constant coefficients, second order linear equations: ordinary points and regular singular points. Euler's equation. Series solution of second order linear differential equations. Power series. Solutions about an ordinary point. Solutions about a regular singular point. Equal roots of indicial equation and roots differing by an integer

٢ ساعة معتمدة (ساعة نظري – ساعة تطبيقي)

Ph102 – Electricity, Magnetism and Optics

١٠٢ ف - كهربية ومغناطيسية وضوء



Part I: Electricity and Magnetism Electrical Units – Electric charge – Coulomb's law of electric force – Electric field – Electric potential – Gauss Theory – Electric current – Ohm's law – Heat effect of electric current – Chemical effect of electric current – Magnetic poles – Coulomb's law of magnetic force – Magnetic effect of electric current – Magnetic force on moving charge – Magnetic force on a conductors carries electric current.

Part II: Geometrical Optics: Nature of light – Refraction of light – Reflection of light – Dispersion of light through prisms – Total reflection of light– Reflection of light through a spherical surfaces – lenses – Newton's law of lenses – Eye – Optical Instruments.

٣ ساعات معتمدة (٢ ساعة نظري – ٢ ساعة عملي)

Chem103 – Principles of Organic Chemistry

ك١٠٣ – أسس الكيمياء العضوية

Introduction to organic chemistry : Atomic orbitals – Chemical bonding – Molecular orbital theory – Hybridization – Alkanes : Introduction Structural isomerism – Nomenclature Conformation – Physical properties – preparation – Reactions of cycloalkanes – Conformation Alkenes and Alkynes : Introduction – Nomenclature - Physical properties Preparation - Reactions - Geometric isomerism Polymerization Aromatic compounds : The benzene story - Aromaticity - Physical properties - Nomenclature of benzene derivatives - Electrophilic aromatic substitution - Halogenation - Sulfonation - Nitration Friedel Craft's alkylation and acylation - Reactions of alky1 benzenes - Effect and orientation of substituent groups - Polynuclear aromatic compounds - Nomenclature preparation - Electrophilic substitution reactions . Organic halides : Introduction – Physical properties - Preparation of alky 1 and ary 1 halides - Reactions of organic halides - Formation of Grignard's reagent – Electrophilic aromatic substitution Nucleophilic aliphatic substitution - Elimination reactions.

٣ ساعات معتمدة (٢ ساعة نظري – ٢ ساعة عملي)

Human Rights

ع٢١٠ – حقوق الإنسان

Identification of human rights and its international importance. Types of human rights. Human rights in Islam religion and comparative legislation. Mechanisms of human rights protection.

٢ ساعة نظرية معتمدة

Ethics of Scientific Research

ث٢١٠ – مادة ثقافية (أخلاقيات البحث العلمي)

الأخلاق والبحث العلمي: الأخلاق والصفات الأخلاقية ، أهمية البحث العلمي ، عناصر الفلسفة الأخلاقية ، منهج البحث العلمي – معايير وضوابط السلوك الأخلاقي- الاعتبارات الأخلاقية للبحث العلمي: المبادئ الأخلاقية المصاحبة لتخطيط البحث وجمع البيانات..... – أخلاقيات البحث العلمي في العلوم البيولوجية والطبية – أخلاقيات البحث العلمي والتكنولوجي من المنظور الإسلامي والقانوني – قواعد السلامة والأمان في المختبرات والتخلص الآمن من النفايات الضارة.

٢ ساعة نظرية معتمدة