



## اللائحة الدراسية:

الفصل الدراسي	الفرقة والمستوى	عدد الساعات الأسبوعية			عدد الوحدات	اسم المقرر	كود المقرر
		عملي	تمرين	نظري			
الأول	أولي علوم طبيعية	4	0	4	8	كيمياء عامة	101ك
		4	1	4	9	ضوء و كهربية	101ف
		0	2	3	5	تفاضل وتكامل	101ر
		0	2	4	6	هندسة و استاتيكا	102ر
		2	0	1	3	حاسب	قرار
الثاني		4	0	2	6	كيمياء عامة	102ك
		0	0	2	2	كيمياء عضوية	103ك
		4	1	4	9	حرارة وخواص مادة - مغناطيسية	102ف
		0	3	4	7	تفاضل عالي - جبر	103ر
		0	2	3	5	ديناميكا	104ر
	0	1	2	3	لغة انجليزية	102ل	

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		عملي	تمرين	نظري			
الأول	ثانية رياضيات و فيزياء	0	1	2	3	معادلات تفاضلية	201ر
		0	1	2	3	مقدمة في الإحصاء	202ر
		0	2	4	6	تحليل رياضي أو حقيقي - استاتيكا	203ر
		2	1	2	5	ديناميكا حرارية	201ف
		4	1	4	9	دوائر كهربيه وكهرواستاتيكيه	202ف
		0	0	2	2	حقوق الإنسان والمبادئ القانونية العامة	بدون
الثاني		0	1	2	3	جبر خطي	204ر
		0	1	2	3	هندسة فراغية تحليلية	205ر
		0	2	4	6	ميكانيكا	206ر
		4	1	2	7	جوامد والكترونيات	203ف
	2	1	4	7	فيزياء ذريه - ضوء فيزيائي	204ف	
	2	0	1	3	حاسب	قرار	
0	1	2	3	لغة انجليزية	202ل		



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		عملي	تمرين	نظري			
الأول	ثلاثة رياضيات	0	1	3	4	جبر مجرد	ر301
		0	3	4	7	تحليل مركب - تحليل عددي	ر302
		0	1	3	4	الكتروديناميكا	ر303
		0	1	4	5	نظرية المرونة - ميكانيكا متقدمه	ر304
		0	0	3	3	احتمالات وإحصاء	ر305
		2	0	1	3	حاسب	بدون
الثاني		0	1	2	3	تحليل دالي	ر306
		0	0	3	3	توبولوجي	ر307
		4	1	4	9	مبادئ علم الحاسب - برمجة	ر308
		0	0	2	2	نظرية المعادلات التفاضلية	ر309
		0	1	3	4	ميكانيكا تحليلية	ر310
		0	1	2	3	نسبية خاصة	ر311
		0	1	2	3	لغة انجليزية	ل302

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		عملي	تمرين	نظري			
الأول	رابعة رياضيات	0	0	4	4	هندسة تفاضلية - معادلات تفاضلية جزئية	ر401
		0	0	4	4	منطلق رياضي أو نظرية الأعداد أو جبر - مقرر خاص	ر402
		4	0	2	6	مبادئ علوم الحاسب	ر403
		0	0	2	2	نسبية عامة	ر404
		0	0	4	4	ميكانيكا الكم - هيدروديناميكا	ر405
		0	0	4	4	دوال خاصة - تحليل دالي	ر406
الثاني		0	0	3	3	توبولوجي - تحليل مركب	ر407
		0	0	4	4	ميكانيكا الكم - رياضيات فيزيائية	ر408
		0	0	4	4	نظرية القياس - نظرية المجالات	ر409
		2	0	2	4	مبادئ علم الحاسب	ر410
		0	0	2	2	بحث ومقال	بدون
		0	1	2	3	لغة انجليزية	ل402



## المحتوي العلمي

### الفرقة الأولى علوم طبيعية

كود أ ورقم المقرر : 101 ك  
اسم المقرر: كيمياء عامة  
محتويات المقرر:

#### **Part I: Physical chemistry (2h/w)**

- Physical chemistry
- Gaseous state
- Thermochemistry
- Chemical equilibrium
- Solutions
- Problems in physical chemistry

#### **Part II: Inorganic chemistry (2h/w)**

- Inorganic chemistry
- Chemical calculations
- Atomic structure
- Electronic configuration of atoms
- Periodic table and the general properties of representative elements
- Types of chemical bonds

#### **Part III: Practical (4h/w)**

- Introduction and safety in laboratories
- Determination of density of liquids
- Determination of viscosity of liquids
- Determination of surface tension of liquids
- Determination of empirical formula of an oxide
- Determination of hydrate
- Stoichiometric determination
- Determination of the molecular weight of volatile liquid
- Determination of the heat of formation of MgO
- Determination of heat of neutralization (strong acid and strong base)
- Determination of heat of neutralization (strong acid and weak base)
- Determination of heat of neutralization (weak acid and weak base)
- Revision



كود أ ورقم المقرر : 101 ف  
اسم المقرر: ضوء و كهربية  
محتويات المقرر:

**Part I: Optics (2h/w)**

- Nature of light
- Refraction through lenses
- Optical instruments
- Dispersion
- Photometry

**Part II: Electricity (2h/w)**

- Charge and matter
- Coulomb's law
- Electric field
- Electric field for a group of point
- Electric field of continuous charges
- Electric dipole
- Electric potential and applications
- Electric field flux and gauss's law and its applications
- Condensers
- Electric current
- Dc circuits
- Dc network analysis
- Transient current

**Part III: Optics Practical (2h/w)**

- Convex lenses
- Concave lenses
- Convex mirrors
- Concave mirrors
- Liquid leses
- Triangular prism
- Jouly's photometer

**Part IV: Electricity Practical (2h/w)**

- Ohm's law
- The relation between the filament's current and the applied voltage
- The sensitivity of a galvanometer
- The current leakage
- Determination the resistance of a voltmeter
- The meter bridge
- Measuring a small resistance

كود أ ورقم المقرر : 101 ر  
اسم المقرر: تفاضل و تكامل  
محتويات المقرر:

- Reviewing of some basic concepts of functions
- Limits and the continuity
- Derivatives



- The mean value Theorem and curve sketching
- Integration
- Application of integration
- Inverse functions
- Exponential function
- Logarithmic function
- Inverse Trigonometric functions
- Techniques of Integrations

كود أ ورقم المقرر : 102 ر  
اسم المقرر: هندسة و استاتيكا  
محتويات المقرر:

#### **Part I: Geometry (2h/w)**

- Polar and cartesian coordinates in the level systems
- A straight line
- Operations on the axes of coordinates
- Pairs of lines
- The circle
- Cuttings cone
- The general equation of 2<sup>nd</sup> degree in two variables

#### **Part II: Statics (2h/w)**

- Vectors
- Two dimensional forces acting at a point
- Moments and couple
- The plane force acting on a rigid body
- Friction

كود أ ورقم المقرر : قرار  
اسم المقرر: حاسب  
محتويات المقرر:

#### **Part I: (1h/w)**

- Hardware concepts
- Input/output ports
- Computer performance
- Memory and storage
- Input/output devices
- Software concepts
- Networks concepts
- Information and communication technology in everyday life
- Security
- Legal issues
- Internet terminology and concepts
- Web browsers concepts
- Searching the web
- Feeds and security issues
- Outlook terminology and concepts
- Sending receiving, reading replying messages, Manipulating text files and



contacts

- Organizing email and customizing settings
- Introduction to excel, manipulating rows and columns, cells, cell contents
- Worksheets, formatting , freezing row and column titles
- Formulas, functions
- Charts, customizing excel and printing issues

### Part II: Practical (2h/w)

- Windows
- Starting Microsoft word, manipulating and formatting text
- Paragraph formatting, borders, shading, styles, finding and replacing text
- Page formatting, using graphics, tabs
- Tables
- Multiple documents
- Customization, printing
- Mail merge
- Creating presentation, manipulating slides, Themes, Formatting, master slide
- Tables, graphics, charts
- Manipulating rows and columns, cells, cell contents, Worksheets, formatting , freezing row and column titles
- Formulas, functions
- Charts, customizing excel and printing issues

كود أ ورقم المقرر : 102 ك  
اسم المقرر: كيمياء عامة  
محتويات المقرر:

### Part I: Physical chemistry (1h/w)

- Physical chemistry
- The phenomena of electrolysis
- Faraday's laws
- Electrical conductance
- EMF
- Electrode potential
- Chemical and electrical energy
- Cell reaction and electrochemical series
- Solid state
- Crystallographic systems

### Part II: Inorganic chemistry (1h/w)

- The VSEPR model
- V.B. theory (hybridization of orbitals)
- Molecular geometry and resonance
- M.O. theory
- Oxidation- reduction reactions

### Part III: Practical (4h/w)

- Introduction of acidic radicals
- Detection of dilute HCL group
- Detection of H<sub>2</sub>SO<sub>4</sub> group



- Detection of miscellaneous groups
- Scheme of general investigation of acidic radicals
- Introduction of basic radicals
- Detection of groups I, II-A, and II-B
- Detection of groups III and IV
- Detection of groups V and VI
- Scheme of general investigation of basic radicals
- Detection of acidic and basic radicals of unknown salts
- Analysis of cationic radicals in a mixture

كود أ ورقم المقرر : 103 ك  
اسم المقرر: كيمياء عضوية  
محتويات المقرر:

- Introduction to organic chemistry
- Nomenclature
- Preparation and reactions of alkanes
- Nomenclature
- Preparation and reactions of alkenes
- Nomenclature
- Preparation and reactions of alkynes
- Nomenclature
- Preparation and reactions of alcohols
- Nomenclature
- Preparation and reactions of ethers
- Nomenclature
- Preparation and reactions of aldehydes and ketones
- Nomenclature
- Preparation and reactions of carboxylic acids
- Nomenclature
- Preparation and reactions of carboxylic acid derivatives
- Nomenclature
- Preparation and reactions of amines
- Revision

كود أ ورقم المقرر : 102 ف  
اسم المقرر: حرارة و خواص مادة - مغناطيسية  
محتويات المقرر:

### Part I: Heat (2h/w)

- Temperature and thermometers
- Heat estimation
- Thermal expansion
- Change of phase
- Heat transfer
- Kinetic theory of gases
- Units and dimensions fundamental units
- Derived units
- Dimension theory and its applications



- Scalar and vectors
- Linear motion
- Planer motion
- Newton`s, second law
- Simple harmonic motion
- Simpmonent of inertia for some bodies
- Simple pendulum
- Hook`s law
- Elasticity modulii
- Relation between elasticity modulii
- Stress-straincurves
- Pressure
- Pascal`s rule
- Archimede`s rule
- Bernoulli`s equation
- Surfacetension and Bernoulli`s equation
- Viscosity poiseuill`s formula
- Stokes law

#### **Part II: Properties of Matter Magnetism (2h/w)**

- Magnetic elements
- The Biot-Savart law
- Ampere`s law
- Applications of magnetic field's-magnetic field due to a current in a straight conductor
- Magnetic field of circular conductor
- Magnetic field of a solenoid
- Magnetic field of a toriod
- The force between two complete circuits
- Magnetic dipole
- Tangent and Helmholtz galvanometers
- Charged particles in magnetic fields
- Orbits of charged particles in magnetic fields
- Applications on motion particles in magnetic fields
- Cyclotron
- $Q/m$  of electrons
- Hall effect
- Mass spectrograph
- Motion of a conductor in a magnetic field
- Faraday law
- Self and mutual inductance
- Inductors connection

#### **Part III: Heat Practical (2h/w)**

- The Joul`s coefficient
- The specific heat of a solid using mixing method
- Searl`s method





- The latent heat and temperature of an amorphous material
- The Newton's law for cooling
- The simple pendulum
- The Young's modulus of a wire
- The Hook's law
- The Stock's law of viscosity
- The Poissel's law of viscosity

**Part II: Properties of Matter Magnetism Practical (2h/w)**

- The magnetic field distribution of a small magnet
- The horizontal component of the magnetic field of the earth,
- To compare the intensities of two magnets
- The Robson's magnet
- The inverse square law in magnetism
- The circular coil



كود أ ورقم المقرر : 103 ر  
اسم المقرر: تفاضل عالي - جبر  
محتويات المقرر:

**Part I: Advanced Calculus (2h/w)**

- Polar coordinates and its applications
- Partial derivatives
- Multiple integrals
- Improper integrals
- Taylor and Maclaurin series

**Part II: Algebra (2h/w)**

- Sets theory
- Relations
- Mapping
- Some basic concepts of group theory
- Mathematical induction
- Partial fractions
- Matrices and linear equations
- Complex numbers

كود أ ورقم المقرر : 104 ر  
اسم المقرر: ديناميكا  
محتويات المقرر:

- Kinematics of a particle (rectilinear motion)
- Simple harmonic motion
- Motion of a variable mass particle
- Motion in a resisting medium
- Projectiles motion
- Principle of virtual work
- Equilibrium stability

كود أ ورقم المقرر : 102 ل  
اسم المقرر: لغة انجليزية  
محتويات المقرر:

- Types of common rocks
- Writing paragraph
- Topic sentence
- Countable and non-countable nouns
- Animal cell structure
- Punctuation
- The use and non-use of articles
- Using a Relative clause
- Solar energy
- Cohesion
- Signaling
- Subject verb agreement
- Quit & Rather
- Lightning



## الفرقة الثانية رياضيات و فيزياء

كود أو رقم المقرر : 201 ر  
اسم المقرر: معادلات تفاضلية  
محتويات المقرر:

- Definition of differential equations and basic concepts
- First order differential equations
- Second order linear differential equations
- Systems of differential equations
- Laplace transformation and its applications to differential equations
- Series solutions

كود أو رقم المقرر : 202 ر  
اسم المقرر: مقدمة في الإحصاء  
محتويات المقرر:

- Introduction on probability
- The sample space
- Events and type of events
- Diagram Venn
- The definition of probability
- Harmonic analysis
- Conditional probability and independence
- Law of total probability
- The theory of Bayesian and its applications
- Random variables (discrete and continuous)
- Probability mass functions
- Probability density function
- Mathematical expectation
- Variances and standard deviation
- Cumulative distribution function and its properties and how derived from the probability distributions
- Some probability distributions(discrete): binomial distribution
- Poisson distribution
- Geometric and hyper geometric distributions
- Continuous distributions: exponential distribution
- Regular distributions
- Gamma distribution
- Beta distribution negative binomials
- Normal distribution and standard normal distribution
- Probability generating function
- Moments generating function
- Characteristic function

كود أو رقم المقرر : 203 ر  
اسم المقرر: تحليل رياضي أو حقيقي - استاتيكا  
محتويات المقرر:

## **Part I: Real Analysis (2h/w)**



- The real number system
- Countability
- Properties of sequences of real numbers
- Properties of infinite series
- Tests for convergence of real series
- Sequences and series of functions

#### Part II: Statics (2h/w)

- Vector analysis
- Center of mass
- Moment of inertia
- Fluid statics

كود أ ورقم المقرر : 201 ف  
اسم المقرر: ديناميكا حرارية  
محتويات المقرر:

#### Part I: (2h/w)

- Fundamental concepts of thermodynamics
- Thermodynamic systems
- Thermodynamic equilibrium
- Equation of state
- Internal energy
- Work, heat
- Heat capacity and heat enthalpy and est.
- First law of thermodynamics
- Second law of thermodynamics
- Reversible and Kelvin temperature
- Entropy
- Combined first and second laws of thermodynamic
- Engines and heat pumps
- Third law of thermodynamics

#### Part II: Practical (2h/w)

- Determination of the thermal conductivity of wood by Lee's method
- Verification of the Stefan's law of radiation
- Mechanical equivalent of heat
- Determination of Stefan's constant of radiation
- Determination of the thermoelectric force (EMF)
- Determination of the thermal conductivity of a rubber tube

كود أ ورقم المقرر : 202 ف  
اسم المقرر: دوائر كهربية و كهرواستاتيكية  
محتويات المقرر:

#### Part I: Electric Circuits (2h/w)

- Introduction to AC and DC currents and circuits
- Induced emf in a rotating coil
- Phase and phase difference



- Average value, root mean square value
- Resistance-capacitance-inductance in AC circuit
- Series connections: RC-RL-RLC series circuits
- Parallel AC Circuits
- Complex numbers
- Phasors
- Complex Impedance
- Analysis of parallel and series AC circuits using complex domain
- Power and corrections of power factor
- Resonance in series and parallel RLC circuits
- Quality factor
- Geometrical diagrams of AC currents
- Revision

#### **Part II: Electrostatics (2h/w)**

- Vector algebra-Gradient
- Vector differentiation and integration
- Divergence, curl
- Coulomb's law
- Electric field
- Electrostatic potential
- Gauss's law-Electrical dipole
- Multipole expansion of electricity
- Poisson's and Laplac eqs. and their solutions
- Zonal harmonics
- Electrostatic images
- Gauss's law in dielectric
- Electric displacement and susceptibility
- Electrostatic energy

#### **Practical (4h/w)**

- Investigate the voltage/current relationship for a simple A.C. inductive circuit
- A.C. circuit with inductance and resistance
- Determination of the inductance and resistance of an inductive coil by voltmeter measurements
- Investigate the voltage/current relationship for a simple A.C. capacitive circuit
- Determination of the capacitive and loss factor of an unknown capacitor by voltmeter measurements
- The oscilloscope and comparison of two capacities using a simple De Sauty A.C. bridge
- Measure the value of a large inductance using Turner's bridge
- Investigate the properties of a general A.C. series circuit
- Investigate the properties of a series a.c. circuit through resonance (



- voltage resonance)
- Determine inductance and inductor self capacitance from measurements on a resonance parallel circuit
  - Transient currents
  - Resistance-inductance circuit
  - Determination of the frequency of the A.C. mains using a sonometer
  - Determination of an unknown inductance by Owen's bridge

كود أو رقم المقرر : قرار

اسم المقرر: حقوق الإنسان و المبادئ القانونية العامة  
محتويات المقرر:

- 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

كود أو رقم المقرر : 204 ر

اسم المقرر: جبر خطي  
محتويات المقرر:

- System of linear equations and matrices
- Vector space
- Inner product
- Eigen- values and Eigen vectors
- Linear transformations

كود أو رقم المقرر : 205 ر

اسم المقرر: هندسة فراغية تحليلية  
محتويات المقرر:

- Cartesian and parametric equation of line in space
- Cartesian and parametric equation of plane in space
- Relation between lines
- Planes and spheres in space
- General theory of quadratic surface
- Sphere
- Ellipsoid
- Hyperboloid and parabolic
- Cylinder
- Cone
- Tangent plane of surfaces in space
- The general equation of 2<sub>ed</sub> degree in 3 variable

كود أو رقم المقرر : 206 ر

اسم المقرر: ميكانيكا  
محتويات المقرر:

- The small oscillation
- Central orbits
- Constrained motion
- Plane motion of a rigid body



- Motion of a particle in three dimensions

كود أو رقم المقرر : 203 ف  
اسم المقرر: جوامد و الكترولنيات  
محتويات المقرر:

#### Part I: (2h/w)

- Introduction
- The structure of atom
- Band theory of solids
- Intrinsic semiconductor
- The Doping of Semiconductors
- P- and N- Type Semiconductors
- P-N junction
- Light emitting diodes
- The Zener effect
- Some other diodes
- Rectification introduction and half wave rectifier
- Rectification full wave rectifier
- Filters capacitor filter
- Transistors construction and operation
- The common-emitter circuit
- The common-emitter amplifier
- The common-collector amplifier
- Transistor bias
- Crystal structure and crystal geometry
- Ceramic crystals
- Planar and linear density unit cell
- Crystal structure analysis

#### Part II: Practical (4h/w)

- P - n junctions (Si diode)
- P - n junctions (Gr diode)
- P-n junctions (LED diode)
- P-n junctions (Zener diode)
- Half wave rectifier
- Full wave rectifier
- Bridge rectification
- Filters
- Young's modulus by using bending rod
- Young's modulus by using Searl's method
- Shearing modulus by using Searl's method
- Shearing modulus by using torsional pendulum
- Forced oscillation

كود أو رقم المقرر : 204 ف  
اسم المقرر: فيزياء ذرية – ضوء فيزيائي  
محتويات المقرر:



### Part I: Atomic physics (2h/w)

- Cathode ray
- Electromagnetic radiation
- Atomic models
- Atomic hydrogen spectra
- Bohr theory & hydrogen atom
- Sommerfeld theory
- Fine structure
- Fine structure spectra of hydrogen like ions
- Spectra of alkali atom
- Schrodinger wave equation
- Simple one-electron atom model
- Photo electric effect

### Part II: Physical optics (2h/w)

- Simple harmonic motion
- Interference
- Diffraction of light
- Polarization of light

### Part III: Physical optics Practical (2h/w)

- Determination of the wavelengths of a mercury lamp using a diffraction grating
- Determination of the wavelength of a sodium lamp using Newton's rings
- Determination of the wavelength of a monochromatic light using Michelson interferometer
- Specific rotation (Polarimeter)
- Abbe's refract meter
- Microwave optics
- Diffraction of laser

كود أو رقم المقرر : قرار  
اسم المقرر: حاسب  
محتويات المقرر:

### Part I: (1h/w)

- Create a new project , Identify the Main, Form, Toolbox, Project Explorer and Properties window, Set the Caption and Name property, Save a Visual Basic project, Open an existing project
- Use Visual Basic's Help feature , Add a control to a form , Change the property for more than 1 control at a time
- Add an Image control and/or scroll bar to a form, and Command button to a form
- Write Visual basic code, add a frame control to a form, Print a Visual Basic application
- Make a program executable , Plan an Object Oriented Event Driven





application, Create an Object Oriented Event Driven application

- Use the timer object, Build a user interface, Add a text box control to the form
- Control Focus with the TabIndex property, Write Visual Basic equations, Use the Val function and Format function
- Create variables, constants, local, form-level, and global variables, Understand the Option Explicit statement.
- Concatenate strings, Use a dialog box, Specify the startup form
- Code IF and Case statements, Use logical operators, Use the UCase function, Add a check box control to a form, option buttons to a form
- Use the MsgBox function, the SelStart, SelLength, and Len
- Code using For Next, Do While, and Do Until
- Create a control array and general procedure, Understand an object's change event, Use the MessageBox function, Debug a program
- Create a new project , Identify the Main, Form, Toolbox, Project Explorer and Properties window, Set the Caption and Name property, Save a Visual Basic project, Open an existing project

## Part II: Practical (2h/w)

- Create a new project , Set the Caption and Name property, Save the project, Open an existing project
- Use the help feature, Change the property for more than 1 control at a time.
- Add an Image control and scroll bar to a form, and add Command button to a form.
- Write a code to the command button, Add a frame control to a form, Print an application.
- Make a program executable , add and create an Object Oriented Event to the application .
- Add the timer object to the project, Build a user interface, Add a text box control to the form.
- Add Visual Basic equations Control to the project, Focus with the TabIndex property, Use the Val function and Format function.
- Add and Create variables, constants, local, form-level, global variables, and the Option Explicit statement to the application.
- Add concatenate strings, dialog box, Specify the start up form to the project
- Use IF and Case statements, logical operators, UCase function in the project, Add a check box control, option buttons to a form
- Add the MsgBox function, the SelStart, SelLength, and Len to the application
- Use the For Next, Do While, and Do Until in the application
- Create a control array and general procedure, Understand an object's change event, Use the MessageBox function, Debug a program, Program a list box and a combo box , Develop a program function
- Revision

كود أو رقم المقرر : 202 ل  
اسم المقرر : لغة انجليزية  
محتويات المقرر :



- Calculating: Liquids and Gases
- Reporting: The origins of life
- Describing: The Universe
- Predicting: The weather
- Experimenting: Electricity and magnetism
- Giving evidence: Smoking, Drugs, and Alcohol
- Cause and Effect: Color, Light, and Sound
- Comparing: The Elements
- Classifying: The Composition of Matter

### الفرقة الثالثة رياضيات

كود أو رقم المقرر : 301 ر

اسم المقرر: جبر مجرد

محتويات المقرر:

- Groups
- Finite groups, subgroups
- Cyclic groups
- Permutation groups
- Isomorphisms
- Cosets and Lagrang's theorem
- Normal subgroups and factor groups
- Groups Homomorphisms
- Fundamental theorem of finite Abelian groups

كود أو رقم المقرر : 302 ر

اسم المقرر: تحليل مركب – تحليل عددي

محتويات المقرر:

### **Part I: Complex analysis (2h/w)**

- Algebraic of complex number
- Complex functions and some mappings
- Elementary functions (exponential, logarithmic, complex exponents)
- Complex integration
- Cauchy integral theorems
- Liouville's theorem and Morris theorem
- Power series
- Taylor series and Laurent series
- Classification of singularities

### **Part II: Numerical Analysis (2h/w)**

- Mathematical preliminaries and error analysis
- Solutions of equations in one variable
- Interpolation and polynomial approximation
- Numerical differentiation and integration
- Numerical solutions of initial value problems
- Numerical solutions of system of ordinary differential equations
- Numerical solutions of boundary value problems



كود أ ورقم المقرر : 303 ر  
اسم المقرر: الكتروديناميكا  
محتويات المقرر:

- Principles of electrostatics
- Electromagnetism and its relation to relativity
- Time independent current distributions magnetostatics
- The variation of the electromagnetic field with time

كود أ ورقم المقرر : 304 ر  
اسم المقرر: نظرية المرونة - ميكانيكا متقدمة  
محتويات المقرر:

#### **Part I: Theory of elasticity (2h/w)**

- Essential mathematics (tensor algebra)
- Stress principles
- Kinematics of deformation and motion
- Fundamental laws
- Linear elasticity

#### **Part II: Advanced mechanics (2h/w)**

- The principal definition of motion mechanical systems
- Dynamics of a rigid body
- Analytical mechanics principles
- Lagrange's equations
- Hamiltonian equations
- Routh's equations
- Poisson's brackets
- Canonical transformation

كود أ ورقم المقرر : 305 ر  
اسم المقرر: احتمالات و إحصاء  
محتويات المقرر:

- Joint probability density functions for discrete and continuous random variables
- Marginal probability density functions for discrete and continuous random variables
- Bivariate cumulative distribution functions
- Marginal cumulative distribution functions
- Conditional probability density functions for Bivariate discrete and continuous random variables
- Conditional cumulative distribution functions
- The mean and variance for sum-product-quotient random variables
- The covariance and correlation coefficient for discrete and continuous random variables
- Conditional expectation and conditional variance for Bivariate discrete and continuous random variables
- Joint moments (raw- about the means) and joint moment generating functions



- Application of Bivariate probability distribution functions as trinomial distribution and Bivariate normal distribution
- Distribution of functions of random variables
- Introduction to sampling theory
- Introduction to statistical estimation

كود أو رقم المقرر : قرار  
اسم المقرر: مبادئ علم الحاسب  
محتويات المقرر:

#### Part I: (1h/w)

- Introduction to database concepts
- Create tables and identify keys
- Relationships between tables
- Deleting with different queries
- Deleting with forms, deleting with reports
- Deleting with macros
- Dealing with SQL
- Apply visual basic modules and explain
- Demonstrate internet features of access

#### Part II: Practical (2h/w)

- Access GUI
- Create tables
- Create relationship
- Deleting with queries
- Deleting with forms
- Deleting with reports
- Deleting with macros
- Dealing with SQL
- Apply Visual Basic modules.

كود أو رقم المقرر : 306 ر  
اسم المقرر: تحليل دالي  
محتويات المقرر:

- Metric spaces
- Complete metric spaces
- Contraction mapping. The fixed point theorem
- Completion of metric spaces
- Normed spaces, Banach spaces
- Linear operator. Inverse operator
- Bounded and continuous linear operator
- Linear functional
- Normed spaces of operators. Dual space
- Hahn-Banach Theorem

كود أو رقم المقرر : 307 ر  
اسم المقرر: توبولوجي  
محتويات المقرر:



- Topology of the line and plane
- Topological spaces
- Bases and subbases
- Continuity and topological equivalence
- Topological properties
- Countability
- Separation axioms

كود أو رقم المقرر : 308 ر  
اسم المقرر: مبادئ علم الحاسب - برمجة  
محتويات المقرر:

#### **Part I: Principle of computer science (2h/w)**

- Introduction to Matlab Programming
- Advanced Matlab programming techniques
- Introduction to numerical methods
- Dealing with symbolic calculus
- Graphics and data visualization (2D and 3D)
- Introduction to Graphical User Interfaces in Matlab
- Interfaces in Matlab (Designing GUI interfaces using Matlab's GUIDE interface)

#### **Part II: Principle of computer science practical (2h/w)**

- Introduction to Matlab programming
- Advanced Matlab programming techniques
- Introduction to numerical methods
- Dealing with symbolic calculus, graphics and data visualization
- Using Matlab's GUIDE interface
- GUI Interfaces in Matlab

#### **Part III: Programming (2h/w)**

- Introduction to Linear programming problem (LPP)
- Graphical method for solving LPP
- Simplex method
- Special cases of simplex method
- Artificial variable technique
- Duality in Linear programming
- Integer programming problem
- Parametric programming
- Revised simplex method

#### **Part IV: Programming practical (2h/w)**

- Introduction by using Matlab
- Graphical method
- Simplex method
- Compact method
- Two phase method



- Dual simplex method
- Revised simplex method

كود أ ورقم المقرر : 309 ر  
اسم المقرر: نظرية المعادلات التفاضلية  
محتويات المقرر:

- Existence and unique of solutions
- System of first order linear equations
- Series solutions of second order differential equations
- Basic stability theory
- Oscillation of second order equations

كود أ ورقم المقرر : 310 ر  
اسم المقرر: ميكانيكا تحليلية  
محتويات المقرر:

- Elliptic integrals and Jacobe's elliptic functions
- Moments of inertia and mixed moments of inertia
- Motion of a rigid body about a fixed point
- The integrated cases of motion of heavy rigid body about a fixed point
- The constrained integral cases
- Lagrange and Hamilton equations of holonomic systems
- Some problems and the typical method

كود أ ورقم المقرر : 311 ر  
اسم المقرر: نسبية خاصة  
محتويات المقرر:

- The principles of the theory of relativity
- Relative kinematics
- Relative Mechanics
- Geometric representation of the Lorntaz transformations
- Special relativity and electromagnetism
- Overview of the theory of general relativity
- Applications of the theory of special relativity

كود أ ورقم المقرر : 302 ل  
اسم المقرر: لغة انجليزية  
محتويات المقرر:

- The migration of birds (Reading)
- Coral reefs (Reading)
- Smuggling of Nuclear materials (Reading)
- Chemical Reactions (Reading)
- Enquiry (Reading)
- Argument (Reading)
- Roots (Vocabulary)
- Prefixes (Vocabulary)
- Suffix (Vocabulary)
- Relative Clauses (Grammar)
- Adjectives and Adverbs (Grammar)
- Writing A summary (Writing)



- Summarizing process (Writing)
- The summary Report (Writing)
- Cause and Effect Research Paper (Writing)

كود أو رقم المقرر :  
اسم المقرر: التدريب الصيفي  
محتويات المقرر:

- Mathematics package
- One of the Programming Language
- Web design
- Application software

#### الفرقة الرابعة رياضيات

كود أو رقم المقرر : 401 ر  
اسم المقرر: هندسة تفاضلية - معادلات تفاضلية جزئية  
محتويات المقرر:

#### **Part I: Differential Geometry (2h/w)**

- Preliminaries and background
- Concept of a curve
- Curvature and Torsion
- Theory of curves
- Concept of a surface
- First and second fundamental forms
- Normal curvature

#### **Part II: Partial Differential Equations (2h/w)**

- Basic concepts of partial differential equations
- Linear partial differential equations of first order
- Nonlinear partial differential equations of first order
- Homogeneous linear partial differential equations with constant coefficients
- Nonhomogeneous linear partial differential equations with constant coefficients
- Linear partial differential equations of order two with variable coefficients
- Nonlinear partial differential equations of order two with variable coefficients

كود أو رقم المقرر : 402 ر  
اسم المقرر: منطق رياضي أو نظرية الأعداد أو جبر - مقرر خاص  
محتويات المقرر:

#### **Part I: Logic or Number theory of Algebra (2h/w)**

- Fundamental theorems on divisibility
- Theory of congruence
- Introduction to Diophantine equations
- Fermat's number and theorem
- Rational and irrational numbers
- Review



## Part II: Optional Course (2h/w)

- Some review of probability theory and general concept of stochastic processes
- Classification of stochastic processes
- Stationary stochastic processes
- Definitions of stationary of order  $n$
- Strictly stationary
- Covariance stationary
- Auto correlation and cross-correlation
- Spectral density functions
- Bernoulli processes
- Definitions of Bernoulli processes as an example of stochastic process
- Random walk as an example of Bernoulli processes
- Deducing the binomial process as the distribution of the number of successes in the first  $n$  Bernoulli trials
- Definition of the times at which the successes of a Bernoulli process occur
- Relation between the times of successes and the number of successes in the first  $n$  Bernoulli trials
- Discrete time Markov chain definitions and examples
- Higher transition probabilities
- Determination of higher transition probabilities
- Classification of states and chains
- Stability of a Markov chain: limiting Behaviour
- Markov processes with discrete state space
- Poisson process
- Poisson process and related distributions
- Generalizations of Poisson process champagne
- Pure birth and birth and death processes
- Markov processes with discrete state space (continuous time Markov chains)

كود أ ورقم المقرر : 403 ر  
اسم المقرر: مبادئ علم الحاسب  
محتويات المقرر:

## Part I: (2h/w)

- Mathematics and introduction to symbolic computation with Maple
- Calculus
- Exact and approximation solutions of equations
- Graphics and animation with Maple
- Linear algebra with Maple
- Abstract algebra with Maple
- Differential calculus and applications with Maple
- Integral calculus and applications with Maple
- Ordinary differential equations





- System differential equations of with applications with Maple
- Dealing with series and sequences

### Part II: Practical (4h/w)

- Mathematics and introduction to symbolic computation with Maple
- Calculus
- Exact and approximation solutions of equations
- Graphics and animation with Maple
- Linear algebra with Maple
- Abstract algebra with Maple
- Differential calculus and applications with Maple
- Integral calculus and applications with Maple
- Ordinary differential equations
- System differential equations of with applications with Maple
- Dealing with series and sequences

كود أ ورقم المقرر : 404 ر  
اسم المقرر: نسبية عامة  
محتويات المقرر:

- The principal of the general relativity
- The tensors
- The applications of tensors
- Einshtien equations in the space
- Einshtien equations in the present of material

كود أ ورقم المقرر : 405 ر  
اسم المقرر: ميكانيكا الكم - هيدروديناميكا  
محتويات المقرر:

### Part I: Quantum Mechanics (2h/w)

- Origins of the quantum theory
- Introduction to quantum mechanics
- Introduction to operators
- Applications of Schroedinger's equation to one – dimensional problems
- Revision

### Part II: Hydro Dynamics (2h/w)

- Fluid kinematics
- Fluid dynamics
- Motion in two dimensions

كود أ ورقم المقرر : 406 ر  
اسم المقرر: دوال خاصة - تحليل دالي  
محتويات المقرر:

### Part I: Special Functions (2h/w)

- Gamma and Beta functions
- Legendre polynomials
- Bessel function



- Hermit polynomials
- Laguerre polynomials
- Hypergeometric functions

### Part II: Functional Analysis (2h/w)

- Inner product space, Hilbert Space
- Further properties of Inner product spaces
- Orthogonal sets and sequences
- Representation of functionals on Hilbert spaces
- Hilbert-adjoint operator
- Self-adjoint, unitary and normal operators
- Adjoint operator
- Banach-Steinhaus theorem
- Strong and weak convergence
- Convergence of sequences of operators and functional
- Open mapping theorem

كود أو رقم المقرر : 407 ر  
اسم المقرر: توبولوجي - تحليل مركب  
محتويات المقرر:

### Part I: Topology (2h/w)

- Metric spaces
- Compactness
- Product spaces
- Connectedness
- Function spaces

### Part II: Complex Analysis (2h/w)

- Conformal mapping (some applications)
- Residues theorem and the calculation of some real integrals
- Study in the theory of functions
- Transformation of Schwarz-Christoffel

كود أو رقم المقرر : 408 ر  
اسم المقرر: ميكانيكا الكم - رياضيات فيزيائية  
محتويات المقرر:

### Part I: Quantum Mechanics (2h/w)

- Applications of Schrodinger's equation to three - dimensional problems
- Spherically symmetric systems
- Vector spaces and linear operator : Dirac notation
  - Mathematical approximation method in quantum mechanics
  - Variational method
  - Angular momentum
  - Revision

### Part II: Mathematical Physics (2h/w)

- The partial differential equations of mathematical physics



- Separation of variables and ordinary differential equations
- Special functions and its applications
- Green's function and integral equations
- Laplace and Fourier transformations

كود أو رقم المقرر : 409 ر  
اسم المقرر: نظرية القياس - نظرية المجالات  
محتويات المقرر:

#### Part I: Measure Theory (2h/w)

- Measurable sets
  - Properties of measurable sets
  - Measurable functions
  - Lebesgue integral
  - Further property of Lebesgue integral

#### Part II: Theory of Fields (2h/w)

- Let there be light
- The interaction of radiation with matter
- Multipole expansion of the radiation field
- Waveguides and cavities
- Electric and magnetic susceptibility

كود أو رقم المقرر : 410 ر  
اسم المقرر: مبادئ علم الحاسب  
محتويات المقرر:

#### Part I: (2h/w)

- Getting started to Mathematica
- Working with Mathematica
- Functions and their graph
- Algebra
- Calculus
- Multivariable
- Linear algebra
- Programming

#### Part II: Practical (2h/w)

- Getting started to Mathematica
- Working with Mathematica
- Functions and their graph
- Algebra
- Calculus
- Multivariable
- Linear algebra
- Programming
- Differential Equations

كود أو رقم المقرر : بدون



اسم المقرر: بحث و مقال  
محتويات المقرر:

- Introduction to an essay or research
- Choosing the subject of the essay or research
- Main topics of the essay or research
- Collecting materials
- Revisions of the collected materials
- Collection of references in the essay
- Writing the essay
- Revisions of the written materials
- Editing of the materials
- An overall revision for presentation

كود أ ورقم المقرر : 402 ل  
اسم المقرر: لغة انجليزية  
محتويات المقرر:

- Meteorology
- Physics, Chemistry, Matter, Mass and Molecules
- For & Against Essays
- Opinion Essays
- Providing solution to problems Essays
- Assessing good and bad points
- Gerund and infinitive
- Noun Clauses
- Conjunctions and prepositions
- Linking ideas
- Structure and cohesion