Courses-Contents

ES131 Engineering Mathematics 1	
12 Units	Prerequisite(s): -
Calculus: Simple functions and equations: linear, polynomials,exponential, logarithm tic, trigonometric, inverse, trigonometric, hyperbolic and their derivative and physical applications, and Taylorand Maclaurin series) Trigonometric identities: Single angle, compound angels, double and half angle identities Methods ofintegration: Partial fraction by parts, completing the square,trigonometric substitution application, multiple integrals, applicationof multiple integrals (area, vol.me, mass and mean values of functions).	

ES141Applied Physics	
12 Units	Prerequisite(s): -
Mechanics: Linear and circular motion, Newton's Laws of motion, work energy, conservation laws Properties of matter clasticity,surface tension, and fivid mechanics - Heat and thermodynamics: heal, laws of thermodynamics, ideal gas Vibration and waves: simple harmonic motion, vibrations, traveling and standing waves, propertiesand prepagation of sound Electricity and magnetism: charge, coulomb's law, electric field. Gauss's law, and its application.	

ES143Applied Physics Laboratory	
3 Units	Prerequisite(s): -
Some experiments to apply the main concepts of Applied physic course.	

ES161 Technical Arabic Writing	
6 Units	Prerequisite(s): -
Introduction and augmentation of specialized vocabulary and aspects of scientific technical Arabic used in the different departments of engineering.	

ES171 Technical English Writing	
6 Units	Prerequisite(s): -
Research definition Specialty Research steps research types and purpose - Rescarch subject choice Research plan preparation - Library 1 classification system Reference Usage Murgin Numbering met Technical report writing rules (graduation projects, Laboratory rep works, manner, quotation Numbering signs - Suntmarization Data simplex, turnout & frequentative aibles shapes; graphic drawings - Ch columns Maps Research Exit and its printing Research discussion at evaluation-Laying out and research: sample preparation.	

ES165Engineering Drawing	
9 Units	Prerequisite(s): -
The need for a graphic language - Use and care of drawing instruments and equipment - Freehand sketching Orthographic projections sectioning and dimensioning of single machine elements Isometric drawing and dimensioning Space analysis of points and lines with applications Tlucad dimensioning, standard M/C elements assembly, space analysis, views of a po.nt, lines, true length of line and oblique lines, beating slope and grade. Steel structure drawing. Mechanical assemblics.	

ES132Engineering Mathematics II	
9 Units	Prerequisite(s): -ES131
Basic Matrices algebra: Matrix addition, multiplication by scalar, matrix multiplication - The transpose of a matrix - The determinant of a natrix The inverse of a matrix The rank of a matrix Special types of square matrix Eigen value and Eigenvectors problems - Vector spaces(basic vectors, inner product, some useful inequality) - Numerical linear algebra, lincar differential equations, linear programming, linear product spaces - Simultaneous linear equation - Applications in various areas such as control theory - Statistics, linear circuit and vibration theory, etc.	

ES146Engineering Chemistry	
9 Units	Prerequisite(s): -
The course covers the study, of the atornic structure, periodic table, gascous state, thermos-chemistry, and introduction to the different classes of organic compounds with special emphasis of functional groups, nomenclature, isomerism and fundamental concepts bout structure and reactivity The study of artificial radio activity, chemical bunds, theory of the covalent bond, classification compounds, the chemical behavior of some common substances, thermodynamics, electrochemistry, solid-state chemistry and the organic reaction of alkenes, cyclo-alkenes, alkenes, alkenes, alkyl halides, alcohols, aldehydes and ketones, with detailed study of reaction mechanisms.	

ES148Engineering Chemistry Laboratory	
3 Units	Prerequisite(s): -
Some experiments to apply the main concepts of Engineering Chemistry course.	

ES130Environmental Pollution	
6 Units	Prerequisite(s): -
Introduction: definition of pollution and contamination - Air pollution (introduction, types of air pollutants, lead and acid rain (SO, NO,) effects of air pollution on the environment and human health, air quality criteria, air pollution monitoring and control, air pollution control, stack design Water pollution (introduction, sources of water pollution industrial and sewage effluent, water pollution control, waste water treatment process Marine pollution (definition, sources, types o pollutants, heavy metals, monitoring and control, quality criteria, PL and Tgco indices) Land pollution (sources, type of pollutants, solic wastes handling and management, incineration and disposal of solic waste) Radioactive wastes.	

ES152Computer Programming	
9 Units	Prerequisite(s): -
Introduces the use of a high-level programming language (C/C++) as a problem-solving tool- including basic data structures and algorithms, structured programming techniques, and software documentation - Designed for students who have had little or no prior experience with computer programming.	

ES156Workshop Technology	
9 Units	Prerequisite(s): -ES165
Industrial safety, engineering materials and their properties, hea treatment of steel, ferrous and nonferrous metals, natural and synthetic materials, introduction to manufacturing processes, casting welding forging, rolling and extrusion, machining of metals.	

ES201Differential Equations	
12 Units	Prerequisite(s): -ES131
Basic concepts First-order differential equations- Equations of second order and higher order - Exact and inexact differential Useful theorem of partial differentiation (wave equation, diffusion equation)- Boundary value problems Series solutions - Some classical equations -System of first order equations Laplace transform and operational Methods - Simple numerical methods - Linear difference equations.	