PRIMARY CLASS

Primary Class

090 ENGINEERING MATHEMATICS 1

Functions and related concepts -limit of functions- continuity of functions - derivatives of algebraic functions - applications of differentiation - Derivatives of trigonometric functions - undetermined quantities - L`Hopital rule - indefinite integrals - definite integrals simple substitution methods - applications of definite integrals. transcendental functions (inverse trigonometric function. natural logarithmic function. the exponential functions,the general exponential function,the general logarithmic function) -integration methods- indefinite integrals - hyperbolic functions - polar coordinates and its applications.

091 ENGINEERING MATHEMATICS 2:

Mathematical induction - partial fractions - inequalities - the binomial series - complex numbers - system of linear algebraic equations -determinants, matrices and their applications - vectors and vector spaces - eiginvalues and eigen vectors - power series - conic sections.

092 ENGINEERING MECHANICS

Engineering statics:

Introduction,(Newton`s laws, vectors), Forces in space - Moment - Couple - equilibrium - Engineering structures - (Trusses,Machines) - Distributed Forces - Centroids of area - Volume - Applications on Beams - Hydrostatics - Friction - Wedges - screws.

Engineering Dynamics:

Introduction, Kinematics of particles, Rectilinear, Angular and curvilinear Motion - Rigid bodies, Relative motion, Relative linear displacement Relative linear velocity.

093 ENGINEERING PHYSICS

Relativistic Effects- Oscillatory Motion -Continuum Mechanics - Thermal Properties of Matter - Thermodynamics - Gauss Law - Potential - DC Circuits - Sources of Magnetic Fields - Dielectric and Magnetic Materials - waves - Electromagnetic waves - Resonance of Waves - Atoms and spectra - Atoms and Molecules Nuclei of Atoms - Lasers - EngineeringMolecular physics.

094 ENGINEERING CHEMISTRY

Part 1 :

Introduction to different states of matter and the different forms of the equation of state of gases - Introduction to chemical thermodynamics - Thermochemistry - Properties of solution - Phase change and chemical equilibria -chemical kinetics - Electrochemistry and its application - Material and heat balance in combustion and chemical procerses.

Part 2 :

It Includes applications on some industrial processes, Fuel Technology - Cement industry - Fertilizer industry - Dyes and Dyeing industry - Water Pollution - Air pollution and its control.

095 WORKSHOP TECHNOLOGY

Introduction to production engineering - Metallic & Non - metallic metals. Steel & Cast-iron furnaces - metal costing- Metal forming processes (forging - Rolling - Extrusion - Drawing - bending) - Sheet metal work (Development - joint of parts - breezing & soldering) - Welding Processes - Intrude. to metal cutting (Turning - Shaping - matting - drilling - grinding) - Simple measuring tools - production quality - Industrial safety.

096 ENGINEERING DRAWING

Drawing Instruments - Type of lines - Geometric Constructions - Dimensioning - Engineering Projection - Isometric Drawing - Missing Views -Intersection of Engineering Bodies -Auxiliary Views - Unfolding of Engineering Bodies - Sectional Views - steel constructions - Freehand Sketching - Inking - Reproduction and Storing of Finished Drawings - Computer Aided Drawings.

097 INTRODUCTION TO ENGINEERING

What is meant by Engineering - How to chose scientifically Engineering job - Engineering Jobs(Research, Development, Design, production, construction, operation, Management, Sales) Intonation of Engineering departments, Engineering planing and thinking - How to planing - How to use library, Engineering Societies in Egypt, Engineering studies, engineering Departments at Faculty of Engineering mansoura university, Studies in different department.

098 ENVIRONMENT SCIENCE

Introduction to the importance of studying environment science . Integration of environment components,Technology and its effects on the environment,Water source utilization and its effects on the environment. city as an environment system. Environment and industrial planning. Environment and public health. Problems of environment pollution in a city - Laws for environment protection - pollution and pollution control -A glance to environment future.

099 ENGINEERING LANGUAGE

Study of Engineering Education and some Engineering Units with Exercises on: Reading and comprehension - use of language -Information Transfer - Guided writing - and Free Reading.

Code No	Course Title	No.of Hrs/W Lect.	Tut. Lab	Total	Maximum Marks Fin. Exa.	Year`s Work	Mid Exa	Oral Exa.	Total	Final exam Hours
090	Engineering Mathematics 1	2	2	4	60	20	20	--	100	3
091	Engineering Mathematics 2	2	2	4	60	20	20	--	100	3
092	Engineering Mechanics	2	2	4	60	20	20	--	100	3
093	Engineering Physics	3	2	5	90	20	20	20	150	3
094	Engineering Chemistry	2	2	4	60	10	20	10	100	3
095	Workshop Technology	2	3	5	90	20	20	20	150	3
096	Engineering Drawing	1	3	4	90	30	30	--	150	4
097	Introduction to Engineering	1	-	1	30	--	20	--	50	2
098	Environment Science	1	-	1	30	10	10		50	2
099	Engineering Language	-	2	2	30	10	10	--	50	2
		16	18	34					1000	

ELECTRICAL ENGINEERING

ELECTRICAL ENG. DEPARTMENT
First Year

S10 ENGINEERING MATHEMATICS

First order ordinary differential equations and their engineering applications - second order ordinary differential equations and their engineering applications - higher order differential equations - system of differential equations and their engineering applications - series solution of ordinary differential equations and its applications - functions of several variables and their derivatives - double and triple integrals - curvature - line and surface integrals.

S11 APPLIED MECHANICS

Dynamic of Rectilinear motion - Dynamic of Curvilinear Motion Moment of Inertia of Material bodies -Rotation of rigid bodies about fixed axis -Gyroscopes - Plan Motion of a rigid body - Relative motion Virtual work.

S12 ENGINEERING MATERIALS

Structure of the Atom- Conductivity of Metals (Part I) - Conductivity of Metals (Part II)- Dielectric Properties (Part I - Static Field) - Dielectric Properties (Part II - Alternating Fields) - Magnetic Properties of Metals - Semi-conductors.

S13 ELECTRICAL FUNDAMENTALS

Electrostatic fields and capacitors -(Electromagnetic Fields and inductances) - (Direct current circuits) - Network Theorems - Alternating current circuits - Three Phase circuits.

S14 ELECTRONIC FUNDAMENTALS

Energy bonds in solids - Transport phenomena in semiconductors - Junction - diode characterization - Diode Circuits - Transistor characteristics.

S15 ELECTRICAL MEASUREMENTS

Introduction to electrical instruments-controlling and damping torques - Moving Coil instruments - Moving iron instruments - Rectifier - Dynamometer Type instruments - Induction Type instruments - Frequency and power factor meters - synchroscopes - D.C. and A.C. bridges.

31-5-11

S16 ELECTRICAL DRAWING

Symbols for Components of electrical systems - Electrical circuits representation illumination and power systems - single line and 3 line representation - Assembly drawing and projections of Electrical instruments - Bolts - Nuts - Rivets - springs - Wedges - Roller and Ball Bearings.

S17 THEORY AND CONSTRUCTION OF MACHINES

Loads acting on machine elements - Stress & strain - Axial tension and compression - Torsion of circular shafts - Bending loads - Analysis of plane stress & strain - Mohr's circle - Stress concentration factor - Factor of safety (design) - Theories of failure - Design of power transmission shafts considering torsion and bending - Design of fasteners (bolts, screws, keys) - Design of shaft couplings -pullers and belts - Gears - Theory of machine vibrations - Free, forced & Damped vibrations - Vibration measuring instruments - Methods of reducing vibrations.

S18 ENGINEERING ECONOMICS

Introduction to Economics - Demand,Supply and Equilibrium - National Income Accounting - Saving, Consumption and Investment - The Determination of National Income - Fiscal Policy and National Income - The Business Cycle - The Role and Importance of Money - Commercial Banks and the Money supply - The Federal Reserve and Monetary Policy - Synthesis of Monetary and Income Analysis - Full Employment and Price Stability - Economic Growth - Demand,Supply and Elasticity - The Theory of consumer Demand and Utility - Costs of Production - Price and output :Perfect Competition - Price and Output: Monopoly - Price and Output: Monopolistic competition and Oligopoly - Wage Determination - Rent,Interest and Profits - International Trade and Finance.

S19 ENGLISH LANGUAGE

The Course includes eight units each one contains: Reading and Comprehension - Use of Language - Information Transfer - Guided writing - Reading and Summering .

21-5-11

ELECTRICAL ENGINEERING

First year

Code No	Course Title	No. of Hrs/W			Maximum Mrks					Final exam Hours
		Lect.	Tut. Lab	Total	Fin. Exa.	Year's Work	Mid Exa	Oral Exa.	Total	
510	Engineering Mathematics	2	2	4	60	20	20	--	100	3
511	Applied Mechanics	2	2	4	60	20	20	--	100	3
512	Engineering Materials	2	1	3	60	20	20	--	100	3
513	Electrical Fundamentals	3	2	5	90	20	20	20	150	4
514	Electronic Fundamentals	2	2	3	60	20	20	--	100	3
515	Electrical Measurements	2	1	3	60	10	20	10	100	3
516	Electrical Drawing	-	3	3	90	20	20	20	150	4
517	Theory & cons. Machines	2	2	4	60	20	20	--	100	3
518	Eng. Economics	2	-	2	30	--	20	--	50	2
519	Eng. Language	-	2	2	30	--	20	--	50	2
		17	17	34					1000	

ELECTRICAL ENG. DEPARTMENT
Second Year

S20 ENGINEERING MATHEMATICS

Fourier Series - Fourier intervals - partial differential equations (wave eqn. heat eqn. Laplace eqn) - Functions of a complex variable (Limits and continuity & derivative, Couchy Reimann eqns, analytic functions, line integrals - Green`s theorem - cauchy`s theorem and its applications the residue theorem and its applications) - numerical methods for solving algebraic and differential eqns - numerical integration - interpolation - Curve fitting .

S21 ELECTRIC CIRCUIT THEORY

Network differential equations - Switched networks - Impedance concept Response to sinusoidal sources - Resonance - Complex frequency - Power in sinusoidally driven networks - Trigenometric Fourier series - Exponential Fourier series and Fourier transform - The Laplace transform and network solutions - Two-port networks.

S22 ELECTRICAL MACHINES

Introduction - Direct current machines: Structure, Magnetic circuit, Armature winding, E.M.F Equation, Armature reaction and commutation, Excitation methods, steady state performance, Testing and control Special machines, Generalized model - Power Transformer: construction, Cooling methods, Theory, Testing and Performance, three phase connection, parallel operation, special transformers connections.

S23 ELECTRICAL POWER ENGINEERING

Structure of electrical power systems -D.C Distribution system A.C Distribution systems - Electrical performance of O.H.T.L. -Mechanical design of O.H.T.L.- and Underground cables - Electrical Power stations (Brief study).

S24 ELECTRONIC ENGINEERING

The transistor at low Frequencies - Field effect transistors - Multistage amplifiers - Feedback amplifiers - Stability and Oscillators - Operational amplifiers - Integrated circuits as analog system building blocks.

525 ELECTROMAGNETIC - FIELD - THEORY

Vector analysis, Electrostatics: Field equations and boundary conditions, the image method, the capacitor and its capacitance, the energy of the electrostatic field - Stationary current fields: Field equations and boundary conditions, the general solution for the magnetic field of stationary currents, the magnetic flux and the flux linkage.

526 ELECTRICAL MEASUREMENTS

Measurements and Measuring systems - Characteristics of Instruments and Measurement systems - Errors and statistical Analysis - Units systems, Dimensions and standards - Circuit components (Resistors, Inductors and capacitors) -Analog Instruments (Galvanometers, Ammeters, Voltmeters and ohmmeters - Instrument Transformers) - Measurement of Phase, frequency, Resistance, Energy and Industrial Metering - Potentiometers & power system Measurements - A.C. & D.C. Bridges - High Voltage Measurements and Testing - Magnetic Measurement & Illumination - Electronic Instruments - Transducers and signal conditioning - Data Transmission and Telemetry - Display Devices and Recorders - Measurement of Non Electrical Quantities - Data Acquisition Systems.

527 THERMAL ENGINEERING

Introduction - First law of thermodynamic - second law of thermodynamics - Ideal Gases and its mixtures - Gas cycles - Pure substances - Vapor cycles - Refrigeration cycles - Introduction to Heat Transfer - Heat Exchangers.

528 ENGINEERING MANAGEMENT

Modern Management Thought - Traditional Principles of Organization - Organization: Research and Theory - Motivation Incentives and Morale - Policy Formulation planning and Decision Making - Control - Uses of Accounting in Planning and Control.

529 COMPUTER PROGRAMING

Digital computer concept, modes of applications, hardware Software, steps of solving a problem on a computer - Algorithms and flowcharts, programming. Basics of Fortran language - Expended facilities and capabilities of Fortran language. Numerical solution of non - linear equations and simple Computer applications.

ELECTRICAL ENGINEERING

Second Year

Code No	Course Title	No. of Hrs/W			Maximum Mrks					Final exam Hour
		Lect.	Tut. Lab	Total	Fin. Exa.	Year's Work	Mid Exa	Oral Exa.	Total	
520	Engineering Mathematics	2	1	3	60	20	20	--	100	3
521	Electric Circuit Theory	2	2	4	60	20	20	--	100	3
522	Electrical Machines	2	2	4	60	20	20	--	100	3
523	Electrical Power Eng.	2	2	4	60	20	20	--	100	3
524	Electronic Engineering	2	1	3	60	20	20	--	100	3
525	Electromagnetic Field- Theory	2	2	4	60	20	20	--	100	3
526	Electrical Measurements	2	2	4	90	20	20	20	150	3
527	Thermal Eng.	2	1	3	60	20	20	--	100	3
528	Eng. Management	2	-	2	30	--	20	--	50	2
529	Computer Programming	1	2	3	60	20	20	--	100	3
		19	15	34					1000	

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ELECTRICAL ENG. DEPARTMENT
Third Year

530 ENGINEERING MATHEMATICS

Special functions - numerical solutions of partial differential equations - graph theory - logic and its applications - Boolean algebra - probability Theory - introduction to mathematical statistics .

531 AUTOMATIC CONTROL

Derivation of system transfer functions - steady state and transient response - stability and root locus technique.

532 HEAT AND HYDRAULIC POWER STATIONS

Units and Definitions - Internal Combustion Engines Operating and Testing - Fuels and Combustion - furnaces - steam Plants. Boiler. Economizer. super heater. air heater. Condenser - The steam Engine and the steam Turbine - Bernoulli`s Equation and its Applications (hydrodynamics) - Impact of Jets - Impulse Turbines - Reaction Turbines - Centrifugal Pumps - Reciprocating pumps - Pumps and Turbines performance.

533 ELECTRICAL MACHINES

The performance characteristics of the following:Performance magnetic systems - Energy conversion and reluctance motors - Three phase induction motor - Single phase induction motor - synchronous machines performance .

534 ELECTRICAL POWER ENGINEERING

Representation of power systems - power circle diagrams - Short circuits in electrical power systems - Economics of electrical power systems - and Load flow studies .

535 ENGINEERING MATHEMATICS

Fourier Series - Fourier Transform - Transmission Through Linear systems - Sampling theorem and TDM - Amplitude modulation - Frequency Modulation - Phase Modulation .

536 ELECTROMAGNETIC FIELDS

Special methods for solving the laplacian equation - Maxwell`s Equations and their application by slow varying fields - fast Varying fields.

537 HIGH VOLTAGE ENGINEERING

Generation of high voltages - Techniques of measuring high Voltages - Calculation and control of field stresses in high Voltage - equipments - Fencing, earthing and shielding of high Voltage arrangements.

538 APPLIED STATISTICS

Sets and Probability - Random Variable and Probability Distributions - Mathematical Expectation - Special Probability Distributions - Sampling theory - Estimation Theory -Tests of Hypothesis and Significance - Curve Fitting, Regression and Correlation - Analysis of Variance.

539 COMPUTER APPLICATION

Introduction to information engineering - Basics digital computer logic - combinational logic - sequential logic - arithmetic circuits - computer programming - the assembly language.

ELECTRICAL ENGINEERING

Third Year

Code No	Course Title	No. of Hrs/W			Maximum Mrks					Final exam Hours
		Lect.	Tut. Lab	Total	Fin. Exa.	Year`s Work	Mid Exa	Oral Exa.	Total	
530	Engineering Mathmatics	2	1	3	60	20	20	--	100	3
531	Automatdic Control	2	1	33	60	20	20	--	100	3
532	Heat and Hydr. Power Stations	3	1	4	60	20	20	--	100	3
533	Electrical Machines	2	2	4	60	10	20	10	100	3
534	Electrical Power Engineering	2	2	4	60	10	20	10	100	3
535	Electrical Communications	2	1	3	60	10	20	10	100	3
536	Electromagnetic Fields	2	2	4	60	20	20	--	100	3
537	High Voltage Engineering	2	1	3	60	10	20	10	100	3
538	Applied Statistics	2	1	3	60	20	20	--	100	3
539	Computer Applications	1	2	3	60	20	20	--	100	3
		20	14	34					1000	

ELECTRICAL ENG. DEPARTMENT
Fourth Year

S40 PRODUCTION SYSTEM ANALYSIS

Introduction - Types of Electrical Energy Production Systems - Inputs and outputs of Electrical Energy production Systems -Modeling of Electrical Energy production systems- Techno-economic Evaluation of Electrical Energy production systems - Optimum operation and control of Electrical Energy production systems .

S41 AUTOMATIC CONTROL

Frequency response methods - system compensation - microprocessor control fundamentals - Labwork and applications.

S42 ELECTRICAL POWER STATIONS

Introduction to electrical power generation - steam power stations - Hydro-power stations Nuclear power stations - Diesel power stations - Electrical Equipment of power stations - Operation of inter-connected stations - load sharing between stations - Management and control of power stations optimal operation of power stations - characteristics of power stations.

S43 THEORY AND DESIGN OF ELECTRICAL MACHINES

Concept of generalized-circuit theory of electrical machines - Dynamic performance of (DC machines - Synchronous machines - Induction machines) Electric Design Principles of (DC Machines - Synchronous machines - Induction machines - Electric power transformers) - Special DC-machines - Special AC-machines.

S44 PROTECTION SYSTEMS

Fault analysis by computer methods - Devices of power system Protection - Protection of transformer - Protection of Motors & Generator - Protection of Feeders - Protection of bus-bars Protection against lightning.

S45 POWER ELECTRONIC

Circuits with switches and diodes - power semiconductor switches - Thyristors - Ac voltage controllers - Rectifiers - Inverters - Labwork .

546 INDUSTRIAL RELATIONS

Introduction - safety Engineering - Human Relations - Behavior Science.

547 SPECIAL COURSE 1

Power Systems Analysis

Introduction - Network Topology and steady-state Formulation - Load-flow Studies - Stability studies - short-circuit studies - optimum operation of power systems.

Generalized machine theory

Elements of generalized circuit theory - Linear transformation in machines - D.C. machines - Commutator machines - transformation and transient analysis - A.C. primitive machines - 3phase induction and single and 3phase synchronous machines.

548 SPECIAL COURSE 2

Utilization of Electrical Energy

Industrial utilization of electric Motors - Electrical Heating and welding - Illumination systems and Design - Electrolytic Processes - Induction Heating - Dielectric Heating - Electrical Energy Management systems and conservation - Energy storage systems - cogeneration Technologies - Energy Auditing - Energy Accounting and analysis.

Electric traction

Introduction to traction system- train movement and energy consumption - typical speed time curve - general features of traction motors - characteristics of d.c. motors - three phase inductions motors - linear induction motors - speed control of d.c. motors and 3-phase induction motors - Braking system - mechanical concnteration and control equipment.

ELECTRICAL ENGINEERING

Fourth Year

Code No	Course Title	No. of Hrs/W			Maximum Mrks					Final exam Hours
		Lect.	Tut. Lab	Total	Fin. Exa.	Year`s Work	Mid Exa	Oral Exa.	Total	
540	Production System Analysis	2	1	3	60	20	20	--	100	3
541	Automatic Control	2	1	3	60	20	20	--	100	3
542	Electrical Power stations	2	3	5	60	10	20	10	100	3
543	Theory and Design of Elect. Machines	2	3	5	60	10	20	10	100	3
544	Protection Systems	2	1	3	60	20	20	--	100	3
545	Power Electronic	2	2	4	60	20	20	--	100	3
546	Industrial Relations	1	-	1	30	--	20	--	50	2
547	Special course1	2	1	3	60	20	20	--	100	3
548	Special course2	2	1	3	60	20	20	--	100	3
549	Project	2	2	4	90	30	--	30	150	
		19	15	34					1000	

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