BACHELOR OF ENGINEERING HONOURS IN ELECTRONIC ENGINEERING

COURSE SYNOPSIS

The purpose of the following course synopsis is to indicate the essential direction and broad scope of the content for each course.

PART I

SMA 1116 ENGINEERING MATHEMATICS 1A


TIE 1101 ENGINEERING DRAWING


TCE 1103 PROFESSIONAL ENGINEERING SKILLS I

Study methods; Communication principles; Technical definitions, Descriptions and instructions; Tables and graphs; Letters. Memoranda and Curricula Vitae; Written reports; Word processing and computer jargon; Interview technique; Running a meeting; Reading, understanding and summarizing technical articles.

TEE 1102 ELECTRICAL ENGINEERING WORKSHOP


TEE 1131 INTRODUCTION TO COMPUTER ENGINEERING AND PROGRAMMING

History of computers. Applications of computers. Hardware and software. Computer components: types of computer systems, system features, central processing unit, memory, the
mother board, the expansion bus, memory map. Storage devices. Operating systems: MSDOS, UNIX and Windows. Computer maintenance.

**TEE 1143 ELECTRICAL ENGINEERING CIRCUIT ANALYSIS**


**TEE 1154 PHYSICS FOR ELECTRONIC ENGINEERS**

Atomic arrangements, unit cell, crystal systems. Intrinsic and Extrinsic semiconductors. Contact phenomenon: P-N junction.

Applied mechanics. Statics: scalar and vector quantities, equilibrium, solution of pin jointed frames, stress and strain, pure bending theory, and pure torsion theory. Dynamics: kinematics, types and equations of motion, work done by a constant and a varying force, circular motion, rotational work, power and energy.

**SMA 1216 ENGINEERING MATHEMATICS 1B**


**CTL 1101 CONFLICT TRANSFORMATION AND LEADERSHIP**

**TEE 1213 ELECTRONIC ENGINEERING DEVICES AND CIRCUITS**


**TEE 1232 CAD FOR ELECTRONIC ENGINEERS**

**TEE 1231 SOFTWARE ENGINEERING**


**TEE 1202 ELECTRONIC ENGINEERING WORKSHOP**


**TEE 1214 DIGITAL ELECTRONICS**


**PART II**

**SMA 2116 ENGINEERING MATHEMATICS II**


**TEE 2142 ELECTRICAL MACHINES**

**TEE 2104 LABORATORY**

This consists of number of experiments carried out in the laboratories to support the lecture materials of the semester.

**TEE 2106 DESIGN AND PROJECT**

Design of a circuit/system related to the current theoretical subjects. Literature review on a given topic, design, computer simulating and practical test. Writing a technical report.

**TEE 2151 NETWORK THEORY**

Advanced circuit analysis: Applications of Laplace Transform, Fourier series and Fourier Transform to circuit analysis.

**TEE 2113 DIGITAL DEVICES AND SYSTEMS**


**TEE 2115 ANALOGUE ELECTRONICS I**


**TEE 2141 ELECTRICAL MEASUREMENTS**


**SMA 2217 ENGINEERING MATHEMATICS III**

**TEE 2212 ELECTRONIC DRIVES**


**TEE2204 LABORATORY**

This consists of number of experiments carried out in the laboratories to support the lecture materials of the semester.

**TEE 2255 THE PROFESSIONAL ENGINEER**


**TEE 2206 DESIGN AND PROJECT**

Design of a circuit/system related to the current theoretical subjects. Literature review on a given topic, design, computer simulating and practical test. Writing a technical report.

**TEE 2233 OBJECT ORIENTED PROGRAMMING**


**TEE 2256 ELECTROMAGNETIC THEORY**

TEE 2215 ANALOGUE ELECTRONICS II


PART III

SMA 3116 ENGINEERING MATHEMATICS IV


TEE 3151 DIGITAL SIGNAL PROCESSING

Analysis of continuous and discrete signals and systems. Fourier series and transforms. Laplace transforms, Z transforms, transfer functions, analysis of stability, probabilistic convolution, impulse response and transfer functions.

TEE 3104 LABORATORY

This consists of number of experiments carried out in the laboratories to support the lecture materials of the semester

TEE 3113 LINEAR INTEGRATED CIRCUITS


TEE 3122 COMMUNICATION ENGINEERING I

TEE 3133 SOFTWARE ENGINEERING APPLICATIONS

Databases. Data-oriented software development and implementation using SQL. Web development. Java programming.

TEE 3106 DESIGN AND PROJECT

Design of a circuit/system related to the current theoretical subjects. Literature review on a given topic, design, computer simulating and practical test. Writing a technical report.

TEE 3112 MICROPROCESSORS


TEE 3241 CONTROL ENGINEERING

Examples of controlled processes, objectives and terminology, open and closed-loop controllers. Modeling by transfer functions; Simple servomechanisms; derivation of transfer functions from specifications. Time and frequency–response specifications. Direct analysis and design; stability, Routh criterion. The ITAE and other performance criteria. Examples of servo design. Frequency-response analysis and design. Root-locus methods; system analysis and design.

TEE 3232 EMBEDDED COMPUTER SYSTEMS

Applications of embedded systems. Microcontrollers: memory maps, programming languages, I/O, timers, interrupts, hardware interfacing. Picocontrollers: memory maps, SFRs, stacks, programming languages, oscillator types, configuration fuses, watchdog timers, code protection.

TEE 3204 LABORATORY

This consists of number of experiments carried out in the laboratories to support the lecture materials of the semester.

TEE 3222 COMMUNICATION ENGINEERING II


TEE 3206 DESIGN AND PROJECT

Design of a circuit/system related to the current theoretical subjects. Literature review on a given topic, design, computer simulating and practical test. Writing a technical report.
TEE 3231 COMPUTER ARCHITECTURE AND OPERATING SYSTEMS


TEE 3255 ENGINEERING MANAGEMENT

Based on “Management by Engineers” by D. Johnson through group discussion and talks by external speakers. Centred on industrial organizations; reviews and performance measures, planning and managing change, development and motivating groups, leaderships and communication; financial management; business environment; companies; basic accounts.

PART IV

TEE 4000 INDUSTRIAL ATTACHMENT

Familiarization with actual plan organization and operations, training in practical engineering work for graduate engineers, exposure to as many of the following as possible; industrial management, plant maintenance, design and development, service/field engineering; working with planning, manufacturing, production and marketing departments, industrial research.

PART V

TEE 5003 HONOURS PROJECT

Selection of a problem, research, planning of possible solutions, selection of an optimal solution, acquisition of components, testing, construction of a prototype, writing of the final report.

TEE 5122 COMMUNICATION SYSTEMS PERFORMANCE

The concept of noise characterization and receiver performance. Overview of contemporary communication systems link budget. Random processes and spectral analysis: linear systems; the Gaussian random process; error probabilities for binary signaling; performance of baseband binary systems detection of band-pass binary signals.

TEE 5142 MODERN CONTROL ENGINEERING

TEE 5155 PROJECT MANAGEMENT

Project proposal writing- types of proposals; Project definition, life cycle, and systems approach; Project scoping, work definition, and work breakdown structure (WBS); Project time estimation and scheduling using GANTT, PERT and CPM. Project costing, budgeting, and financial appraisal; Project control and management, using standard tools of cost and schedule variance analysis; Project management use-case through practical, example projects; use of computers in project management, some software tools for PM e.g. MSProject; PM techniques e.g. PRINCE2.

TEE 5223 MOBILE COMMUNICATION SYSTEMS


TEE 5233 HIGH SPEED NETWORKS

A comprehensive view of high-speed LAN, MAN, and ATM technologies and standards. Evolution towards broadband integrated services digital network (B-ISDN).

TEE 5212 POWER ELECTRONICS APPLICATIONS


TEE 5222 RF AND MICROWAVE DEVICES AND CIRCUITS

Oscillators: Magnetrons, Gunn and Impatt diodes, Other group III-V semiconductor devices. Amplifiers: Bipolar Junction Transistors and GaAs. FET amplifiers, low noise broadband and power amplifier design. Mixers: the mixing process, noise and noise figure measurement, single ended, single balanced and double balanced mixers. Control Devices: P.I.N. diode modulators, switches and phase shifters.

TEE 5241 INDUSTRIAL CONTROL

Industrial control situations, process control; instrumentation, actuators, transducers and controllers; hybrid systems; time-domain analysis, state-space analysis, stability; computer control; system characterization, algorithm design, feedback control for digital systems, PLC applications.
TEE 5234 ADVANCED SOFTWARE ENGINEERING