B.Tech **ELECTRICAL ENGINEERING** (AKU Syllabus) SEMESTER-IV

MA 1x04 NUMERICAL METHOD & COMPUTATIONAL TECHNIQUE
L-T-P : 3-1-0 Credit : 4
1. Introduction to computer language : Machine language, assembly language, higher level language, compilers, problem solving using computer algorithm, flow chart, examples. **Lecture : 5**
2. C/C++ Programming : Constant & variables, arithmetic expression, I/O statement, specification statement, control statements, subscripted variables, logical expression, function and subroutines, examples of programming should include numerical as well as non numeric applications, matrix operations, searching , sorting etc. **Lecture : 15**
3. Iterative Techniques for solution of equations :
i. Solution of non linear equation - Simple iteration scheme, Bisection method, Regula-falsi method, Newton - Raphson method, Secant method, their rates of convergence, order of errors etc. **Lecture : 5**
ii. Solution of linear equation – Gaussian elimination, matrix inversion by Gaussian method, computation of determinants, Jacobi and Gauss Seidel iteration method. **Lecture : 4**
4. Polynomial approximation : Interpolation, several form of interpolating polynomials like Lagrangian interpolation of polynomial and Newtons forward and backward difference formula, curve fitting(least square) .
Lecture : 6
5. Numerical integration : Trapezoidal method, Simpson's rule, order of errors in integration. **Lecture : 4**
6. Solution of initial value problem : Euler's method, Runge-Kutta second order and fourth order methods, solution of boundary value problem - Finite difference method.
Text Books:
1. Numerical methods for scientific and engineering computations by M.K. Jain, S.R.K. Iyengar, and R.K.Jain, New Age International Publishers, New Delhi.
2. Introductory Method of Numerical Analysis by S.S. Sastry, Prentice Hall of India Pvt. Ltd.
Reference Books
1. Numerical Analysis in Engineering by Rama B. Bhat, S. Chakravarty, Narosa Publishing House.
2. Advanced Engineering Mathematics by E.Kreyszig, 8th edition by John Wiley & Sons, New York.

EC 1x02 DIGITAL ELECTRONICS L-T-P : 3-1-2 Credit : 5
1. Digital Principle : Analog vs Digital, Number system, Computer Codes, Digital Signals, Waveforms Positive and Negative logic, Logic Gate : basic, universal and others, Truth Table, Logic functions, IC Chips, Timing Diagram, Electrical analogy. **Lecture : 4**
2. Boolean laws and theorems : Logic functions, conversion of logic functions into truth table and vice versa. SOP and POS forms of representation, min terms and max terms, simplification of logic functions by theorems and Karnaugh's map, don't care conditions, design of special purpose computers and related practical problems. **Lecture : 5**
3. Analysis and synthesis of combinational logic circuits : Adder and substructures (look ahead adders), Multiplexers, de multiplexers, Encoders, decoders, code convertors, magnitude comparators, parity generators and
checkers. **Lecture : 6**
4. Integrated circuit logic families : RTL, DTL, TTL, CMOS, IIL/I2L (integrated injection logic & emitter coupled logic). **Lecture : 4**
5. Sequential circuit blocks and latches, flip flops- race around condition, master slave and edge triggered, SR, JK, D & T Flip Flop, shift registers, counters- synchronous and asynchronous: design of ripple counter.
Lecture : 10
6. Timing circuit : multi vibrators, mono stable and astable timer: LM555. **Lec: 4**
7. Use of building blocks in designing larger systems such as digital to analog converters(DAC) weighted resistors and r-2r , analog to digital(ADC)- comparator, counter and succession. **Lecture : 5**
8. Memories : static and dynamic RAMs, ROM, EPROM, EEPROM. **Lecture : 4**
Text Books :
1. Digital systems - Principles and Applications by Tocci, Widmar and Jain, Pearson
2. Digital fundamentals by Floyd And Jain, Pearson
Reference books :
1. Fundamentals of VHDL design by Stephen Brown and Zovenkeo Vraseseic, TMH
2. Introduction To Logic Design With Cd Rom by Alan B Marcovity, TMH,
3. Fundamentals Of Digital Logic With Verilog Design by Stephen Brown, TMH
4. Modern digital electronics by R.P Jain, TMH

EE 1x03 ELECTRICAL MACHINES-II
L-T-P : 3-0-3 Credit : 5
1. Synchronous Generator : Principle, construction and types of synchronous machines, Methods of excitation, Armature windings, EMF equation of Alternator, Armature reaction, testing(OC and SC test) Voltage regulation,
Phasor diagram. **Lecture : 9**
2. Two reaction : Theory Modified Phasor diagram, Power angle characteristics, Parallel operation. Effect of change of fuel supply and excitation on alternator connected to infinite bus , Cooling of synchronous Generator. **Lecture : 9**
3. Synchronous Motor : Principle of operation , equivalent circuit, effect of varying field current. V-curves, Inverted V-curves, Phasor diagram, starting of synchronous motors, hunting application. **Lecture : 8**
4. Single phase induction motors : Introduction, Working principle , double revolving field theory , Equivalent circuit, Starting method and Types of single phase Induction motors, Applications. **Lecture : 8**
5. Special motors : Single phase synchronous motors, Two phase AC Servo Motor, single phase series (universal) motor, stepper motor, Permanent magnet DC motor, etc, Applications. **Lecture : 8**
Text Books :
1. Electrical machines by Nagrath I.J. and Kothari D.P. TMH
2. Electrical machinery by Fitzgerald A.E. & Kingsley: TMH

EE 1x04 POWER SYSTEM – I L-T-P:3-1-0 Credit : 4
1. Distribution : Effect of system voltage on transmission efficiency, Single phase AC, 3 phase AC System, Choice of Conductor's Size, Choice of voltage, Radial and ring Feeders: Calculation of voltage drop in AC, Radial and ring system. **Lecture : 6**
2. Electrical Design : Calculation of inductance of conductor due to internal and external flux, Inductance of Single Phase System; Kin and proximity effects/ GMR of solid conductor, GMR of standard conductor, Mutual
GMD Inductance of opposite conductor lines, Inductance of 3-phase lines single circuit and double circuit, symmetrical spacing and unsymmetrical spacing, Inductance of bundled conductor system, Calculation of capacitance of single phase and 3-phase system, symmetrical and unsymmetrical spacing, single circuit and double circuit bundled conductor system, effect of earth on capacitance of line. **Lecture : 12**
3. Mechanical Design : Types of supports cross arms and conductors, Calculation of sag and tension, cases of unequal height of supports, Stringing chart, earth clearance of live conductors, vibration, dampers. . **Lecture : 6**
4. Performance of Lines : Short, medium and long lines, A.B.C.D, constants: regulations nominal and T equivalent pie and T representation, surge impedance, surge impedance loading of line, universal power circle
diagram, Lossless line. **Lecture : 10**
5. Underground Cables : Types, insulating materials, sed. Stress in isolation and capacitance inter sheath and capacitance grading, PF in cables capacitance of 3-core cables. Instantaneous and long time breakdown strength, dielectric losses, lionization, deterioration, Heat production, Sheath current, Thermal characteristics.
Lecture : 10
Textbooks:
1. Elements of Power System Analysis by Stevenson (McGraw Hill)
2. Modern Power System by N J Nagrath & Kothari (TMH)
3. Elective Power System by Soni, Bhatnagar & Gupta
Reference Books:
A Course in Electrical Power by Soni, Bhatnagar & GuptA
HS 1X01 ORGANIZATIONAL BEHAVIOR & INDUSTRIAL PSYCHOLOGY
L-T-P : 3-0-0 Credit : 3
1. Concept of organization & organizational Behavior. **Lecture : 2**
2. (a) Personality : meaning, concept , determinants, personality theories (psychoanalytic Theory, Trait Theory and Self Theory).
(b) Perception-meaning , concept, process of perception, significance of perception.
(c) Leaning- meaning, concept, nature, component of leaning process.
(d) Attitude- meaning, concept, factors in attitude formation, method of finding Employee's attitude.
(e) Value - Meaning and types, value and attitude – similarity and difference.
(f) Motivation- meaning, theory of motivation (Maslow's Theory & Herzberg's Theory). **Lecture : 11**
3. (a) Group & Group Dynamics - concept, importance, classification of groups , reason for group, formation, group cohesiveness.
(b) Team work :meaning , concept, types , creating, an effective team. **Lec : 4**
4. (a) Communication- concept, process, importance, barrier.

(b) Organizational conflict- meaning, concept, types, stages of conflict, resolution of conflict.
(c) Power & politics- nature and concept, Ethics of power & politics, types of power.
(d) Leadership- concept, qualities and functions of a leader, approaches to the analysis of leadership
Lecture : 8
5. Concept of organization theory, concept of organization structure, form of organizational structure,form of organizational culture. **Lecture : 7**
6. (a) Organizational effectiveness - concept , approaches, criteria of effectiveness.
(b) Organizational change - meaning, factors in Organizational change, process of planned change.
(c) Organizational Development - concept ,need of organizational development, difference between organizational development & management development. **Lecture : 7**
Text Books :
1. Organizational behavior by Stephen P. Robbin & Seema Sanghi- pearson
2. Organizational behavior by L.M. Prasad-S Chand & sons
Reference Book :
Organization behavior: managing people and organization by Gregory moorehead – Biztantra

HS 1×06 INDUSTRIAL ECONOMICS & ACCOUNTING
L-T-P : 3-1-0 Credit : 4
1. Various definitions of Economics : Nature of Economic Problem, Relation between science, Engineering. Technology & Economics **Lecture : 3**
2. Meaning of demand, Law of Demand, Elasticity of demand, Practical importance & application of the concept of elasticity of Demand **Lecture : 5**
3. Meaning of Production and factor of Production : Land, labor, Capital ,Entrepreneur & Organization – their Characteristics law of variable Proportion .Return to Scale **Lecture : 5**
4. Cost Analysis : Various concept of cost, Cost function, Short & Long run cost. Concept of Revenue ,Break- Even Analysis **Lecture : 5**
5. Meaning of Market : Type of market – Perfect completion, Monopoly ,Oligopoly ,Monopolistic competition ,Main feature of these market), Meaning of Supply and Law of Supply, R ole of Demand & Supply in price in prime determination imperfect t competition **Lecture : 7**
6. Engineering Economy :
(a) Simple and compound interest, Annuities, (b)Basic methods For making economy Studies - (i) Present worth method, (ii) Future worth method (iii)I.R.R method (c) Comparison of alternative – (i) Present worth method, (ii) Future Worth method (iii) I.R.R method. **Lecture : 7**
7. Accounting: Meaning Scope and Role of accounting , Accounting concept & Convention. Accounting as information System. Recording of transaction in journal and Ledgers. Trial –Balance, Preparation of final Account. **Lec : 9**
Text Book :
1. Modern Micro Economics by Theory - H.L.Ahuja-S.Chand
2. Advance Economic Theory by M .L.Jhingan- Konark Publication
3. Engineering Economics by Degarmo , Sullican & Canada –McMillan
4. Double Entry Book Keeping by T.S.Grewal –S .Chand
Reference Books :
1. Stonier & Hague by A test book of Economic Theory-Pearson
2. Industrial Organisation and Engg. Economics by Banga & Sharma