خواجہ معین الدین چشتی اردو، عربی-فارسی یونیورسٹی لکھنؤ

ख़्वाजा मुईनुद्दीन चिश्ती उर्दू, अरबी-फ़ारसी विश्वविद्यालय, लखनऊ

Khwaja Moinuddin Chishti Urdu, Arabi-Farsi University, Lucknow

(U.P. State Government University)
(Recognised U/S 2(f) & 12(B) of the UGC Act 1956 & B.Tech. approved by AICTE)

ENGINEERING CHEMISTRY
(AS-101)

Unit	Topic
I	**Chemical Bonding** Ionic bonding and Covalent Bonding, Valence Bond and Molecular orbital theories of bonding and its application to homonuclear and hetronuclear diatomic molecules, Bonding in metals, semiconductors and insulators, imperfections in solids.
II	**Polymers** Classifications of polymers, types of polymerization and their principles, structure-property relationship, preparation and application of some industrially important polymers (Natural rubber, Buna N, Buna S, Nylon 6, Nylon 66, Terylene, PVC, PVA, PF, UF, HDPE, LDPE). Molecular weight of Polymers. Orgonometallic compounds and applications in polymerization. Polymer materials of industrial importance, biopolymers.
III	**Water Chemistry** Sources and nature of impurities, characteristics of natural water, water treatment processes- Lime-soda, zeolite, ion-exchange resin, reverse osmosis. Municipal supplied water. Cement: Composition, production of cement and applications.
IV	**Fuels** Classification, calorific values, analysis of solid fuels, liquid fuels and its properties, refining, cracking and reforming of petroleum, knocking and octane and cetane rating, anti-knocking agents. Adsorption: Definition and classification of adsorption, adsorption of gases on solids, adsorption from solution, applications of adsorptions. Spectroscopy Elementary ideas and simple application of UV, IR and NMR spectral Techniques.
V	**Corrosion** Theories of corrosion, types of corrosion, its prevention and control. Lubricants- Definition, functions, mechanisms and classifications of lubricants, properties and testing of lubricants. Phase Rule Derivation of phase rule and its application to one component water system and Sulphur System.

Text/ Reference Books:

1. Applied Chemistry: A Text Book for Engineers and Technologists, Gesser, H.D. Publisher Springer.
2. Engineering Chemistry, Jain & Jain, DhanpatRai publishing Co., 2012, NewDelhi
3. Engineering Chemistry, Shashi Chawla, DhanpatRai publishing Co., 2012, New Delhi
4. Engineering Chemistry, Dara &Umage, Chand Publication Ltd. 2012, NewDelhi

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ENGINEERING PHYSICS
(AS-102)

Unit	Topic
I	**Special Theory of Relativity-** Frame of Reference, Galilean Transformation, Inertial and Non-inertial frames, Postulates of Special Theory of Relativity, Michelson-Morley Experiment Lorentz transformation of space and time, Length contraction, Time dilation, Simultaneity in relativity theory, Addition of velocities, Relativistic dynamics, Variation of mass with velocity, Equivalence of mass and energy, Momentum-energy transformation equations.
II	**Thermal Physics-** Maxwell-Boltzmann Law of distribution of molecular velocities, Evaluation of r.m.s velocity, average and most probable speeds, Mean free path, Transport phenomena in gases.
III	**Geometrical Optics-** Combination of thin lenses, Cardinal points of coaxial optical system of this lenses, thick lenses, location and properties of cardinal points, Newton's formula, graphical construction of images. Huygen's and Ramsden's eye pieces, Optical Instruments- Spectrometer, Sextant.
IV	**Physical Optics** Interference- Condition of observing interference. Production of interference fringes and determination of wavelength using Fresnel's Biprism. Stoke's treatment, Interference due to thin films. Wedge shaped films. Newton srings. Diffraction- Fresnel's Half Period Zone, Zone Plate, Fraunhofer's diffraction by single slit, double slit. Theory of plane transmission grating. Width of principal maxima. Rayleigh's criterion of limit of resolution. Resolving power of prism and grating. Polarisation- Unpolarised, polarized and partially polarized lights. Polarisation by reflection. Double refraction by uniaxial crystals, Nicol prism, Polaroids, Huygen's theory of double refraction. Half wave and quarter wave plates. Analysis of plane, elliptical and circularly polarized light. Optical activity. Fresnel's theory ofoptical Rotation, Specific rotation, Biquartz and Laurent half-shade polar meters. *
V	**Laser-** Characteristics of Laser light, Stimulated and spontaneous emission. Einstein's coefficients, Relative contribution of stimulated and spontaneous emissions, Population inversion, Laser emission, Ruby and He-Ne lasers, *Solid state lasers; applications of lasers.*

Text/ Reference Books:

1. R. Resnik, Introduction to Special Relativity, John Wiley & Sons, Inc(2005).
2. Ghatak, Optics, Tala McGraw-Hill,(2008).
3. E. Hecht, Optics,Addison-Wesley(2002).
4. Beiser, Concepts of Modern Physics, Tala McGraw-Hill,(2005).
5. Laud, Lasers and Non-Linear Optics, Wiley,(2003)

* *Please add part of electromagnetic theory, and Maxwell's equation and propagation.*

2

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ENGINEERING MATHEMATICS-I
(AS-103)

Unit	Topic
I	**Matrices (Linear Algebra)** Types of Matrices: Symmetric, Skew-symmetric and Orthogonal Matrices; Complex Matrices, Inverse and Rank of matrix using elementary transformations, Rank-Nullity theorem; System of linear equations, Characteristic equation, Cayley-Hamilton Theorem and its application, Eigen values and eigenvectors; Diagonalisation of a Matrix
II	**Differential Calculus- I** Introduction to limits, continuity and differentiability, Rolle's Theorem, Lagrange's Mean value theorem and Cauchy mean value theorem, Successive Differentiation (n^{th} order derivatives), Leibnitz theorem and its application, Envelope, Involutes and Evolutes, Curve tracing: Cartesian and Polar co-ordinates
III	**Differential Calculus-II** Partial derivatives, Total derivative, Euler's Theorem for homogeneous functions, Taylor and Maclaurin's theorems for a function of one and two variables, Maxima and Minima of functions of several variables, Lagrange Method of Multipliers, Jacobians, Approximation of errors.
IV	**Multivariable Calculus-I** Multiple integration: Double integral, Triple integral, Change of order of integration, Change of variables, Application: Areas and volumes, Center of mass and center of gravity (Constant and variable densities).
V	**Vector Calculus** Vector differentiation: Gradient, Curl and Divergence and their Physical interpretation, Directional derivatives, Tangent and Normal planes. Vector Integration: Line integral, Surface integral, Volume integral, Gauss's Divergence theorem, Green's theorem, Stoke's theorem (without proof) and their applications

Text/ Reference Books:

B. V. Ramana, Higher Engineering Mathematics, Tata McGraw-Hill Publishing Company Ltd., 2008.
B. S. Grewal, Higher Engineering Mathematics, Khanna Publisher, 2005.
R K. Jain & S R K. Iyenger , Advance Engineering Mathematics, Narosa Publishing House 2002.
N.P. Bali & Dr.Manish Goyal , Laxmi Publications Ltd.

Reference Books-

1.E. Kreyszig, Advance Engineering Mathematics, John Wiley & Sons, 2005.
2.Peter V. O'Neil, Advance Engineering Mathematics, Thomson (Cengage) Learning, 2007.
3.Maurice . Weir, Joel Hass, Frank R. Giordano, Thomas, Calculus, Eleventh Edition, Pearson.

ELEMENTARY MATHEMATICS-I
(AS-104)
(B. Tech. Biotechnology/Fashion Technology)

Unit	Topic
I	**Algebra** Fundamental Theorem of Algebra (without proof), solution of quadratic equations. Linear inequalities. Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables. Solution of system of linear inequalities in two variables - graphically.
II	**Arithmetic and Geometrical Progressions** Arithmetic progression (A.P.), general term of A.P., sum of a series in A.P., arithmetic mean (A.M.) Geometric progression (G.P.), general term of a G.P., sum of n terms of a G.P., sum of infinite terms in G.P., geometric mean (G.M.), relation between A.M. and G.M. Sum to n terms of the special series n, n_2 and n_3 in A.P.
III	**Coordinate Geometry** Straight Lines: Introduction, Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axes, point-slope form, slope-intercept form, two point form, intercepts form and normal form. General equation of a line. Distance of a point from a line, with numerical examples. Conic Sections: Sections of a cone: circle, ellipse, parabola, hyperbola and pair of intersecting lines. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle, with numerical examples.
IV	**Calculus I** Introduction, Definition of limit, continuity and differentiability, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric function, derivative ofcomposite functions, chain rule, derivatives of inverse trigonometric functions, exponential, logarithmic and parametric forms. Logarithmic differentiation. Derivative introduced as rate of change both as that of distance function and geometrically.
V	**Calculus II** Rolle's and Lagrange's Mean Value Theorems (without proof) and their geometric interpretations with illustrate examples. Applications of Derivatives: Applications of derivatives: rate of change, increasing/decreasing functions, tangents & normals, approximation and errors, maxima and minima of one variable. Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations).

Recommended Textbooks:

1. Mathematics - Textbook for class XI , NCERT Publication
2. Mathematics Part I - Textbook for class XII , NCERT Publication
3. Mathematics Part II - Textbook for class XII , NCERT Publication

Reference Books:

1. B.V. Rammana: Higher Engineering Mathematics (Tata MC graw Hill)
2. Glynjames: Advanced modern Engineering Mathematics (Pearson education

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COMPUTER FUNDAMENTAL AND PROGRAMMING IN C
(CS-101)

Unit	Topic
I	**Basics of Computer** Introduction to digital computer, basic operations of computer, functional components of computer. Classification of computers. Introduction to operating system: [DOS, Windows, Linux and Android] purpose, function, services and types. Number system: Binary, octal and hexadecimal number systems, their mutual conversions. Binary arithmetic. Basics of programming: Approaches to Problem Solving, Concept of algorithm and flow charts. Types of computer languages: - Machine Language, Assembly Language and High Level Language, Concept of Assembler, Compiler, Loader and Linker.
II	**Standard I/O in "C"** Fundamental data types- Character type, integer, short, long, unsigned, single and double floating point. Storage classes- automatic, register, static and external. Operators and expression using numeric and relational operators, mixed operands, type conversion, logical operators, bit operations, assignment operator, operator precedence and associatively. **Fundamentals of C programming** Structure of C program, writing and executing the first C program. Components of C language. Standard I/O in C.
III	**Conditional program execution** Applying if and switch statements, nesting if and else, use of break and default with switch, program loops and iterations: use of while, do while and for loops, multiple loop variables, use of break and continue statements. **Functions:** Introduction, types of functions, functions with array, passing values to functions, recursive functions.
IV	**Arrays** Array notation and representation, manipulating array elements, using multi dimensional arrays. Structure, union, enumerated data types
V	**Pointers** Introduction, declaration, applications File handling, standard C preprocessors, defining and calling macros, conditional compilation, passing values to the compiler.

Text book:

1. The C programming by Kemighan Brain W. and Ritchie Dennis M., Pearson Education.
2. How to solve it by Computer by R.J.Dromy
3. Complete refrence in C by Herbert Schield
4. Herbert Schield , Complete reference inC
5. Let US C by Yashwant Kanetkar (BPB Publication)

Reference book:

2. Computer Concepts and Programming in C by D.S. Yadav and Rajeev Khanna, New Age
3. Programming in ANSI C by E. Balaguruswamy, Tata McGraw-Hill

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PROFESSIONAL COMMUNICATION
(HS-101)

Unit	Topic
I	**Vocabulary Building** The concept of Word Formation, Root words from foreign languages and their use in English, Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives, Synonyms, antonyms, and standard abbreviations.
II	**Basic Writing Skills** Sentence Structures, Use of phrases and clauses in sentences, Importance of proper punctuation, Creating coherence, Organizing principles of paragraphs in documents, Techniques for writing precisely. Identifying Common Errors in Writing Subject-verb agreement, Noun-pronoun agreement, Misplaced modifiers, Articles, Prepositions, Redundancies, Clichés.
III	**Nature and Style of sensible Writing** Describing, Defining, Classifying, Providing examples or evidence, Writing introduction and conclusion.
IV	**Writing Practices** Comprehension, Précis Writing, Essay Writing. Business communication Business communication, writing business letters and applications, minutes and memorandum, resume writing.
V	**Oral Communication** (This unit involves interactive practice sessions in Language Lab) Listening Comprehension, Pronunciation, Intonation, Stress and Rhythm, Common Everyday Situations: Conversations and Dialogues, Communication at Workplace, Interviews, Formal Presentations. Corporate grooming Appearing for interview, corporate dressing and grooming, dining etiquette, communication media etiquette, ethics, exercise on ethical dilemmas, exercise on mock-interview.

Reference Books:

1. Practical English Usage. Michael Swan. OUP. 1995.
2. Remedial English Grammar. F.T. Wood. Macmillan.2007
3. On Writing Well. William Zinsser. Harper Resource Book.2001
4. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press.2006.
5. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press.2011.
6. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford UniversityPress

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ELECTRONICS ENGINEERING
(EC-101)

Unit	Topic
I	**Semiconductor materials and properties** Group-IV materials, Covalent bond, electron-hole concepts Basic concepts of energy bands in materials, concepts of forbidden gap Intrinsic and extrinsic semiconductors, donors and acceptors impurities
II	**Junction diode and diode applications** p-n junction, depletion layer, v- i characteristics, diode resistance, capacitance diode ratings (average current, repetitive peak current, non-repetitive current, peak-inverse voltage). **Diode Applications:** rectifiers (half wave and full wave), calculation of transformer utilisation factor and diode ratings, filter (C – filter), calculation of ripple factor and load regulation clipping circuits, clamping circuits.
III	**Breakdown diodes** Breakdown mechanisms (zener and avalanche), breakdown characteristics, zener resistance, zener diode ratings, zener diode application as shunt regulator.
IV	**Bipolar Junction Transistor** Basic construction, transistor action, CB, CE and CC configurations, input/output Characteristics, concept of Biasing of transistors-fixed bias, emitter bias, potential divider bias Transistor Amplifier, Graphical analysis of CE amplifier, concept of voltage gain, current gain, h-parameter model (low frequency). **Field Effect Transistor** JFET: Basic construction, transistor action, concept of pinch off, maximum drain saturation current, input and transfer characteristics, characteristics equation CG, CS and CD configurations, Introduction to self and fixed biasing MOSFFT: depletion and enhancement type MOSFET-construction, operation and characteristics. Computation of Av, Ri, Ro, of single FET amplifiers using all the three configurations.
V	**Operational Amplifiers** Concept of ideal operational amplifiers, ideal op-amp parameters, inverting, non-inverting and unity gain amplifiers, adders. **Switching theory and Logic design** Number systems, conversions of bases, Boolean algebra, Basic gates AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR, logic gates, concept of universal gate, Concept of K-Map.

Reference Books:

1. Boylestad and Nashelsky, 'Electronic Devices and circuits' PHI, 6e,2001
2. A Mottershead, 'Electronic devices and circuits'. PHI, 2000. 3. Morris Mano, 'Digital Computer Design', PHI,2003.
3. Milman&Halkias, Integrated Electronics, PHI,2005.

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CONCEPTS OF FASHION AND DESIGN
(FT-101)

Unit	Topic
I	Design types- natural, stylized, geometric, historic and abstract; garment design-structural, decorative and functional
II	Elements of Design –line, shape, form, size, colour, texture and pattern; principles of design – Harmony, Balance, Rhythm, Emphasis and Proportion;
III	Colour – definition; dimensions of colour-hue, value and intensity; colour categories and psychology - warm and cool colours; advancing and receding colours; colour theories – Prang colour system and Munsellcolour system; colour harmonies.
IV	Fashion – definition, tangibles and intangibles of fashion; fashion life cycle; fashion adoption theories
V	fashion terminology -street fashion, recurring fashion, mass fashion, fashion trend, fashion shows, style, chic, boutique, Haute Couture; role of a fashion designer. Introducing elements and principles of design in apparels.

TEXT BOOKS:

1. Suzanne G. Marshall and Hazel O. Jackson, "Individuality in Clothing and Personal Appearance", Prentice Hall, New Jersey, 2000, ISBN: 0023622008 / ISBN: 978- 0023622007.
2. Kathryn McKelvey and Janine Munslow, "Fashion Design: Process, Innovation and Practice", Blackwell Publishing, USA, 2005, ISBN: 978-0-470-65577-1.
3. Angel Fernandez and Gabriel Martin Roig, "Drawing for fashion designers", Anova books company ltd., UK, 2007, ISBN: 0713490756 / ISBN: 978-0713490756.

REFERENCES:
1. Diane T. and Cassidy T., "Colour forecasting", Blackwell Publishing, 2005, ISBN: 1405121203 / ISBN: 978-1405121200.
2. Elaine Stone and Jean A. Samples, "Fashion Merchandising", McGraw-Hill Book Company, 1985, ISBN: 0070617422.

CONCEPT OF AI, ML & FASHION DESIGN
(CS-102/202)

Unit	Topic
I	Design types- natural, stylized, geometric, historic and abstract; garment design- structural, decorative and functional.
II	Introduction: introduction of artificial intelligence, Foundation and history of Artificial intelligence, applications, intelligent agents, structure of agent, Data Science, AI and ML computer vision.
III	Machine learning: Supervised and unsupervised learning, reinforcement learning, Learning with complete data-Nearest neighbor, naïve bayes models, learning with hidden data-EM algorithms.
IV	Neural network: introduction, brain Physiology, Neuron model and Network Architecture.
V	Classifier: Decision Tree classifier, nearest neighbor (NN) rule, support vector machine, clustering: introduction, k-Means clustering.

TEXT BOOKS:

1. Suzanne G. Marshall and Hazel O. Jackson, "Individuality in Clothing and Personal Appearance", Prentice Hall, New Jersey, 2000, ISBN: 0023622008 / ISBN: 978-0023622007.

Text/Reference Books:

1. Artificial Intelligence: A Modern Approach, by Stuart Russell and Peter Norvig,
2. Artificial Intelligence by Eliane Rich, Kevin Knight and Shivashankar B Nair, McGraw-Hill
3. E Charniak and D McDermott, "Introduction to Artificial Intelligence", Pearson Education
4. Dan W. Patterson, "Artificial Intelligence and Expert Systems", Prentice Hall of India,

INTRODUCTION TO BIOTECHNOLOGY-I
(BT-101)

Unit	Topic
I	Overview of Biotechnology: Definition, Scope and Applications of Biotechnology
II	Fundamentals of Biology: Hierarchy of Living Organisms, Concept of Cell; Cellular architecture of prokaryotic & eukaryotic cells, plant cells and animal cells. Structure and function of plasma membrane, cell organelles and their function.
III	Basics of Biochemistry: Basic chemical constituents of living body, Biomolecules, Types, Structure and Function of Macromolecules. General Characteristics and Classification of Enzymes.
IV	Fundamentals of Molecular Biology: Nucleic Acids as genetic material, Genes, Types of DNA and RNA, Their Structure and Function, Central Dogma of Molecular Biology, (Concept of Genetic Engineering) → T
V	Basic Techniques: Principles, Methods and Types of Electrophoresis and Centrifugation. ~~Uses~~ of ~~compound~~ microscopes in cellular studies, Autoradiography Roles

Staining, chromatography etc in cellular studies

Text Books:

1. Concepts in Biotechnology by D. Balasubramanian, C.F.A. Bryce, K. Jayaraman et al., Universities Press (2004)
2. Biotechnology: Expanding Horizons by B.D. Singh, Kalyani Publisher (2015)
3. Biotechnology by U. Satyanarayana and U. Chakrapani, Books & Allied Ltd (2008)

Reference Book:

Biology by Peter H Raven, George b Johnson, Kenneth A., Mason, Jonathan Losos, Susan Singer (McGraw Hill Publication)

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ENGINEERING MECHANICS
(ME-102)

Unit	Topic
I	**Introduction to Forces, Moments, Stresses and Strains:** Idealizations in Mechanics, Equilibrium of forces and moments, Free body diagram, Simple Stress and Strain, Axially loaded members and Hooke's law.
II	**Centroid & Moment of Inertia:** Introduction, Center of Gravity and Centroid, Moments of inertia -Area and Mass Moment of Inertia, Product of inertia, Principal axes and Principal moments of inertia, Transformation of Moment of Inertia.
III	**Structures:** Introduction, Classification, Analysis of Plane Trusses- Method of Joints, Method of Sections, Method of Tension Coefficients, Graphical Method, Beams- Shear force and Bending Moment Diagrams.
IV	**Friction:** Introduction, Laws of Coulomb friction, Angle offriction, Angle of Repose, Cone of Friction, Sliding and Rolling Friction, Rope and Belt Friction, Screw Friction, Wedge Friction.
V	**Kinematics and Kinetics of Rigid Bodies:** Introduction, Types of motions in plane and space, Rotation of rigid bodies, General Plane motion, D'Aiemberts Principle, Force, Mass and Acceleration, Work and Energy, Impulse and Momentum, Gyroscopic motion. **Vibration:** Introduction, Free and Forced Vibration, Vibration of rigid bodies.

Text/ Reference Books:

1. Beer F.P. and Johnston E.R., Mechanics for Engineers-Volume I -Statics, Volume-It - Dynamics, McGraw Hill, NewYork.
2. Merriam J.L and Kraige L.G., Engineering Mechanics, Volume 1-Statics, Volume-It - Dynamics, John Wiley & Sons, NewYork.
3. Shames L.H. Engineering Mechanics, Prentice Haii, NewDelhi.
4. R. C. Hibbler, Engineering Mechanics, Volt and II, Pearson Press,2002.

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ENVIRONMENTAL SCIENCE
(CE-101)

Unit	Topic
I	**Introduction** Introduction to environment science and its scope, Indian Scenario of Natural Resources, Conservation of natural resources. **Green Chemistry** Introduction, principles of Green Chemistry, atom economy. **Environmental Laws** Environmental laws/Acts, Environment protection Act- 1986, The Water Act- 1974, The Air Act- 1981. *Tribals and forestry Act in India*
II	**Ecosystem** Ecosystem and its basic concept, Structure and function of an ecosystem, Food chains, food webs and Ecological Pyramids, Ecological succession.
III	**Biodiversity** Biodiversity and its conservation, types of biodiversity, "Hot- spots" and threats to biodiversity, National and global scenario, Biodiversity conservation, *with special refrence*
IV	**Environmental Pollution** *to insitu & exsitu conservation, Alien species, ®* Environmental Pollution: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution and Nuclear hazards. *World Environment Day, World Ecology Day, Ozone Day*
V	**Social Issue** Sustainable development, Environmental ethics: Issues and possible solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents, Waste and reclamation.

® Red data book, Threatened species, IUCN (WWF)

Text/ Reference Books:

1. A Basic Course in Environmental Studies. Deswal&Deswal. Pub. DhanpatRai& Sons.
2. Environmental Studies. Bharucha. Pub. University ofPress
3. Ecology. Odum. Pub. Oxford &IBH
4. Environmental Engineering. Peany et.al. Pub. McGrawHill
5. A Text Book of Environmental Engineering Venugpal Rao. Pub.PHI
6. Environmental Science by Kaushik & Kaushik.

MANUFACTURING PROCESS
(ME-101)

Unit	Topic
I	**Concept of Manufacturing** Manufacturing definition; Role of materials, processes and systems in manufacturing; Classification and brief introduction of engineering materials such as metals & alloys, Ceramics and Glasses, and Plastics; Classification and brief introduction of manufacturing processes, Guide to processing of metals & alloys.
II	**Casting Processes** Elements of Green Sand Mould; Method of Preparation of Green Sand Mould; Casting Defects.
III	**Metalworking Processes** Classification of Metalworking Processes-brief introduction of bulk and sheet metal processes, Hot Vs Cold Working; Hot and Cold Rolling ; Types of Rolling Mills, Hot and Cold Forging, Hot and Cold Extrusion, Cold Drawing.
IV	**Machining Processes** Classification of machining processes & machine tools; Construction, Specification and Working of Lathe Machine and Drilling Machine; Study about Facing, Turning, Parting, Grooving, Threading and Knurling, and Drilling and other hole related operations.
V	**Fabrication Processes** Classification of Welding Operations, Types of Joints & Welding Positions; Brief description of Arc, Resistance and Gas welding techniques. Brazing and Soldering. Brief introduction of Newer Machining Processes EDM, ECM, USM, and LBM. Modern Trends in Manufacturing-Automation, Concept of CAD, CAM and CIM.

Text/ Reference Books:

1. Workshop Technology (Vol. I & II) by Hajra, Choudhury and Roy (Manufacturing Processes)
2. Workshop Technology by Khurmi and Gupta (ManufacturingProcesses)
3. Manufacturing Process by K.M. Moeed (Umesh publications)

خواجہ معین الدین چشتی اردو عربی-فارسی یونیورسٹی لکھنؤ

ख़्वाजा मुईनुद्दीन चिश्ती उर्दू, अरबी-फ़ारसी विश्वविद्यालय, लखनऊ

Khwaja Moinuddin Chishti Urdu, Arabi-Farsi University, Lucknow

(U.P. State Government University)
(Recognised U/S 2(f) & 12(B) of the UGC Act 1956 & B.Tech. approved by AICTE)

BASIC ELECTRICAL ENGINEERING
(EE-101)

Unit	Topic
I	**DC Circuits** Definitions and Terminology. Electrical circuit elements (R, L and C), voltage and current sources, Source Transformation, Stra-Delta Transformation, Kirchoff's current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Thevenin, Norton Theorems and Maximum Transfer Theorem.
II	**AC Circuits** Representation of sinusoidal waveforms, peak and rms values, Phasor Representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), Resonance: series and parallel. **Three-phase AC systems** Advantages of Three-phase system. Three-phase balanced circuits, voltage and current relations in star and delta connections, three phase power.
III	**Measuring Instruments** Types of measuring instruments. Construction and working principle of PMMC, MI, Electrodynamometer type instruments. Extension of range of instruments. Power System Introduction to power system and grid. Safety precautions and Earthig.
IV	**Magnetic Circuit** Definitions and terminology of magnetic circuits. Magnetic materials, BH characteristics, hysteresis loop. **Transformer** Principle and operation of transformer. Ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and its advantages.
V	**Electrical Machines** Principle of EMEC. Construction, working and characteristic of dc machines. EMF and Torque equation of DC machines. Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Construction and working principle of Single-phase induction motor, Loss components and efficiency, starting methods and speed control of induction motor. Construction and working of synchronous generators.

Suggested Text / Reference Books:

1. D.P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
2. D.C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
3. L.S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
4. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
5. V.D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.

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ENGINEERING CHEMISTRY LAB
(AS-151)

General introduction and description of Balance operation.

Volumetric titrations:

1 Determination of available chlorine in a supplied bleaching powder sample by iodometry.

1. Determination of type and extent of alkalinity in a supplied water sample by titrating with standard sulphuric acid solution.
2. Determination of total and permanent hardness in a supplied water sample by titrating with standard EDTA solution.
3. Determination of Ca" and Mg" hardness in a supplied water sample by titrating with standard EDTA solution.
4. Determination of Fe" in a supplied solution by titrating with standard K, Cr, O solution using ferrous ammonium sulphate as intermediate solution and diphenylamine as internal indicator.
5. Determination of Fe" in a supplied solution by titrating with standard K, Cr, O solution using ferrous ammonium sulphate as intermediate solution and Potassium Ferricyanide as external indicator.

Engineering experiments:

6. Determination offiash point of lubricating oil using Pensky-Martin's apparatus.
7. Determination offiash point of lubricating oil using Abel's apparatus.
8. Determination of aniline point of lubricating oil using Aniline point apparatus.
9. Determination of viscosity of lubricating oil using Redwood viscometer.
10. Determination of steam emulsion number of a lubricat ingoil.
11. Determination of viscosity of a solution containing polymer.

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ENGINEERING PHYSICS LAB
(AS-152)

List of Experiments

1. Height of a building by Sextant
2. Co-efficient of thermal conductivity of rubber by Lee's discmethod
3. Focal length of combination of two thin lenses by Nodal slideassembly
4. Determination of SaltzmanConstant
5. Interference of light: Newton'sring
6. Interference of light: Fresnel'sbiprism
7. Fraunhoffer diffraction: Doubleslit
8. Diffraction by a plane transmission grating
9. Specific rotation of sugar using Polarimeter
10. Specific resistance of a wire by Carry-Foster's Bridge
11. Verification of Stefan'slaw
12. Variation of magnetic field along the axis of a current carry ingcoil
13. Hysteresis loop for a ferromagnetic material (M·B)curve.
14. Determination of Plank's Constant.
15. Electromagnetic Induction.
16. To calculate the current and voltage sensitivities of a moving coil galvanometer.
17. To measure the Susceptibility of paramagnetic solution by Quinck's Tube Method.
18. To determine resistivity by four probe method.

ENGINEERING MECHANICS LAB (ME-151)

List of Experiments:

1. Determination of Coefficient of friction of Sliding boxes of different materials on wooden inclined plane.
2. Determination of Coefficient of friction of roller on wooden inclined plane.
3. Determination of Coefficient of friction between rope and a fixed pulley.
4. Determination of mass moment of inertia of a fly-wheel.
5. Determination of forces in fixed and moving arm of a truss.
6. Determination of velocity ratio, mechanical advantage and efficiency of a screw jack.
7. Verification of law of Polygon of forces.
8. Verification of resultant and moment of forces by parallel force apparatus.
9. Determination of velocity ratio, mechanical advantage and efficiency of worm and worm wheel.
10. Verification of law of parallelogram and triangle of forces.

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BIOTECHNOLOGY LAB
(BT-151)

Laboratory Work:

1. Introduction to Glasswares /Equipments& Pipetting Method
2. Preparation of Buffer Solutions
3. Standardization of pH meter
4. General Tests of Carbohydrates, Proteins/ Lipids
5. Enzymatic Activity on Starch
6. Estimation of ketone bodies, bile salts/ bile pigments
7. Quantitative Estimation of Biomolecules (Carbohydrates/ Proteins/DNA)

BASIC ELECTRONICS LAB
(EC-151)

List of Electronics Experiments

1. (a) Study of Electronic components and equipment's
   Measurement of Resistor using color coding
   (b) Assembling electronic components on bread board.
2. To study of V - I Characteristics of Si diodes
3. To study of V - I Characteristics of Ge diodes
4. To study a half wave rectifiercircuit.
5. To study a full wave rectifiercircuit.
6. To study of Zener Diode characteristics.
7. Study of characteristics of Zener Diode as constantvoltage.
8. Verification of Application of Zener Diode as shuntregulator.
9. Determination of ripple factor of capacitive and non capacitive filter for HW and FW diode rectifier circuit.
10. Study of Clipper and Clamper Circuit with differentwaveforms.
11. Determination of Characteristics of BJT in Common Emitter Configuration
12. Determination of characteristics of BJT in Common Baseconfiguration.
13. Determination of characteristics of FET in CS and CDconfiguration.
14. Study of BJT as single stage amplifier and determination of Ai, Vi, Ri andRo.
15. Verification of logic OR, NOT, AND gates
16. Verification of Universalgates.

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COMPUTER PROGRAMMING LAB
(CS 151/251)

1. WAP that accepts the marks of 5 subjects and finds the sum and percentage marks obtained by the student.
2. WAP that calculates the Simple Interest and Compound Interest. The Principal, Amount, Rate of interest and Time are entered through the keyboard.
3. WAP to calculate the area and circumference of a circle.
4. WAP that accepts the temperature in Centigrade and converts into Fahrenheit using the formula $C/5=(F-32)/9$.
5. WAP that swaps values of two variables using a third variable.
6. WAP that checks whether the two numbers entered by the user are equal or not.
7. WAP to find the greatest of three numbers.
8. WAP that finds whether a given number is even or odd.
9. WAP that tells whether a given year is a leap year or not.
10. WAP that takes two operands and one operator from the user and perform the operation and prints the result by using Switch statement.
11. WAP to print the sum of all numbers up to a given number.
12. WAP to find the factorial of a given number.
13. WAP to print sum of even and odd numbers from 1 to N numbers.
14. WAP to print the Fibonacci series.
15. WAP to check whether the entered number is prime or not.
16. WAP to find the sum of digits of the entered number.
17. WAP to find the reverse of a number.
18. WAP to print Armstrong numbers from 1 to 100.
19. WAP to convert binary number into decimal number and vice versa.
20. WAP that simply takes elements of the array from the user and finds the sum of these elements.
21. WAP that inputs two arrays and saves sum of corresponding elements of these arrays in a third array and prints them.
22. WAP to find the minimum and maximum element of the array.
23. WAP to search an element in a array using Linear Search.
24. WAP to add and multiply two matrices of order NxN.
25. WAP that finds the sum of diagonal elements of a MxN matrix.
26. WAP to implement strlen (), strcat (),strcpy () using the concept of Functions.
27. WAP to swap two elements using the concept of pointers.
28. WAP to compare the contents of two files and determine whether they are same or not.
29. WAP to check whether a given word exists in a file or not. If yes then find the number of times it occurs

ENGINEERING GRAPHICS LAB
(ME152/252)

1. Introduction to engineering graphics, basics of sheet sizes and choice of scale, title block, types of lines & geometric constructions, proper layout (spacing) of problems on the drawing sheet. Lettering, dimensioning details.
2. Orthographic projection of points, projection of lines, Orthographic views.
3. Sectioning of solids.
4. Details of fasteners (e.g. bolt, nut, stud, screw etc), terminology of threads, types (e.g. V, square, acme, single/multi start, left/right handed etc).
5. Elementary idea of joints (e.g. riveted, welded, soldered, adhesive etc), other joints (like cotter, knuckle etc.) along with their relative advantages and disadvantages and application areas, various couplings and their applications.
6. Introduction to Modelling Software.

Text/ Reference Books:

1. Machine drawing, by K.L.Narayana, P. Kannaiah&K.Venkata Reddy New Age Internationalpublishers.
2. Machine Drawing includes AutoCAD, by AjeetSingh,Tata McGraw Hill Publishing CompanyLtd.
3. Elementary Engineering Drawing, by Bhatt ND, CharotarPublishing.
4. Machine Drawing by Bhatt N D CharotarPublishing.
5. Engineering Drawing, by M. B. Shah & B. C. Rana Pearson EducationIndia.
6. Engineering Drawing, by Jolhe D.A. Tata McGraw HillEducation.

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ELECTRICAL LAB
(EE151/ 251)

List of Electrical Experiments

1. To verify KCL and KVL
2. To verify Thevenin's theorem.
3. To verify Superposition theorem.
4. To verify Norton's Theorem.
5. To verify Maximum power transfer theorem.
6. Study of phenomenon of resonance in RLC series & parallel circuit.
7. Measurement of power in a three phase circuit by two wattmetermethod.
8. Measurement of efficiency of a single phase transformer by loadtest.
9. Determination of parameters and losses in a single phase transformer by OC and SC test.
10. To study speed control of DC shunt motor using (i) armature voltage control (ii) Field flux control.
11. Study running and reversing of a three phase inductionmotor.
12. Study of a single phase energymeter.

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WORK SHOP PRACTICES
(ME151/251)

1. Manufacturing Methods- casting, forming, machining, joining, advanced manufacturing methods.
2. CNC machining, Additive manufacturing
3. Fitting shop operations & power tools
4. Black smithy shop.
5. Carpentry shop
6. Plastic moulding, glass cutting
7. Metal casting
8. Welding shop (arc welding & gas welding)
9. Sheet metal shop

Suggested Text/Reference Books:

1. Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited,Mumbai.
2. Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology", 4th edition, Pearson Education India Edition,2002.
3. Gowri P. Hariharan and A. Suresh Babu, Manufacturing Technology – I Pearson Education,2008.
4. Roy A. Lindberg, "Processes and Materials of Manufacture", 4th edition, Prentice Hall India,1998.
5. Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGrawHill House, 2017.