### B.Tech First Year Scheme

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Total Contact Hours (L + T + P) 27

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Total Contact Hours (L + T + P) 26

(Directorate of Academics)
FIRST SEMESTER

MA1101: ENGINEERING MATHEMATICS – I [3 1 0 4]

References:
3. Lay David C., Linear Algebra and applications, (3e), Pearson Education, 2009

PY1001: Engineering Physics [3 1 0 4]
Optics: Two source interference, double slit interference, coherence, intensity in double slit interference, thin film interference, air-wedge, Newton’s rings, Michelson’s interferometer, diffraction and wave theory of light, single-slit diffraction, intensity in single-slit diffraction (using phasor method), diffraction at a circular aperture, double-slit interference and diffraction, combined-intensity in double-slit diffraction (qualitative approach), diffraction of light through multiples slits, diffraction gratings, dispersion and resolving power of gratings, polarization of electromagnetic waves, polarizing sheets, polarization by reflection, double refraction; Quantum Physics: Black body radiation and Planck’s hypothesis, Stefan’s Law, Wein’s displacement law, Photoelectric effect, Compton effect, photons and electromagnetic waves, wave properties of particles, de Broglie hypothesis, Davisson-Germer experiment, quantum particle (wave packet, phase velocity, group velocity), the uncertainty principle; Quantum Mechanics: An interpretation of quantum mechanics, wave function and its significance, Schrödinger equation, particle in a box, particle in a well of finite height (qualitative), Tunneling through a potential barrier and its applications, the simple harmonic oscillator (qualitative); Atomic Physics & Molecular Physics: Atomic spectra of gases, energy states and spectra of molecules (rotational and vibrational energy levels), X-rays spectrum, Moseley’s law, spontaneous and stimulated transitions, He-Ne and Ruby laser, application of lasers; Solid State Physics: band theory of solids, electrical conduction in metals, insulators and semiconductors, Superconductivity, type-I and type-II superconductors, Meisner effect, BCS theory (Introductory) and applications of superconductivity.

References:

CV1001: BASIC CIVIL ENGINEERING [2 1 0 3]

References:

CY1002: ENVIRONMENTAL STUDIES [3 0 0 3]
Meaning, multidisciplinary nature of environmental science, applications in engineering disciplines, environmental ethics, sustainable development, Natural (renewable and non-renewable) resources, Resource consumption, Biodiversity and conservation methods, different types of energy, Conventional sources & Non-Conventional sources of energy, Types and Structure of Ecosystem, Environmental Pollution and control, Disaster Management meaning, natural disasters especially earthquakes & Manmade disasters, Environmental Engineering:- Water demand, Water quality standards, basics of water treatment, Conservation of water, Characteristics of sewage, treatment and disposal, Environmental crisis & legislations, Environmental acts, Laws and Policies, EIA, Case studies of the past related to environmental issues, crisis, disasters, hazard, pollution, climate change & its effects, Practical activity related to environmental problems and its impacts on environment.

References:

EC1001: BASIC ELECTRONICS [2 1 0 3]

References:
5. B. L. Thereja, Basic Electronics: Solid state, (5e), S. Chand Publication, 2005

ME1002: ENGINEERING GRAPHICS [0 0 6 3]

References:

**PY1030: Engineering Physics Lab [0 0 2 1]**
Experiments on interference, diffraction and dispersion, experiments on quantum theory of radiation, Experiments on band theory of solids, semiconductors, Experiments on resonance circuits, Hall-effect.

**References:**

**ME1030: Workshop Practice [0 0 2 1]**

**References:**

**SECOND SEMESTER**

**MA1201: ENGINEERING MATHEMATICS – II [3 1 0 4]**

**References:**

**CY1001: ENGINEERING CHEMISTRY [2 1 0 3]**

References:

**EE1001: BASIC ELECTRICAL TECHNOLOGY [2 1 0 3]**

DC circuits, Independent sources, Resistance, Network reduction techniques, Mesh and Node voltage analysis, Superposition, Thevenin's and Maximum power transfer theorems, Transient behavior of inductance and capacitance, Self and Mutual inductances, Coupled coils, Dot rule, Average and RMS values of sinusoidal waves, Series and Parallel AC circuits, Phasor Analysis, Power factor improvement, Series and Parallel resonance, Three phase star and delta connected loads, Measurement of power in three phase circuits, Electrical power system, EMF Equation, Construction & Types of Transformers, DC motors, BLDC motors, Induction motors, Synchronous motors, Stepper motors, Fundamentals of Electrical Measuring Instruments.

References:

**CS1001: PROBLEM SOLVING USING COMPUTERS [2 1 0 3]**

Introduction to computing, Importance of Problem solving using computers, Algorithms and Flow charts, Introduction to C language, Simple C programs, Syntax and Logical Errors in compilation, Object and executable code, Variable names and declaration, Data types, Sizes and Constants, Various operators, Type conversion and expressions, Precedence and order of evaluation, Statements and blocks, Control, flow, Break and continue, 1-D and 2-D Arrays and Strings, Searching and Sorting, Multidimensional Arrays and Matrices, Modular programming and Recursive functions, Structure and Pointers, Defining Structures and Array of Structures, Pointer arithmetic, Pointer to Structures, File Management.

References:

**ME1001: Basic Mechanical Engineering [2 1 0 3]**


References:
3. Sereop Kalpakjian and Steven Schmid, *Manufacturing Engineering and Technology*, (7e), Prentice Hall,

**LN1001: COMMUNICATION SKILLS IN ENGLISH [2 0 0 2]**
Communication: Definition, process, features, types, modes, and barriers; LSRW Skills- Listening: Listening to groups and individuals- active listening, response, and feedback; comprehending conversations and lectures; Reading: Analysis of passages; skimming and scanning; contextual meaning; advanced vocabulary; Writing: Paragraph writing; Writing Creative and Critical responses; Formal letters; Emails; Résumés; Statement of Purpose; Speaking: Presentation, Discussion, and Debate on current affairs, scientific enquiry, philosophical attributions, literary sensibilities, socio-political awareness, and cultural sensitivity; Telephonic Etiquettes; Role Play; Team Work; Time Management; Grooming; Exploring multiple perspectives- critical reasoning, constructive feedback, persuasive arguments, and effective interpersonal communication.

**References:**

**CS1030: PROBLEM SOLVING USING COMPUTERS [0 0 2 1]**
Introduction to Computing, Simple C programming, Branching Control Structures, Looping Control Structures, 1D and 2D Array programming, String programming, Modular and Recursive Function Programming – Programs using Pointers, Structures and File manipulation.

**References:**

**CY1030: ENGINEERING CHEMISTRY LABORATORY [0 0 2 1]**
Alkalimetric titration; Redox titration; Estimation of total hardness of water; pH value of an acid by pH-metric titration; Conductometric acid base titrations; pH Metric acid base titrations; Synthesis of a resin; Determination of coefficient of viscosity of liquid; Determination cloud and pour point of a given sample of lubricating oil using cloud and pour point apparatus; Determine the water equivalent of bomb calorimeter using benzoic acid as fuel.

**References:**

**DA1001: Experiential Learning [0 0 4 2]**
The course will be conducted by various engineering departments and will facilitate branch specific experience based learning for students.