



SurTech

DR. SUDHIR CHANDRA SUR INSTITUTE OF TECHNOLOGY AND SPORTS COMPLEX
(Formerly known as Dr. Sudhir Chandra Sur Degree Engineering College)

COs for B.Tech. 1st Year (1st & 2nd Semester)



SurTech

1st Semester

Mathematics-IA (BS-M 101)

BS-M 101	COURSE OUTCOMES
BS-M 101.1	Apply the concept and techniques to differential and integral calculus to determine curvature and evaluation of different types of improper integrals.
BS-M 101.2	Explain the domain of applications of mean value theorems to engineering problems.
BS-M 101.3	Learn different types of matrices, concept of rank, methods of matrix inversion and their applications.
BS-M 101.4	Understand linear spaces, its basis and dimension with corresponding applications in the field of computer science.
BS-M 101.5	Develop the concept of Eigen values, Eigen vectors, Diagonalization of matrices and orthogonalization in inner product spaces for understanding physical and engineering problems.

Mathematics-IB (BS-M 102)

BS-M 102	COURSE OUTCOMES
BS-M 102.1	Apply the concept and techniques of differential and integral calculus to determine curvature and evaluation of different types of improper integrals.
BS-M 102.2	Understand the domain of applications of mean value theorems to engineering problems.
BS-M 102.3	Learn the tools of power series and Fourier series to analyze engineering problems and apply the concept of convergence of infinite series in many approximation techniques in engineering disciplines.
BS-M 102.4	Apply the knowledge for addressing the real-life problems which comprise of several variables or attributes and identify extremum points of different surfaces of higher dimensions.
BS-M 102.5	Analyze the concept of rank-nullity, eigen values, eigen vectors, diagonalization and orthogonalization of matrices for understanding physical and engineering problems.

Physics-I (BS-PH 101)

BS-PH 101	COURSE OUTCOMES
BS-PH 101.1	Learn basic concepts of quantum physics, simple quantum mechanics calculations; Macrostate, Microstate, Density of states, Qualitative treatment of MB, FD and BE statistics.
BS-PH 101.2	Solve problems including constraints & friction. Basic ideas of vector calculus and partial differential equations. Harmonic oscillator. Damped harmonic motion forced oscillations and Resonance. Motion of a rigid body.
BS-PH 101.3	Apply the wave properties of light Interference, Diffraction and Polarization; Lasers: Principles and working of laser to solve real life problem
BS-PH 101.4	Understand Maxwell's equations. Polarization, Dielectrics; Magnetization, magnetic-hysteresis.



Basic Electrical Engineering (ES-EE 101)

ES-EE101	COURSE OUTCOMES
ES-EE101.1	Describe fundamentals of DC and AC circuits.
ES-EE101.2	Explain the operating principle of transformer.
ES-EE101.3	Illustrate construction, working of Electrical Machines.
ES-EE101.4	Classify different power converters and installation process.

Physics-I Laboratory (BS-PH 191)

BS-PH 191	COURSE OUTCOMES
BS-PH 191.1	Observe and read data in slide calliper's, screw gauge. Calculate different modulus of elasticity to apply basic knowledge Physics of Elasticity and apply viscosity principle of streamline motion of water to calculate its viscosity coefficient required in fluid mechanics.
BS-PH 191.2	Operate optical instruments to illustrate physical properties of light and to observe spectral lines of light to verify medium specific characteristics. Calculate Rydberg constant by studying Hydrogen spectrum to visualize visible spectra and to assess this empirical fitting parameter as a fundamental physical constant.
BS-PH 191.3	Determine Band Gap and Hall coefficient of a given intrinsic semiconductor and distinguish between different intrinsic semiconductors. Determine the dielectric constant of different capacitors to correlate their usage like insulator and limitation of their usage as a dielectric material.
BS-PH 191.4	Determine Planck's constant and Stefan's constant applying modern Physics.

Basic Electrical Engineering Laboratory (ES-EE 191)

ES-EE 191	COURSE OUTCOMES
ES-EE 191.1	Identify different instruments and cut section of different machine
ES-EE191.2	Describe the steady -state and transient behavior of RLC circuits.
ES-EE191.3	Calculate the power of 3-ph system by two wattmeter
ES-EE191.4	Analyze different characteristics of transformer & DC machines

Workshop Practices (ES-ME 192)

ES-ME 192	COURSE OUTCOMES
ES-ME 192.1	Identify and operate various hand tools related to variety of manufacturing operations
ES-ME 192.2	Fabricate simple components with their own hands.
ES-ME192.3	Apply practical knowledge of the dimensional accuracies and tolerances applicable for different manufacturing processes.
ES-ME192.4	Produce small devices of their interest in project or research purpose.



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2ND Semester

Mathematics-IIA (BS-M 201)

BS-M 201	COURSE OUTCOMES
BS-M 201.1	Learn the ideas of probability and random variables, calculate probabilities using conditional probability, rule of total probability and Bayes' theorem.
BS-M 201.2	Illustrate the Various discrete and continuous probability distribution with their properties and their applications in physical and engineering environment.
BS-M 201.3	Understand the basic ideas of statistics with different characterization of a univariate and bivariate data set.
BS-M 201.4	Apply statistical tools for analyzing data samples and drawing inference on a given data set.

Mathematics-IIB (BS-M 202)

BS-M 202	COURSE OUTCOMES
BS-M 202.1	Understand multiple integrals and use their applications to different physical problems.
BS-M 202.2	Analyze different techniques to solve first and second order ordinary differential equations with its formulation to address the modelling of systems and problems of engineering sciences
BS-M 202.3	Learn different tools of differentiation and integration of functions of a complex variable that are used with various other techniques for solving engineering problems.
BS-M 202.4	Apply different types of transformations between two 2- dimensional planes for analysis of physical or engineering problems.

Chemistry-I (BS-CH 201)

BS-CH201	COURSE OUTCOMES
BS-CH201.1	Analyze microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces and list major chemical reactions that are used in the synthesis of drug molecules.
BS-CH201.2	Rationalize bulk properties and processes using thermodynamic considerations, corrosion and water chemistry, electrochemistry, acid base theory, Knowledge of stereochemistry for understanding mechanism of the major chemical reaction.
BS-CH201.3	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques like IR, UV, NMR that is usable in structure elucidation and characterization of various molecules.
BS-CH201.4	Understand the periodic properties such as ionization potential, electron affinity, electronegativity, polarizability, thermal stability and determination of shape of molecule.



English (HM-HU 201)

HM-HU201	COURSE OUTCOMES
HM-HU201.1	Learn and revise basic grammar of English language.
HM-HU201.2	Understand appropriate use of English language to enhance knowledge on building vocabulary and framing sentences.
HM-HU201.3	Develop sensible style in technical writing.
HM-HU201.4	Apply expertise in reading, writing, listening and speaking to attain proficiency in English language and communication.

Programming for Problem Solving (ES-CS 201)

ES-CS 201	COURSE OUTCOMES
ES-CS 201.1	Describe the meaning of system of numbers, logic gates and the basic anatomy of a computer.
ES-CS 201.2	Understand the inherent meaning of the basic elements of C Programming Language like; constants, variables, operators, operator precedence etc., and identify the use of data types and C statements and classify the statements.
ES-CS 201.3	Organize the statements in appropriate order to prepare a complete program that solves a specific problem and analyze a program to point out the bugs that might be present in it and change it to achieve the goal.
ES-CS 201.4	Construct the final program and create the executable module for execution purpose.

Chemistry-I: Laboratory (BS-CH 291)

BS-CH 291	COURSE OUTCOMES
BS-CH 291.1	Use modern instrumentation and classical techniques like viscometer, stalagmometer, pH-meter, potentiometer and conductometer etc. to design experiments and to properly record the results of their experiments to achieve high accuracy.
BS-CH 291.2	Separate the mixture of amino acids by TLC and analysis of chemical salts by qualitatively.
BS-CH 291.3	Estimate the quantitative analysis of Dissolved oxygen, chloride ion and removal of hardness of water etc. which are required to determine the usability of water used in industries.
BS-CH 291.4	Understand the miscibility of solutes in various solvents required in paint, emulsion and material industries and determine the acid value of an oil, kinetics of oxidation of iodide by hydrogen peroxide.