SYLLABUS FOR LAB ASSISTANT

(CHEMICAL ENGINEERING)

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SYLLABUS FOR LAB ASSISTANT IN CHEMICAL ENGINEERING

Heat Transfer : Fundamental of Heat Transfer, Equipment set-up and maintenance, Conduction Convection, Radiation, Heat Exchanger, Evaporation.

Fluid Flow Operation : Fundamentals of Fluid Mechanics, Equipment set-up and maintenance, Newton's law of Viscosity, Newtonian and non-Newtonian fluids, Surface-tension, Pressure and pressure measurement, Buoyancy, Conservation of mass, momentum and energy, Continuity and Bernoulli equation and its applications, Laminar and turbulent flow, Friction factor, Venturi meter, Orifice meter, Pilot tube, Rota meter, Pump, Cavitation.

Mass Transfer : Equipment set-up and maintenance, Molecular Diffusion in Fluids-Steady state molecular diffusion in fluids at rest, Equipment for Gas-Liquid Operations-Tray towers, Packed towers, Humidification Operations, Gas Absorption- Equilibrium solubility of gases in liquids, Countercurrent multistage operation; one component transferred, Continuous contact equipment, Distillation- Vapor-liquid equilibria, Single-stage operation- flash vaporization, Differential, or simple distillation Continuous rectification- Binary systems, Mc Cabe Thiele Method Liquid Extraction- Differential (continuous-contact) extractors, Adsorption and Ion Exchange-Liquids, Continuous contact, Drying-Batch drying, The mechanisms of batch drying, Leaching-state operatio.

Instrumentation and Process Control : Influence of external disturbances, Variables in a chemical processes, control aspect of chemical plant, Laplace transformation, First order system, dynamics of feedback controllers, Equipment set-up and maintenance, Introduction to Instrumentation, Temperature Measuring Devices, Measurement of Pressure & amp; Vacuum, Measurement of Head and Level, Process Recording Instruments.

Reaction Engineering : Introduction to reaction engineering, Equipment set-up and maintenance, Kinetics of homogeneous reaction, Interpretation of ideal and non-ideal reactor data, Introduction to reactors in series, Batch reactor, CSTR, PFR and Semi-batch reactor, RTD.

Engineering Measurements : Introduction of Physical Quantities and Units, Linear Measurements, Precision Measurements, Measurement of Area, Measurement of Electrical Energy, Measurement of frictional coefficient, Measurements of volumetric flow rate & Mass flow rate, Measurement of PH, Measurement of hardness of water, Measurement of Specific Gravity, Measurement of Viscosity.

Process Calculations : Introduction, Basic Chemical Calculation, Material Balance with and without chemical reaction, Energy Balance, Combustion, Ideal gas law.

Mecanical Operation : Introduction and concepts of Mechanical Operations, particulate solids, Screen Analysis, Size Reduction, Sedimentation, Filtration, Agitation and Mixing, Equipment set-up and maintenance.

Industrial Safety and Environmental Engineering : General Introduction & Concept of Safety, Chemical & Fire Hazards & ther Control, Other hazards & occupational disease, Personal Protective Device, Introduction to pollution, Air Pollution, Water Pollution Solid waste of disposal.

Plant Utilities and Energy Engineering : Introduction, Conventional fuels, Non-conventional sources of energy, Water Steam, Air & Refrigeration, Equipment set-up and maintenance.

Computer Awareness : Applications of computers in Chemical Instrumentation and Process Control, Basic knowledge of Computer Applications viz. MS Word, MS Excel, Power Point etc. Internet, Windows.

Communication skills : English grammar, vocabulary, oral and written communication.

30/09/2024

CHAITANYA KUMAR

GPP7.