

BIJU PATNAIK UNIVERSITY OF TECHNOLOGY, ORISSA

Chemical Engineering.

3rd Semester					4th Semester				
Theory Code	Subject	Contact Hours		Credit	Theory Code	Subject	Contact Hours		Credit
		L	T-P				L	T-P	
BSCM1205	Mathematics - III	3	0-0	4	BSCM1210	Mathematics - IV	3	0-0	4
BSCC1208	Chemistry – II	3	0-0	3	BSMS1209	Material Science	3	0-0	3
	OR					OR			
BSMS1209	Material Science				BSCC1208	Chemistry – II			
BECS2212	C++ & Object Oriented Programming	3	0-0	3	BSCS2208	Database Management System	3	0-0	3
HSSM3204	Engg. Economics & Costing	3	0-0	3	HSSM3205	Organisational Behavior	3	0-0	3
	OR					OR			
HSSM3205	Organisational Behavior				HSSM3204	Engg. Economics & Costing			
PCCH4201	Fluid Flow & Flow measurement	3	0-0	3	PCCH4203	Chemical Process & Calculation	3	1-0	4
PCCH4202	Chemical Process Technology	3	0-0	3	PCCH4204	Mechanical Operation	3	1-0	4
Theory Credits				19	Theory Credits				21
Practical/ Sessional					Practical/ Sessional				
HSSM7203	COMMUNICATION AND INTERPERSONAL SKILLS FOR CORPORATE READINESS	0	0-3	2	BECS7208	Database Management System Lab	0	0-3	2
BECS7207	C++ & Object Oriented Programming Lab	0	0-3	2	PCCH7205	Fuel Technology Lab.	0	0-3	2
PCCH7201	Fluid Flow Lab	0	0-3	2	PCCH7204	Mechanical Operation Lab	0	0-3	2
PCCH7202	Chemical Technology	0	0-3	2	Practical/ Sessional Credits				6
Practical/ Sessional Credits				8	Practical/ Sessional Credits				6
TOTAL SEMESTER CREDITS				27	TOTAL SEMESTER CREDITS				27

BSCM1205 **Mathematics - III**

Module-I

(18 hours)

Partial differential equation of first order, Linear partial differential equation, Non-linear partial differential equation, Homogenous and non-homogeneous partial differential equation with constant co-efficient, Cauchy type, Monge's method, Second order partial differential equation
The vibrating string, the wave equation and its solution, the heat equation and its solution, Two dimensional wave equation and its solution, Laplace equation in polar, cylindrical and spherical coordinates, potential.

Module-II

(12 hours)

Complex Analysis:

Analytic function, Cauchy-Riemann equations, Laplace equation, Conformal mapping,
Complex integration: Line integral in the complex plane, Cauchy's integral theorem, Cauchy's integral formula, Derivatives of analytic functions

Module –III

(10 hours)

Power Series, Taylor's series, Laurent's series, Singularities and zeros, Residue integration method, evaluation of real integrals.

Text books:

1. E. Kreyszig," Advanced Engineering Mathematics:, Eighth Edition, Wiley India Reading Chapters: 11,12(except 12.10),13,14,15
2. B.V. Ramana, " Higher Engineering Mathematics", McGraw Hill Education, 2008
Reading chapter: 18

Reference books:

1. E.B. Saff, A.D.Snyder, " Fundamental of Complex Analysis", Third Edition, Pearson Education, New Delhi
2. P. V. O'Neil, "Advanced Engineering Mathematics", CENGAGE Learning, New Delhi

BSCC1208 Chemistry - II

Module I

1. Water Technology: Hardness of Water : Types of hardness, Units of hardness and their interrelation, Determination of hardness(EDTA method only). Disadvantage of hard water . Water softening technology (internal and external (limesoda,zeolite,and ion exchange methods) Desalination(electrodialysis, reverse osmosis, Sterilization of water by bleaching power, chlorine, ozone, chloramine. Determination of B.O.D and C.O.D of water sample.

2. Corrosion: Theories of corrosion , Types of corrosion , Factors affecting corrosion, Corrosion Control: (Proper design and fabrication procedure, Cathodic protection, Passivation).

MODULE-II

1. Fuels: Classification of fuels, calorific value, (Determination by Dulong's formula),G.C.V&N.C.V

Liquid fuel: Classification of petroleum, Refining of petroleum , Cracking, Knocking and anti knocking,cetane and octane numbers . Unleaded petrol, synthetic petrol, power alcohol

Gaseous Fuel : Producer gas, Water gas, LPG , CNG, Kerosene gas

Combustion Calculation.

2. Battery technology

Introduction, Batteries and cells, Basic components of battery, its Classification characteristics,Chemical batteries(dry, Lead acid & gel batteries) Alkaline batteries(zinc-air,aluminium-air,Nickel metal hydride battery) Reserve batteries(magnesium-copper,Gordan-magnesium battery) Nickel cadmium battery

Module III

1. POLYMER . Polymer: Types, polymerization process and mechanisms

Conducting polymers(poly aniline, poly acetylene),polymer composite(carbon fiber)

Preparation. Properties and uses of following polymer(polyethylene,PMMA,PTFE

Bakelite,polyurethanes,polycarbonate)

2 Nano materials

Nano material; Carbon nano tube,(synthesis, properties and application.) Application of nano material in medicine, fuel cell, catalysis (only general idea)

Text Books:

1. Engineering chemistry by Putti R.vljayasrarhy ,PHI Ltd
2. Engineering chemistry by P.C jain and M. jain

Reference Books:

1. Engineering chemistry by N Krishnamurthy ,p vallinaygam,Dmadhavan, PHI Ltd
2. Engineering chemistry by mary,jane.shultz ,Cengage learning publication
3. Engineering chemistry by R.Gopalan,D.venkaapaya,and SNagarajan, Vikas publishing house.

BSMS 1209 **Material Sciences**

MODULE – I

1. Classification of Engineering Materials. Engineering properties of materials. Selection of Materials.
2. Electron theory of solids : Free electron theory of metals. Electrical conductivity; Thermal conductivity, Quantum theory of free electrons. Band theory of solids, Conductivity of metals
3. Conductors, Insulators, Semiconductors, Intrinsic and extrinsic semiconductors, Band theory of semi conductors Hall effect.
4. Super Conductors – Zero resistivity, Critical magnetic field and critical current density. Type I and II super conductors. Applications of Superconductors.

MODULE – II

5. Dielectric Materials : Microscopic Displacement of atoms and molecules in an external dc electric field, Polarization and dielectric constant, Dielectric _nitially_lity. Temperature dependence, Dielectric Breakdown. Ferro electric material Piezoelectrics, Pyroelectrics, Dielectric Materials as electrical isulators.
6. Magentic Properties of Materials : Dia, Para and Ferro magenetic materials. Theory of magnetism, Ferro magnetic materials or Ferrites, Comparison of magnetic behaviour and magnetic parameters of Dia, Para and Ferro magnetic materials.
7. Optical Properties of Materials : Scattering, Refraction, Theory of Refraction and absorption, Atomic Theory of optical properties. Lasers, Optical fibres – Principle, structure, application of optical fibre.

MODULE – III

8. Plastics – Types : Thermosetting and thermoplastics. Transfer moulding, injection moulding, extension moulding, Blow moulding, Welding of plastics; Rubber types, application.
9. Ceramics : Types, Structure, Mechanical properties, applications
10. Composite Materials : Agglomerated Materials : Cermets, Reinforced Materials : Reinforced Concrete. Glass fibre reinforced plastics, Carbon fiber reinforced plastics. Whiskers, fiber reinforced plastics, Laminated plastic sheets. Tufnol, Properties of composites. Metal matrix composites, manufacturing procedure for fibre reinforced composites.
11. Environmental Degradation: Oxidation-Direct atmospheric attack, Aqueous corrosion-Electro chemical attack, Glavanic two –metal corrosion, corrosion by Gaseous reduction, Effect of mechanical stress on corrosion, method of corrosion prevention

Text book:

1. Vijaya M. S., Rangarajan G, Materials Science, TMH
2. Introduction to Materials science for engineers by James.F.shackelford, Madanapalli.k.Muralidhara , Pearson (sixth edition)

Reference Book:

1. Rajendra V., Marikani A., Materials Science, TMH
2. Van Vlack L. H., Elements of Material Science and Engineering, Addison Wesley
3. Raghavan , Material Science
4. Callister W.D., Materials Science and Engineering, John Wiley & Sons.
5. Smith, Materials Science & Engineering. Mc. Graw Hill.
6. Processes and Material of manufacture : Lindberg, PHI.

BECS2212 C++ & Object Oriented Programming

Module I

(08 hrs)

Introduction to object oriented programming, user defined types, structures, unions, polymorphism, encapsulation. Getting started with C++ syntax, data-type, variables, strings, functions, default values in functions, recursion, namespaces, operators, flow control, arrays and pointers.

Module II

(16 hrs)

Abstraction mechanism: Classes, private, public, constructors, destructors, member data, member functions, inline function, friend functions, static members, and references.

Inheritance: Class hierarchy, derived classes, single inheritance, multiple, multilevel, hybrid inheritance, role of virtual base class, constructor and destructor execution, base initialization using derived class constructors.

Polymorphism: Binding, Static binding, Dynamic binding, Static polymorphism: Function Overloading, Ambiguity in function overloading, Dynamic polymorphism: Base class pointer, object slicing, late binding, method overriding with virtual functions, pure virtual functions, abstract classes.

Operator Overloading: This pointer, applications of this pointer, Operator function, member and non member operator function, operator overloading, I/O operators.

Exception handling: Try, throw, and catch, exceptions and derived classes, function exception declaration.

Module III

(08 hrs)

Dynamic memory management, new and delete operators, object copying, copy constructor, assignment operator, virtual destructor.

Template: template classes, template functions.

Namespaces: user defined namespaces, namespaces provided by library.

Text Books:

1. Object Oriented Programming with C++ - E. Balagurusamy, McGraw-Hill Education (India)
2. ANSI and Turbo C++ - Ashoke N. Kamthane, Pearson Education

Reference Books:

1. Big C++ - Wiley India
2. C++: The Complete Reference- Schildt, McGraw-Hill Education (India)
3. "C++ and Object Oriented Programming" – Jana, PHI Learning.
4. "Object Oriented Programming with C++ "- Rajiv Sahay, Oxford
5. Mastering C++ - Venugopal, McGraw-Hill Education (India)
6. "Object Oriented Programming with C++", David Parsons, Cengage Learning.

HSSM3204 **Engineering Economics & Costing**

Module-I: (12 hours)

Engineering Economics – Nature and scope, General concepts on micro & macro economics. The Theory of demand, Demand function, Law of demand and its exceptions, Elasticity of demand, Law of supply and elasticity of supply. Determination of equilibrium price under perfect competition (Simple numerical problems to be solved). Theory of production, Law of variable proportion, Law of returns to scale.

Module-II: (12 hours)

Time value of money – Simple and compound interest, Cash flow diagram, Principle of economic equivalence. Evaluation of engineering projects – Present worth method, Future worth method, Annual worth method, internal rate of return method, Cost-benefit analysis in public projects. Depreciation policy, Depreciation of capital assets, Causes of depreciation, Straight line method and declining balance method.

Module-III: (12 hours)

Cost concepts, Elements of costs, Preparation of cost sheet, Segregation of costs into fixed and variable costs. Break-even analysis-Linear approach. (Simple numerical problems to be solved)

Banking: Meaning and functions of commercial banks; functions of Reserve Bank of India. Overview of Indian Financial system.

Text Books:

1. Riggs, Bedworth and Randhwa, "Engineering Economics", McGraw Hill Education India.
2. M.D. Mithani, Principles of Economics.

Reference Books :

1. Sasmita Mishra, "Engineering Economics & Costing", PHI
2. Sullivan and Wicks, "Engineering Economy", Pearson
3. R.Paneer Seelvan, "Engineering Economics", PHI
4. Gupta, "Managerial Economics", TMH
5. Lal and Srivastav, "Cost Accounting", TMH

HSSM 3205 **Organizational Behaviour**

Module I :

The study of Organizational Behaviour : Defination and Meaning, Why Study OB

Learning – Nature of Learning, How Learning occurs, Learning and OB.

Foundations of Individual Behaviour : Personality – Meaning and Defination, Determinants of Personality, Personality Traits, Personality and OB.

Perception – Meaning and Definition, Perceptual Process, Importance of Perception in OB.

Motivation – Nature and Importance, Herzberg’s Two Factor Theory, Maslow’s Need Hierarchy Theory, Alderfer’s ERG Theory, Evaluations.

Module II :

Organizational Behaviour Process : Communication – Importance, Types, Gateways and Barriers to Communication, Communication as a tool for improving Interpersonal Effectiveness, Groups in Organizations – Nature, Types, Why do people join groups, Group Cohesiveness and Group Decision-making Managerial Implications, Effective Team Building. Leadership-Leadership & Management, Theories of Leadership-Trait theory, Leader Behaviour theory, Contingency Theory, Leadership and Followership, How to be an effective Leader, Conflict-Nature of Conflict and Conflict Resolution. An Introduction to Transactional Analysis (TA).

Module-III :

Organization : Organizational Culture – Meaning and Definition, Culture and Organizational Effectiveness. Introduction to Human Resource Management-Selection, Orientation, Training and Development, Performance Appraisal, Incentives Organizational Change – Importance of Change, Planned Change and OB techniques. International Organisational Behaviour – Trends in International Business, Cultural Differences and Similarities, Individual and Interpersonal Behaviour in Global Perspective.

Text Books :

1. Keith Davis, Organisational Behaviour, McGraw-Hill.
2. K.Aswathappa, Organisational Behaviour, Himalaya Publishing House.

Reference Books :

1. Stephen P. Robbins, Organisational Behaviour, Prentice Hall of India
2. Pradip N. Khandelwal, Organizational Behaviour, McGraw-Hill, New Delhi.
3. Uma Sekaran, “Organizational Behaviour”, TATA McGraw-Hill, New Delhi.
4. Steven L McShane, Mary Ann Von Glinow, Radha R Sharma” Organizational Behaviour” , TATA McGraw- Hill.
5. D.K. Bhattachayya, “Organizational Behaviour”, Oxford University Press
6. K.B.L.Srivastava & A.K.Samantaray, “Organizational Behaviour” India Tech

PCCH4201 **Fluid Flow and Flow Measurement**

Module I:

Units and dimensional analysis, Types of Fluids.

Fluid Static: Hydrostatic Pressure, Pressure measuring Devices.

Introduction to fluids in motion, Flow in boundary layers. Its formation & growth in tubes & plates. Basic equations of fluid flow continuity, momentum & Bernoullies equation. Flow measuring devices; Venturi, Orifice, Pitot tube & Rotameter.

Module II :

Flow of incompressible fluid in pipes, Relation between skin friction & wall shear. Laminar flow in pipes, Hagen-Poiuilles equation, Friction factor, Friction from changes in velocity or direction, Flow of compressible fluids, Basic equations. Flow past immersed bodies, Drag Co-efficient. Motion of particles through fluids. Its mechanics, terminal Velocity.

Module III:

Friction inflow through beds of solids, Fluidization, Mechanism of fluidization, pressure drop in fluidization, Application of fluidization.

Transportation of fluids, Reciprocating rotary & centrifugal pump, fans, blowers & compressors. Characteristics curves & calculation of power & efficiency of pumps. Concept of slip.

Text Books

1. Unit operations of Chemical Engg. by Mc Cabe & Smith.
2. Fluid Mechanics for Chemical Engg. by Noel Drevvers.
3. A Text book of Fluid Mechanics & Hydralic Machines by R.K.Bansal
4. Fluid Mechanics by A.K.Jain

PCCH4202 **Chemical Process Technology.**

Module I:

Heavy Chemicals: Caustic Soda & Chlorine, HCL, Soda Ash, Sulphuric acid

Module II:

Extraction Refining of Oil, hydrogenation of Oil.

Soap & Synthetic detergents .

Pulp & Paper Industry

Technology of Pigment & Dyes, Natural Dyes

Module III:

Manufacture of Sugar, Starch & its derivative Industrial & Absolute Alcohol.

Synthetic fibers.

Polyethylene, PVC, Phenol formaldehyde & Poly Vinyl Acetate.

Books:

1. Outlines of Chemical Technology – C.E.Dryden, Edited & revised by M. Gopal Rao & M. Siftig .
2. A Textbook of Chemical Technology- S.D.Shukla & G.N.Pandey.
3. Shreeve's Chemical Process Industries, George.

HSSM7203 **Communication & Interpersonal skills for Corporate Readiness Lab.**

30 hours

This course will focus on communication in professional (work-related) situations of the kind that BPUT graduates may expect to encounter on entering the professional domain.

Some typical forms of work-related communication, oral or written, are listed below. Practice activities for all four skills can be designed around these or similar situations.

1. Gaining entry into an organization
 - i. Preparing job-applications and CVs
 - ii. Facing an interview
 - iii. Participating in group discussion (as part of the recruitment process)
- 2 In-house communication
 - a. Superior/ Senior → subordinate / junior (individual → individual / group)
 - i. Welcoming new entrants to the organization, introducing the workplace culture etc.
 - ii. Briefing subordinates / juniors : explaining duties and responsibilities etc.
 - ii. Motivating subordinates / juniors ('pep talk')
 - iii. Instructing/ directing subordinates/ juniors
 - iv. Expressing / recording appreciation, praising / rewarding a subordinate or junior
 - v Reprimanding / correcting / disciplining a subordinate/junior (for a lapse) ; asking for an explanation etc.
 - b. Subordinate / Junior → Superior / Senior
 - i. Responding to the above
 - ii. Reporting problems / difficulties / deficiencies
 - iii. Offering suggestions

BECS7207 **C++ & Object Oriented Programming Lab**

1. Programs on concept of classes and objects.(1 class)
2. Programs using inheritance.(1 class)
3. Programs using static polymorphism.(1 class)
4. Programs on dynamic polymorphism.(1 class)
5. Programs on operator overloading.(1 class)
6. Programs on dynamic memory management using new, delete operators.(1 class)
7. Programs on copy constructor and usage of assignment operator.(1 class)
8. Programs on exception handling .(1 class)
9. Programs on generic programming using template function & template class.(1 class)
10. Programs on file handling.(1 class)

PCCH7201 **Fluid Flow Lab**

1. Fluidised bed – To determine minimum fluidisation velocity and pressure drop.
2. Flow through pipes - To find out the pressure drop.
3. Centrifugal Pump – To draw the characteristics curves and find out the efficiency.
4. Reciprocating Pump – To draw the characteristics curves and find out the efficiency.
5. Venturi Meter – To find out the flow rate of fluid flowing inside a pipe.
6. Orifice Meter – To find out the flow rate of fluid flowing inside a pipe.
7. Reynold's Apparatus – To verify the flow whether it is laminar or turbulent.
8. Bernoulli's Apparatus – To verify the Bernoulli's Equation.
9. Pitot tube – To find out the point velocity of Fluid.
10. V-Notch – To measure the flow rate of a fluid by using V – Notch.
11. Packed Bed – To find out the pressure drop when a fluid is flowing through a packed bed.

PCCH7202 **Chemical Technology Lab**

- (1) Manufacture of Soap from Vegetable Oil.
- (2) Determination Dissolve Oxygen of the given Water Sample.
- (3) Determination of PH value of the given slurry.
- (4) To determine Acid value of the given Oil Sample.
- (5) To determine concentration of Sugar solution by Refractometer.
- (6) Estimation of N₂ in Nitrogenous fertilizer.
- (7) Preparation of Jam & Jelly.
- (8) Preparation of Natural Dyes.

BSCM1210 **Mathematics – IV**

Module-I

(20 hours)

Numerical methods:

Approximation and round of errors, Truncation error and Taylor's series

Roots of equation: The bisection method, the false-position method, fixed point iteration, the Newton-Raphson method, Muller's method

Linear algebraic equation: LU decomposition, the matrix inverse, Gauss-Seidel method

Interpolation: Newton divided difference interpolation, Lagrange Interpolation, Newton's forward and backward interpolation.

Numerical integration: The trapezoidal rule, The Simpson's rules, Gauss quadrature

Ordinary differential equation: Euler's method, Improvement of Euler's method, Runge-Kutta methods

Module-II

(10 Hours)

Probability:

Probability, Random variables, Probability distributions, Mean and variance of distribution, Binomial, Poisson and Hypergeometric distributions, Normal distribution, Distribution of several random variables.

Module-III

(10 Hours)

Mathematical Statistics:

Random sampling, Estimation of Parameters, Confidence Intervals, Testing of hypothesis, Acceptance sampling, Chi square test for goodness of fit , Regression Analysis, Fitting Straight Lines, Correlation analysis.

Text books:

1. S. C. Chapra and R. P. Canale, "Numerical methods for Engineers", Fifth Edition, McGraw Hill Education
Reading Chapters : 2, 3(3.1, 3.2), 4(4.2, 4.3), 5(5.1, 5.2, 5.3), 6(6.4), 9(9.1, 9.2), 10(10.2), 13(13.1,13.2,13.5), 16(16.1, 16.2), 17(17.3), 20(20.1, 20.2, 20.3)
2. E. Kreyszig," Advanced Engineering Mathematics:, Eighth Edition, Wiley India
Reading Chapters: 22, 23(except 23.5 and 23.8)

Reference books:

1. Jay L. Devore, "Probability and Statistics for Engineering and Sciences", Seventh Edition, Thomson/CENGAGE Learning India Pvt. Ltd
2. P. V.O'Neil, "Advanced Engineering Mathematics", CENGAGE Learning, New Delhi

BECS2208 Database Management System

Module I : (10 hours)

Database System Architecture - Data Abstraction, Data Independence, Data Definitions and Data Manipulation Languages. Data models - Entity Relationship(ER), Mapping ER Model to Relational Model, Network .Relational and Object Oriented Data Models, Integrity Constraints and Data Manipulation Operations.

Module II : (12 hours)

Relation Query Languages, Relational Algebra and Relational Calculus, SQL.

Relational Database Design: Domain and Data dependency, Armstrong's Axioms, Normal Forms, Dependency Preservation, Lossless design.

Query Processing Strategy.

Module III: (10 hours)

Transaction processing: Recovery and Concurrency Control. Locking and Timestamp based Schedulers.

Database Recovery System: Types of Data Base failure & Types of Database Recovery, Recovery techniques

Text Books:

1. Database System Concepts by Sudarshan, Korth (McGraw-Hill Education)
2. Fundamentals of Database System By Elmasari & Navathe- Pearson Education

References Books:

- (1) An introduction to Database System – Bipin Desai, Galgotia Publications
- (2) Database System: concept, Design & Application by S.K.Singh (Pearson Education)
- (3) Database management system by leon &leon (Vikas publishing House).
- (4) Fundamentals of Database Management System – Gillenson, Wiley India
- (5) Database Modeling and Design: Logical Design by Toby J. Teorey, Sam S. Lightstone, and Tom Nadeau, “”, 4th Edition, 2005, Elsevier India Publications, New Delhi

PCCH4203 **Chemical Process Calculations**

Module-1

Units & dimensions, The chemical equation & stoichiometry, concept of limiting & excess reactants, conversion, degree of conversion, yield etc.

Ideal gas laws, equation of state, Vapor pressure, Clausius-Clapeyron equation, humidity-relative saturation & percentage saturation, concept of wet & dry bulbs thermometer, use of humidity Chart.

Module-2

Material balances & unit operation-drying, crystallization dissolution, combustion.

Solving material balance with Chemical reaction, recycle, bypass & purge Calculations.

Module-3

Energy balance concepts & units, Heat capacity, Calculation of enthalpy changes without change of phase, Energy balance with Chemical reaction, Standard heat of reaction at constant, pressure & constant volume, effect of temperature, on heat of reaction, Adiabatic reaction of temperature, heat of solution & mixing.

Text books

- (1) Chemical process principles-Hoejen, Watson, John Wiley & Asia pub.
- (2) Stoichiometry-Bhatt BI & SM Vora
- (3) Stoichiometry & process Calculations by-K.V. Narayanan & B-lakshmikatty

PCCH4204 **Mechanical Operation**

Objective: This course acquaints the students of the mechanical method of sizing, separating & transportation of particles.

Module-I: Particle size, shape, Specific surface area, etc.

Size Reduction: Laws of grinding, Jaw, roll and gyratory crushers, revolving mills, Ball mill, attrition mill, fluid energy mill, open Circuit & closed Circuit grinding.

Module-II : Size Separation, screening, screening equipments, Trommels, Capacity & effectiveness of screens, Magnetic and Electrostatic Separators.

Motion of particles through fluid, drag Coefficient, Free and hindered setting, Thickeners, Cyclones etc.

Module-III: Classifications: Sink & float method, Jigging, Tabling.

Fillration, Theory, plats & frame filter pron, Leaf fietr, Rotary filter,

Mixing & Agitation power consumption of Mixer Mixing equipment. Forth flotation, Conveying, Different Conveyers

Books Recommended:

- 1) Mc Cabe & Smith ,Unit operations of Chemical engineering, Mc Graw lim
- 2) Coulson & Richabol Vol-2 Chemical Engineering pergammic Press.
- 3) Brown etcl,Chint operation,Asian Publication.

BECS7208 **Database Managements System Lab**

1. Use of SQL syntax: insertion, deletion, join, updation using SQL. (1 class)
2. Programs on join statements and SQL queries including where clause. (1 class)
3. Programs on procedures and functions. (1 class)
4. Programs on database triggers. (1 class)
5. Programs on packages. (1 class)
6. Programs on data recovery using check point technique. (1 class)
7. Concurrency control problem using lock operations. (1 class)
8. Programs on ODBC using either VB or VC++. (1 class)
9. Programs on JDBC. (1 class)
10. Programs on embedded SQL using C / C++ as host language. (1 class)

PCCH7205 **Fuel Technology Lab**

1. Determination of Moisture Content, Volatile Matter, Carbon and Ash by Proximate Analysis method.
2. Determination of Cloud & Pour Point of an oil sample.
3. Determination of flash & fire Point on an oil sample.
4. Determination of Moisture content of an oil sample by Dean & Stark Apparatus.
5. Determination of Carbon Residue of an oil sample by Conradson's Apparatus.
6. Determination of Aniline Point of an oil sample.
7. Determination of Viscosity of an oil sample.
8. Determination of Calorific Value by Bomb Calorimeter.

PCCH 7204 **Mechanical Operation Lab**

1. To find out the average size of particles in a sample (Volume - surface mean diameter).
2. To determine the Grindability Index of coal by Hard Groove machine.
3. To determine the time of grinding in a ball mill for producing a product with 80% passing a given screen.
4. To separate a mixture of coal into two fractions using sink and float method.
5. To separate a mixture of coal into two fractions using flotation technique.
6. To determine the Optimum time of sieving for a given sample of material.
7. To verify the Rittinger's and Kick's law using crushing rolls and to find out the Work Index of the coal.
8. To find out the effectiveness of hand screening of a given screen.
9. To determine the batch sedimentation data and to calculate the minimum thickner area under given conditions.
10. To determine the specific cake resistance and filter medium resistance of a slurry in Plate - and - frame filter press.
11. To verify the laws of size reduction using a vibrating mill.
12. To find the effectiveness of a Trommel.
13. To find the size analysis of a given fine sample using Beaker decantation method.
14. To compare open circuit and closed circuit grinding by means of a ball mill.
15. To concentrate a given material by means of Trabling.
