

SVM Institute of Technology, Bharuch

Department of Chemical Engineering

Syllabus: Mid/Remid Exam (Even Sem March/April 2019)

BE – VIII (8th Sem)

Name of Faculty: Palak A. Trivedi

Subject Code: 2180508

Subject Name: Solid Fluid Operations

Sr. No.	Unit No	Topics
1	1	Introduction: Solid- Fluid operations, characterization and classification.
2	2	Mixing and agitation: Mixing, Agitation, Different types of agitators and their selection criteria, Calculation of power required for agitation, Scale up of agitated vessel, static mixers, intensive mixers, heating and cooling mixers
3	3	Fluidization: Fluid flow in porous solid beds, Conditions for Fluidization, Types of fluidization, Applications of fluidization.
4	4	Transportation: Mechanic, Slurry, hydraulic and pneumatic transport, conveyors.

Reference Book:

Unit Operations of Chemical Engg. By W.L. McCabe, J. C. Smith & Harriott, 6th Edition
Mc-Graw Hill international.

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Name of Faculty: Aesha J. Mehta

Subject Code: 2180503

Subject Name: Process Modelling Simulation and Optimisation

Sr. No.	Unit No	Topics
1	6	The Nature and Organization of Optimization Problems: Scope and hierarchy of optimization, examples of applications of optimization, the essential features of optimization problems, general procedure for solving optimization problems, obstacles to optimization.
2	7	Developing Models for Optimization: Classification of models, how to build a model, selecting functions to fit empirical data, factorial experimental designs, degrees of freedom, examples of inequality and equality constraints in models, formulation of the objective function.
3	8	Basic Concepts of Optimization: Continuity of function, NLP problem statement, convexity and its applications, interpretation of the objective function in terms of its quadratic approximation, necessary and sufficient conditions for an extremum of an unconstrained function.
4	9	Optimization of Unconstrained Functions: One-Dimensional search numerical methods for optimizing a function of one variable, scanning and bracketing procedures, Newton and Quasi-Newton methods of uni-dimensional search, polynomial approximation methods, how one-dimensional search is applied in a multidimensional problem, evaluation of uni-dimensional search methods.
5	10	Unconstrained Multivariable Optimization: Methods using function values only, methods that use first derivatives, Newton's method, Quasi-Newton methods.

Reference Book:

Edger, Himmelblau, Lasdon, Optimization of Chemical Processes, McGraw-Hill International Edition.

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BE – VIII (8th Sem)

Name of Faculty: Dr. Pritam Patil and Prof. Aesha Mehta

Subject Code: 2180507

Subject Name: Transport Phenomena

Sr. No.	Unit No	Topics
1	1	Introduction to Transport Phenomenon: Classification of Transport Processes, Conservation Laws, Vector and Tensor Calculus
2	2	Principles of Momentum Transport: Concept of Viscosity, Newton's Law of Viscosity, Shell Momentum Balance, Application of Shell Momentum Balance, Flow of Falling Film, Flow Through Circular Pipe, Flow Through Annulus.
3	3	Principles of Steady State Heat Transport: Steady State Condition and Fourier's Law, Shell Energy Balance, Applications of Shell Energy Balance: Heat Conduction with Electrical Source, Heat Conduction with Chemical Heat Source, Temperature Distribution in Two Concentric Cylinder's.

Reference Book:

1. R. Byron Bird, "Transport Phenomena", 2nd Edition, John Wiley & Sons (Asia) pvt. Ltd.
2. Christie John Geankoplis, "Transport Processes and Separation Process Principles", 4th Edition, PHI Learning Private Limited., New Delhi
3. Incropera, "Fundamentals of Heat and Mass Transfer", 6th Edition, John Wiley & Sons (Asia) pvt. Ltd.
4. W.J.Thomson, "Introduction to Transport Phenomena", Pearson Education Asia, New Delhi, 2001.

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BE – VIII (8th Sem)

Name of Faculty: S.I.CHATURVEDI

Subject Code: 2180502

Subject Name: PETROLEUM REFINING AND PETROCHEMICALS

Sr. No.	Unit No	Topics
1	1	BASIC OF PETROLEUM : Role of crude oil in global economy, Present Scenario of crude oil Refinery, Importance, Occurrence, Origin (Formation) , exploration, composition, Classification and Evaluation of crude oil, Crude assay analysis, Distillation characteristics such as TBP,ASTM &EFV etc.
2	2	PROPERTIES OF CRUDE AND PETROLEUM PRODUCTS : Various types of average boiling points of crude oil & petroleum fractions. : Types of gases and their composition, Types of Gasoline and it's important properties & tests such as ASTM Distillation, RVP, Octane number, Oxidation stability, sulfur content etc. : Various types of Naphtha and their important properties & applications. : Important test & properties of Kerosene such as Flash & Fire point, Smoke point, Aniline point etc. : Types of Diesel & it's important properties & test such as Pour point, Diesel Index, Cetane number etc. : Heavy fractions like Lube oil, Bitumen, Asphalt etc. & their important properties such as Viscosity Index, Carbon Residue, Penetration Index, Softening point etc.
3	3	Processing of Petroleum : Pretreatment of Crude (dehydration and Desalting), Pumping of waxy crude, Heating of crude, Distillation of petroleum & Types of Reflux, ADU & VDU, Topping operation etc.
4	4	Treatment Techniques : Physical Impurities found in crude & their removal, Sweetening Techniques, Production & treatment of LPG & their methods, Dehydration & sweetening of gases, Gasoline treatment such as Lead Doctoring, Merox sweetening, catalytic Desulphurization etc .Treatment of Kerosene, Various method of Treatment of Lubes oil such as clay treatment, Phenol extraction ,Furfural extraction, Dewaxing etc.

Reference Book:

- 1 : B.K. Bhaskar Rao, Modern Petroleum Refining Process.
- 2 : M. Gopal Rao. Dryden's outlines of chemical technology.
- 3.: George Austin, Shreve's chemical process industries
- 4: W.L. Nelson, Petroleum Refining engineering