VEER SURENDRA SAI UNIVRSITY OF TECNOLOGY, BURLA

Lesson plan

Semester: 6th

Subject: Transport Phenomena

Lecture	Module	Topic
1	1	Momentum transport: Viscosity and mechanism, Newton's law and viscosity, Non-Newtonian fluids
2	1	Temperature and pressure dependence of viscosity (gases at low density)
3	1	Velocity distributions in laminar flow
4	1	Shell momentum balances
5	1	Flow of falling film
6	1	Flow through circular tube
7	1	Flow through circular annulus
8	1	adjacent flow of two immiscible fluids
9	1	creeping flow around a solid sphere
10	2	Equations of changes for isothermal system (compressible)
11	2	Unsteady state viscous flow
12	2	Interphase transportations in isothermal system, Friction factor
13	2	Energy transport : Thermal conductivity in solids, Fourier s law of heat conduction
14	2	Temperature and heat dependence of thermal conductivity in gases and liquids
15	2	Temperature distributions in solids and in laminar flow, Shell energy balances
16	2	Heat conduction with chemical sources
17	2	Heat conduction with electrical sources
18	2	Heat conduction with viscous sources,
19	2	Heat conduction through composite walls
20	2	Heat conduction in cooling fin
21	2	Free convection
22	2	Forced convection
23	3	Equations of change for non-isothermal systems
24	3	Equations for energy in rectangular coordinates
25	3	Examples on momentum and energy transports
26	3	Unsteady state heat conduction in solids
27	3	Mass transport: Diffusivity and mechanism, Temperature and pressure dependence of mass diffusivity
28	3	Concentration distributions in solids and in laminar flow, Shell mass balances
29	3	diffusion through a stagnate gas film
30	3	Diffusion with homogeneous chemical reactions
31	3	Diffusion with heterogeneous chemical reactions
32	3	diffusion into a falling liquid film
33	3	Diffusion and chemical reaction inside a porous catalyst.
34	4	Equations of continuity for a binary mixture in rectangular coordinates
35	4	Inter-phase transport in multi-component system
36	4	Definition of binary mass transfer coefficients in one phase
37	4	Correlations of binary mass transfer coefficients in one phase at low mass transfer coefficients
38	4	Correlations of binary mass transfer coefficients in two phase at low mass transfer rates
39	4	Correlations of binary mass transfer coefficients in two phase at high mass transfer rates
40	4	Examples on Mass transport

Signature of the Faculty Member: Counter Signature of H.O.D

Date:

VEER SURENDRA SAI UNIVRSITY OF TECNOLOGY, BURLA

Lesson plan

Semester: 6th

Subject: Reaction Kinetics and Catalysis

Lecture	Module	Topic
1	1	Introduction, Significance and Application of the subject in real world
2	1	Classifications of reactions
3	1	Reaction rate
4	1	Variables affecting the rate of reaction
5	1	Order and molecularity of reaction
6	1	determination, theoretical study of reaction rates
7	1	Problems on reaction rates
8	1	The Arrhenius relationship
9	1	Collision theory and activated complex theory
10	1	Class Test-I
11	2	Different types of reactors
12	2	Integral methods of analysis
13	2	Differential methods of analysis
14	2	Design of batch reactors for single ideal reactions,
15	2	Design of semi-batch reactors for single ideal reactions,
16	2	Problems on batch and semi batch reactors
17	2	Design of continuous stirred tank reactors for single ideal reactions,
18	2	Design of plug flow reactors for single ideal reactions,
19	2	Problems on CSTR and PFR
20	3	Reactions in series under isothermal operations
21	3	Reactions in parallel under isothermal operations
22	3	Mixed reactions under isothermal operations
23	3	Problems on single and parallel reactions
24	3	Design of adiabatic reactors
25	3	Design of non-isothermal reactors
26	3	Introduction to enzyme kinetics
27	3	Problems on enzyme kinetics
28	3	Heterogeneous reactions: examples
29	3	Classification of catalysts
30	3	General procedure for manufacture of catalysts
31	3	Catalytic promoters and poisons
32	3	Reactions catalyzed by solid catalysts
33	3	Problems on heterogeneous reactions
34	3	Class Test-II
35	4	Engineering properties of catalysts and their determination
36	4	General mechanism of catalytic reactions
37	4	Adsorption isotherms
38	4	Transport processes in reactions catalyzed by solids
39	4	Design of heterogeneous catalytic reactors
40	4	Problems on catalytic reactors

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