DR.K.N.MODI FOUNDATION
DR. K. N. Modi Institute of Engineering & Technology
Department of Chemical Engineering

Lecture Plan

PROGRAM (B.Tech/M.Tech/ MBA/MCA)	SEM	SUBJECT NAME	SUBJECT CODE	PERIODS (As per University)			EVALUATION SCHEME				SUBJECT TOTAL	CREDIT
							SESSIONAL			ESE		
				L	T	P	CT	TA	TOTAL			
B.Tech.	III	CEFM	KCH 302	3	1	0	30	20	50	100	150	4

Periods (Actual)			Name of Faculty	Name of Subject Coordinator	Date of Commencement	Total lectures planned	Date of Conclusion
L	T	P					
6	1	0	ARTI DEVI	ARTI DEVI	4 Sept	52	6 Dec 23

Course /Subject Objective: To present the fundamental insights of fluids and their static and dynamic behaviors and fluid machineries

Lecture Schedule	Topics/Contents	References Chapter No.	Date (Actual)
Lecture-1	**UNIT-I** Fundamental concepts of fluids;		11 SEPT 2023
Lecture-2	Fluid statics, kinematics and dynamics;		12SEPT 2023
Lecture-3	Properties of fluids.		13,14SEPT 2023
Lecture-4,5	basic equation of fluid statics;		15 SEPT 2023
Lecture-6	Pressure –depth relationship;		16SEPT 2023
Lecture-7	Pressure forces on plane and curved surfaces;		18SEPT 2023
Lecture-8	Buoyancy and stability; Forces on immersed and submergedbodies;		19,20 SEPT 2023
Lecture-9	Pressure measurements;		21 SEPT 2023
Lecture-10	Pressure in accelerated rigid body motions.		22,23SEPT 2023
Lecture-11	**UNIT-II** Lagrangian and Eulerian descriptions;		25,26SEPT 2023
Lecture-12,13	Flow visualization – streamline, pathline,		27 SEPT 2023
Lecture-14	streakline and timeline, profile plots;		28 SEPT 2023
Lecture-15	Description and classification of fluid motions;		29,30SEPT 2023
Lecture-16	Rotational, irrotational,		2 OCT 2023

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Lecture-17	Inviscid and potential flows;		3 OCT 2023
Lecture-18	Deformation of fluids;		4 OCT 2023
Lecture-19	System and control volume representation;		5 OCT 2023
Lecture-20,21	Reynolds transport theorem.		6 OCT 2023
Lecture-22	Conservation of mass,		7 OCT 2023
Lecture-23	linear and angular momentum, and energy;		9 OCT 2023
Lecture-24	Eulers equation of motion,		10 OCT 2023
Lecture-25	Bernoulli theorem; Navier-Stokes equations.		11,12 OCT 2023
Lecture-26	**UNIT-III** Dimensional homogeneity and analysis;		13 OCT 2023
Lecture-27	Methods of finding dimensionless numbers;		14 OCT 2023
Lecture-28	Selection of variables, Rayleigh and Buckingham's π method;		16 1OCT 2023
Lecture-29	Common dimensionless numbers and their physical significance		17OCT 2023
Lecture-30	; Model and Prototypes;		18,19 OCT 2023
Lecture-31	Complete and incomplete similarity.		20,21 OCT 2023
Lecture-32	UNIT-IV General characteristics of pipe flow – laminar, turbulent,		23,24OCT 2023
Lecture-33	entrance region, fully developed;		27,28 OCT 2023
Lecture-34,35	Fully developed laminar/turbulent flow in pipe – shear stress distribution and velocity profiles;		30 ,31 OCT 2023
Lecture-36	Energy correction factors;		1,2 NOV 2023
Lecture-37	Energy and hydraulic grade lines;		3,4 NOV 2023
Lecture-38	Major and minor losses in pipes,		5,6 NOV 2023
Lecture-39	fittings, pipe network;		7 NOV 2023
Lecture-40	Friction factor.		8,NOV 2023
Lecture-41	Flow rate and velocity measurements –		9,10 NOV 2023
Lecture-42	Pitot tube notches and weirs.		11 NOV 2023
Lecture-43	, orifice meter, venturimeter, rotameter		12,13 NOV 2023
Lecture-44,45	**UNIT-V** Classification; Positivedisplacement pumps and compressors,		14,15,16 NOV 2023
Lecture-46	centrifugal pumps and compressors,		18,19 NOV 2023
Lecture-47	Axial flow pumps and compressors,		20,21 NOV 2023
Lecture-48	Compressor efficiency. Characteristics of centrifugal pumps;		27, 28 NOV 2023
Lecture-49	NPSH; Selection of pumps		29 NOV 2023
Lecture-50	Agitated vessels; Blending and mixing;		4 ,DEC2023
Lecture-51	Suspension of solid particles; Dispersion operations;		5DEC2023
Lecture-52	Agitator selection and scale up.		6 DEC2023

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Course /Subject Outcome:

1. Understand the properties and flow of fluid.
2. Analyse the model and prototype.
3. Explain the factors influencing velocity profiles for laminar and turbulent flow.
4. Design the pumps and compressors for optimum operation.

References

1. Raj1put, R. K., "Textbook of Fluid Mechanics", S. Chand and Co. New Delhi
2. Cengel Y.A. and Cimbala J.M. "Fluid Mechanics: Fundamentals and Applications", 2 Ed. McGraw-Hill

Signature of Faculty

Signature of Subject Coordinator

Signature of HOD

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SYLLABUS

PROGRAM (B.Tech/M.Tech / MBA/MCA)	SEM	SUBJECT NAME	SUBJECT CODE	PERIODS (As per University)			EVALUATION SCHEME				SUBJECT TOTAL	CREDIT
				L	T	P	SESSIONAL			ESE		
							CT	TA	TOTAL			
B.Tech	VI	WT	KCS602	3	1		30	20	50	100	150	4

Periods (Actual)			Name of Faculty	Date of Commencement	Total lectures planned	Date of Conclusion
L	T	P				
3	2		Mrs.Neha	26/02/2024	44	30/05/2024

UNIT-I

Introduction:

Introduction and Web Development Strategies, History of Web and Internet, Protocols Governing Web, Writing Web Projects, Connecting to Internet, Introduction to Internet services and tools, Introduction to client-server computing. Core Java: Introduction, Operator, Data type, Variable, Arrays, Methods & Classes, Inheritance, Package and Interface, Exception Handling, Multithread programming, I/O, Java Applet, String handling, Event handling, Introduction to AWT, AWT controls, Layout managers.

UNIT-II

Web Page Designing: HTML: List, Table, Images, Frames, forms, CSS, Document type definition, XML: DTD, XML schemes, Object Models, presenting and using XML, Using XML Processors: DOM and SAX, Dynamic HTML

UNIT-III

Scripting: Java script: Introduction, documents, forms, statements, functions, objects; introduction to AJAX, Networking : Internet Addressing, InetAddress, Factory Methods, Instance Methods, TCP/IP Client Sockets, URL, URL Connection, TCP/IP Server Sockets, Datagram.

UNIT-IV

Enterprise Java Bean: Preparing a Class to be a JavaBeans, Creating a JavaBeans, JavaBeans Properties, Types of beans, Stateful Session bean, Stateless Session bean, Entity bean Java Database Connectivity (JDBC): Merging Data from Multiple Tables: Joining, Manipulating, Databases with JDBC, Prepared Statements, Transaction Processing, Stored Procedures.

UNIT-V

Servlets: Servlet Overview and Architecture, Interface Servlet and the Servlet Life Cycle, Handling HTTP get Requests, Handling HTTP post Requests, Redirecting Requests to Other Resources, Session Tracking, Cookies, Session Tracking with Http Session Java Server Pages (JSP): Introduction, Java Server Pages Overview, A First Java Server Page Example,

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Implicit Objects, Scripting, Standard Actions, Directives, Custom Tag Libraries..

Lecture Plan

Lecture Schedule	Topics/Contents	Date (Planned)	Date (Actual)
Lecture 1	**Introduction and Web Development Strategies** • Overview of web development • Strategies for web development	26/2/24	26/2/24
Lecture 2	**History of Web and Internet** • Evolution of the web • Key milestones in the history of the internet	27/2/24	27/2/24
Lecture 3	**Protocols Governing Web and Writing Web Projects** • HTTP, HTTPS, FTP, TCP/IP • Basics of writing web projects	28/2/24	28/2/24
Lecture 4	**Connecting to the Internet** • ISPs, broadband, wireless connections • Setting up internet connections	29/2/24	29/2/24
Lecture 5	**Introduction to Internet Services and Tools** • Email, FTP, Telnet, WWW • Tools for internet use	1/3/24	1/3/24
Lecture 6	**Introduction to Java** • Java overview, JVM, JRE, and JDK • Installation and setup	4/3/24	4/3/24
Lecture 7	**Operators, Data Types, Variables** • Basic operators, primitive data types, variable declaration	5/3/24	5/3/24
Lecture 8	**Arrays and Methods** • Single-dimensional and multi-dimensional arrays • Method creation and usage	6/3/24	6/3/24
Lecture 9	**Classes, Inheritance, and Interfaces** • Class creation, inheritance, polymorphism • Interfaces in Java	7/3/24	7/3/24
Lecture 10	**Exception Handling and Multithreading** • Try-catch blocks, custom exceptions	8/3/24	8/3/24

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	• Creating and managing threads		
Lecture 11	**HTML Basics - Lists and Tables** • Ordered, unordered, and definition lists • Table creation and formatting	11/3/24	11/3/24
Lecture 12	**HTML - Images, Frames, and Forms** • Adding images and frames • Creating forms with different input types	12/3/24	13/3/24
Lecture 13	**Introduction to CSS** • CSS syntax, selectors, and properties • Applying styles to HTML elements	13/3/24	14/3/24
Lecture 14	**Advanced CSS and DTD** • Advanced styling techniques • Document Type Definition (DTD) in HTML	15/3/24	15/3/24
Lecture 15	**XML Basics - DTD and XML Schemas** • Introduction to XML, DTD • Creating and using XML Schemas	18/3/24	22/3/24
Lecture 16	**XML Object Models and Presentation** • Understanding object models • Presenting XML data	22/3/24	27/3/24
Lecture 17	**Using XML Processors - DOM and SAX** • Introduction to DOM and SAX • Parsing XML using DOM and SAX	28/3/24	28/3/24
Lecture 18	**Dynamic HTML** • Introduction to DHTML • Dynamic content and interactivity	29/3/24	29/3/24
Lecture 19	**Introduction to JavaScript** • JavaScript basics, syntax, and structure	1/4/24	1/4/24
Lecture 20	**JavaScript - Documents and Forms** • Accessing and manipulating DOM • Working with forms in JavaScript	2/4/24	2/4/24
Lecture 21	**JavaScript - Statements and Functions** • Control statements, loops • Function creation and usage	3/4/24	3/4/24
Lecture 22	**JavaScript Objects and AJAX** • Object-oriented JavaScript • Introduction to AJAX	4/4/24	4/4/24
Lecture 23	**Internet Addressing and InetAddress** • Understanding IP addresses and InetAddress	5/4/24	5/4/24

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	class		
Lecture 24	**Factory Methods and Instance Methods** • Factory methods, instance methods in networking	8/4/24	8/4/24
Lecture 25	**TCP/IP Client Sockets and URL Connection** • Creating and managing TCP/IP client sockets • Using URL and URLConnection classes	9/4/24	9/4/24
Lecture 26	**TCP/IP Server Sockets and Datagram** • Creating and managing TCP/IP server sockets • Using Datagram for UDP connections	10/4/24	12/4/24
Lecture 27	**Introduction to JavaBeans and Properties** • Creating JavaBeans • JavaBeans properties and types	12/4/24	15/4/24
Lecture 28	**Stateful and Stateless Session Beans** • Understanding stateful and stateless session beans	16/4/24	16/4/24
Lecture 29	**Entity Beans** • Introduction to entity beans • Creating and managing entity beans	18/4/24	19/4/24
Lecture 30	**Introduction to JDBC and Basic Queries** • JDBC overview, establishing connections • Executing basic SQL queries	22/4/24	22/4/24
Lecture 31	**Merging Data, Joins, and Prepared Statements** • Joining tables in SQL • Using PreparedStatement in JDBC	23/4/24	23/4/24
Lecture 32	**Transaction Processing and Stored Procedures** • Managing transactions in JDBC • Using stored procedures	25/4/24	25/4/24
Lecture 33	**Servlet Overview and Architecture** • Introduction to servlets • Servlet architecture	26/4/24	26/4/24
Lecture 34	**Servlet Life Cycle and HTTP Requests** • Servlet life cycle • Handling HTTP GET requests	29/4/24	29/4/24
Lecture 35	**Handling HTTP POST Requests and Redirection** • Handling HTTP POST requests • Redirecting requests to other resources	30/4/24	30/4/24
Lecture 36	**Session Tracking and Cookies**	1/5/24	1/5/24

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	• Session tracking mechanisms • Using cookies in servlets		
Lecture 37	**Introduction to JSP** • Overview of JSP • Setting up JSP environment	2/5/24	2/5/24
Lecture 38	**JSP Example and Implicit Objects** • Creating a simple JSP example • Understanding implicit objects in JSP	3/5/24	3/5/24
Lecture 39	**JSP Scripting and Standard Actions** • Using scripting elements in JSP • JSP standard actions and directives	6/5/24	7/5/24
Lecture 40	**Custom Tag Libraries** • Introduction to custom tag libraries • Creating and using custom tags in JSP	7/5/24	8/5/24
	Review of Key Concepts from Units I and II	9/5/24	9/5/24
	Review of Key Concepts from Units III and IV	20/5/24	20/5/24
	Review of Key Concepts from Unit V	24/5/24	24/5/24
	Final Review and Q&A Session	30/5/24	30/5/24

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				L	T	P	SESSIONAL			ESE		
							CT	TA	TOTAL			
B.Tech	VI	CN	KCS603	3	1		30	20	50	100	150	4

Periods (Actual)			Name of Faculty	Date of Commencement	Total lectures planned	Date of Conclusion
L	T	P				
3	2		Mrs.Pravesh	26/02/2024	44	30/5/2024

UNIT-I

Introduction:

Goals and Applications of Networks, Network structure and architecture, The OSI reference model, services, Network Topology Design - Delay Analysis, Back Bone Design, Local Access Network Design, Physical Layer Transmission Media, Switching methods, ISDN, Terminal Handling.

UNIT-II

Medium Access sub layer: Medium Access sub layer - Channel Allocations, LAN 8 protocols - ALOHA protocols - Overview of IEEE standards - FDDI. Data Link Layer - Elementary Data Link Protocols, Sliding Window protocols, Error Handling.

UNIT-III

Network Layer: Network Layer - Point - to Pont Networks, routing, Congestion control 8 Internetworking -TCP / IP, IP packet, IP address, IPv6.

UNIT-IV

Transport Layer: Transport Layer - Design issues, connection management, session 8 Layer-Design issues, remote procedure call. Presentation Layer-Design issues, Data compression techniques, cryptography - TCP - Window Management.

UNIT-V

Application Layer: Application Layer: File Transfer, Access and Management, Electronic 8 mail, Virtual Terminals, Other application. Example Networks - Internet and Public Networks.

Lecture Plan

Lecture Schedule	Topics/Contents	Date (Planned)	Date (Actual)
Lecture 1	• Goals and Applications of Networks	26/2/24	26/2/24

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Lecture 2	• Network structure and architecture	27/2/24	27/2/24
Lecture 3	• The OSI reference model	28/2/24	28/2/24
Lecture 4	• services, Network Topology Design	29/2/24	29/2/24
Lecture 5	• Delay Analysis	1/3/24	1/3/24
Lecture 6	• Back Bone Design	4/3/24	4/3/24
Lecture 7	• Local Access Network Design	5/3/24	5/3/24
Lecture 8	• Physical Layer Transmission Media	6/3/24	6/3/24
Lecture 9	Switching methods	7/3/24	7/3/24
Lecture 10	• ISDN	8/3/24	8/3/24
Lecture 11	• Terminal Handling	11/3/24	11/3/24
Lecture 12	• Medium Access sub layer	12/3/24	13/3/24
Lecture 13	• Medium Access sub layer	13/3/24	14/3/24
Lecture 14	• Channel Allocations	15/3/24	15/3/24
Lecture 15	• LAN 8 protocols	18/3/24	22/3/24
Lecture 16	• ALOHA protocols	22/3/24	27/3/24
Lecture 17	• Overview of IEEE standards	28/3/24	28/3/24
Lecture 18	• FDDI	29/3/24	29/3/24
Lecture 19	• Data Link Layer	1/4/24	1/4/24
Lecture 20	• Elementary Data Link Protocols	2/4/24	2/4/24
Lecture 21	• , Sliding Window protocols	3/4/24	3/4/24
Lecture 22	• Error Handling	4/4/24	4/4/24
Lecture 23	• Network Layer	5/4/24	5/4/24
Lecture 24	• - Point - to Pont Networks	8/4/24	8/4/24
Lecture 25	• routing	9/4/24	9/4/24

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Lecture 26	• Congestion control	10/4/24	12/4/24
Lecture 27	• Internetworking -TCP / IP	12/4/24	15/4/24
Lecture 28	• IP packe	16/4/24	16/4/24
Lecture 29	• IP address	18/4/24	19/4/24
Lecture 30	• IPv6	22/4/24	22/4/24
Lecture 31	• Transport Layer	23/4/24	23/4/24
Lecture 32	• Design issues	25/4/24	25/4/24
Lecture 33	• connection management	26/4/24	26/4/24
Lecture 34	• session Layer	29/4/24	29/4/24
Lecture 35	• Design issues	30/4/24	30/4/24
Lecture 36	• remote procedure call	1/5/24	1/5/24
Lecture 37	• Presentation Layer-Design issues	2/5/24	2/5/24
Lecture 38	• Data compression techniques	3/5/24	3/5/24
Lecture 39	• cryptography - TCP	6/5/24	7/5/24
Lecture 40	• - Window Management.	7/5/24	8/5/24
Lecture 41	Application Layer: File Transfer, Access and Management	9/5/24	9/5/24
Lecture 42	Electronic 8 mail, Virtual Terminals	20/5/24	20/5/24
Lecture 43	Example Networks - Internet and Public Networks	24/5/24	24/5/24
Lecture 44	Final Review and Q&A Session	30/5/24	30/5/24

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				L	T	P	SESSIONAL			ESE		
							CT	TA	TOTAL			
B.Tech.	IV	CET	KCH 403	3	1	0	30	20	50	100	150	4

Periods (Actual)			Name of Faculty	Name of Subject Coordinator	Date of Commencement	Total lectures planned	Date of Conclusion
L	T	P					
6	1	0	ARTI DEVI	ARTI DEVI	18 Mar 24	45	29 May 24

Pre-requisite: Basic MATHEMATICS

Course /Subject Objective:

- To impart knowledge about the different type of equations in chemical engineering problems.
- To teach the solution strategy of differential algebraic, ordinary differential equation, and partial differential equations

Test 1:
Test 2:
Makeup Test/PUT:

Lecture Schedule	Topics/Contents	References	Date
		Chapter No.	(Actual)
Lecture-1	UNIT I Thermodynamic Laws and:		20 Mar 24
Lecture-2	Property Relations		23 Mar 24
Lecture-3	Laws of thermodynamics and their applications		23 Mar 24 Mar
Lecture-4	PVT behaviour of pure Substances		25 Mar
	PVT behaviour of mixtures; Generalized equations		26, 27 Mar
Lecture-5	Joule's experiment; Carnot cycle and Carnot theorems;		28 Mar
Lecture-6	Thermodynamic property relations; Maxwell relations;		29 Mar
Lecture-7	Partial derivatives		30 Mar

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Lecture-8	Jacobian method; Residual properties; Partial molar properties,		31 Mar.
Lecture-9	Excess properties of mixtures;		1 Mar
Lecture-10,11	, Thermodynamic property tables and diagrams,		3 Apr.
Lecture-13	**UNIT II**		4 Apr.
Lecture-,13	Criteria for equilibrium between phases in multi component non-reacting systems in terms of chemical potential and fugacity		5, 6, 7 Apr.
Lecture-14	Application of phase rule;		8 Apr.
Lecture-15	Vapour-liquid equilibrium; Phase diagrams for homogeneous systems and for systems with a miscibility gap		10, 11 Apr
Lecture-16	; Effect of temperature and pressure on azeotrope composition;		12, 13 Apr.
Lecture-17	Liquid-liquid equilibrium;		14 Apr.
Lecture-18	Ternary liquid liquid equilibrium.,		15 Apr.
Lecture-19	**UNIT III** Correlation and Prediction of Phase Equilibria: Activity coefficient;		16, 17 Apr
Lecture-20,21	Composition models; thermodynamic consistency of phase equilibria		18, 19 Apr
Lecture-22, 23	Application of the correlation and prediction of phase equilibria in systems of engineering		20, 21 Apr
Lecture-24	interest particularly to distillation		22 Apr.
Lecture-25	liquid extraction processes.		29 Apr
	UNIT IV,		
Lecture-26	Definition of standard state; .		26, 29 Apr
Lecture-27	standard free energy change and reaction equilibrium constant		1 May 2 May
Lecture-28	; evaluation of reaction equilibrium constant;		8 May
Lecture-29	prediction of free energy data;		5, May
Lecture-30	equilibria in chemical reactors,		6 May

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Lecture-31	calculation of equilibrium compositions for homogeneous chemical reactors		8 May
Lecture-32	calculation of equilibrium compositions for homogeneous chemical reactors		9, 10 May
Lecture-33	thermodynamic analysis of simultaneous reactions		11 May
Lecture-34,35	Inverse Interpolation,		12 May
Lecture-36			
	UNIT V		
Lecture 37, -38	Principles of refrigeration;		13 May
Lecture-39	methods of producing refrigeration		15 May
Lecture-40	Liquefaction process;		16 May
Lecture-41	coefficient of performance		17 May
Lecture-42,43	evaluation of the performance of vapour compression		18, 19 May
			20, 21 May
Lecture-44,45	gas refrigeration cycles..		22, 23 May

Course /Subject Outcome: Inspection of the final product without destroying

References:

1. Smith, J.M., VanNess, H.C., & Abbot M.C, Introduction to Chemical Engineering Thermodynamics, 7th Edition, Tata
2. Narayanan K.V, Text Book of Chemical Engineering Thermodynamics, Phi Learning Pvt. Ltd-New Delhi

Signature of Faculty

Signature of Subject Coordinator

Signature of HOD

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							SESSIONAL			ESE		
				L	T	P	CT	TA	TOTAL			
B.Tech.	IV	MECHANICAL OPERATION	KCH 401	3	0	0	30	20	50	100	150	3

Periods (Actual)			Name of Faculty	Name of Subject Coordinator	Date of Commencement	Total lectures planned	Date of Conclusion
L	T	P					
6	1	0	ARTI DEVI	ARTI DEVI	18 Mar 24	52	10 Jun 24

Course /Subject Objective:

- To impart Knowledge on particle size analysis, size reduction, separation of solid particles from fluids and flow through porous media.

Lecture Schedule	Date (Planned)	Topics/Contents	References Chapter No.	Date (Actual)
Lecture-1		Introduction Particles Size Analysis	1	20 Mar 24
Lecture-2		General characteristics of solids;		21 Mar 24
Lecture-3		Different techniques of size analysis; Shape factor;		22 Mar 24 23 Mar 24
Lecture-4,5		Surface area determination; Estimation of particle size;		24 Mar 24
Lecture-6		Screening methods and equipment;		25 Mar
Lecture-7		Screen efficiency;		27 Mar
Lecture-8		Ideal and actual screens.		29, 30 Mar
Lecture-9		Bisection, Secant, Method of False Position or Regula Falsi etc.		31 Mar. 1, Apr.
Lecture-10		Size Reduction		3 Apr.
Lecture-11		Methods of size reduction		4 Apr 24

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Lecture-12,13		; Classification of equipments; Crushers; Grinders; Disintegrators for coarse,	5, 6 Apr.	5, 6 Apr
Lecture-14		Intermediate and fine grinding; Laws of size reduction;	7. Apr.	7. Apr.
Lecture-15		Energy relationships in size reduction; power requirement; Work index	8, 10 Apr.	8, 10 Apr
Lecture-16		Energy relationships in size reduction; power requirement;	11, 12 Apr.	11, 12 Apr.
Lecture-17		Work index	12 Apr.	12 Apr.
Lecture-18		Energy relationships in size reduction; power requirement; Work index	13, 14 Apr.	13, 14 Apr.
Lecture-19		Particle Separation: Gravity settling;	15 Apr.	15 Apr
Lecture-20,21		Sedimentation;	17. Apr.	17 Apr
Lecture-22		Thickening; Elutriation; Double cone classifier; Rake classifier; Bowl classifier; Centrifugal separation;	18, 19, 20 Apr.	18, 19, 20 21 Apr
Lecture-23		Continuous centrifuges; Design of basket centrifuges; Industrial dust removing equipment; Cyclones;		22 Apr. 24 Apr.
Lecture-24		Electrostatic - Heavy media separations; Floatation; Jigging		26 Apr 29 Apr.
Lecture-25		Electrostatic - Magnetic separators; Heavy media separations; Floatation; Jigging		1 May 2 May
Lecture-26		Hydro cyclones;		3 May
Lecture-27		Fitting a Hyperbola, a Trigonometric Function, etc.,		5, 6, May
Lecture-28		Electrostatic - Magnetic separators; Heavy media separations; Floatation; Jigging		8, 9, 10 May
Lecture-29		Hydro cyclones;		10 May
Lecture-30		Magnetic separators;		11 May
Lecture-31		Central Differences, Newton's Forward, Backward		12 May
Lecture-32		Divided Differences Interpolation Formula,		13 May
Lecture-33		Interpolation Polynomials, Lagrange Interpolation Formula		15 May

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Lecture-34,35		, Inverse Interpolation,		16 May
Lecture-36		Algorithms & Computer Programming for all these Methods in Applications of Chemical Engineering		17 May 23
Lecture-37		**UNIT IV** Numerical Differentiation & Integration:		18 May
Lecture-38		Differentiation Formula based on Tabulator at Equal and Unequal Intervals,		19, 20 May
Lecture-39		Newton-Cotes Integration Formulas,		22 May
Lecture-40		Trapezoidal Rule		23 May
Lecture-41		Simpson's $1/3_{rd}$, and $3/8_{th}$ Rule,		24 May
Lecture-42		Algorithms & Computer Programming for all these Methods in Applications of Chemical Engineering.		25 May, 26 M
Lecture-43		**UNIT V** Ordinary Differential Equations:		27 May
Lecture-44,45		Taylor's Series and Euler's Method,		29 May
Lecture-46		Modifications and Improvements in Euler's Method,		29 May
Lecture-47		Runge-Kutta 2_{nd} Order & 4_{th} Order Methods,		30 May
Lecture-48		Milne's Predictor-Corrector Methods,		1 Jun
Lecture-49		Boundary Value Problems,		2 Jun
Lecture-50		Algorithms & Computer Programming for all these Methods		3, 5 Jun
Lecture-51		Applications of Chemical Engineering. Partial Differential Equations: Parabolic, Hyperbolic, Elliptic		6, 7 Jun
Lecture-52		Explicit method-finite difference), Applications in Chemical Engineering		9, 10 Jun

Course /Subject Outcome: 1. Measure the particle size,
2. Estimate the crushing efficiency of different type's crushers.
3. Explain the particle sedimentation.
4. Design the storage area for the different types of solids.

References:

1. Brown G.G., Unit Operations, CBS Publishers & Distributors.
2. McCabe W.L., Smith J.C and Harriott P., "Unit Operations ofChemical Engineering", 7thEd.McGraw Hill.

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DR.K.N.MODI FOUNDATION
DR. K. N. Modi Institute of Engineering & Technology
Department of Chemical Engineering

Lecture Plan

PROGRAM (B.Tech/M.Tech/ MBA/MCA)	SEM	SUBJECT NAME	SUBJECT CODE	PERIODS (As per University)			EVALUATION SCHEME				SUBJECT TOTAL	CREDIT
							SESSIONAL			ESE		
				L	T	P	CT	TA	TOTAL			
B.Tech.	VI	MASS TRANSFER II	KCH 601	3	1	0	30	20	50	100	150	4

Periods (Actual)			Name of Faculty	Name of Subject Coordinator	Date of Commencement	Total lectures planned	Date of Conclusion
L	T	P					
6	1	0	ARTI DEVI	ARTI DEVI	19 Aug .23	54	2 Nov. 23

Course /Subject Objective:

- To impart knowledge on fundamentals of mass transfer phenomena and to apply those concepts to real engineering problems.
- To explain the principles of mass transfer and their application to separation and purification processes.
- To describe the principles and operations of mass transfer equipment.

Lecture Schedule		Topics/Contents	References Chapter No.	Date (Actual)
Lecture-1		Introduction Distillation		7,8,9 AUG 2023
Lecture-2		Introduction Distillation		10,11 12AUG 2023
Lecture-3		Introduction Distillation		16 ,17 AUG 2023
Lecture-4,5		Pressure-composition, Temperature-concentration, Enthalpy-concentration diagrams for ideal and non-ideal solutions, Raoults law and its application;		18 ,19 12AUG 2023
Lecture-6		Pressure-composition, Temperature-concentration, Enthalpy-concentration diagrams for ideal and non-ideal solutions, Raoults law and its application;		22,23,24 AUG 2023
Lecture-7		Z		26, 29AUG 2023
Lecture-8		**Pressure-composition, Temperature-concentration, Enthalpy-concentration diagrams for ideal and non-ideal**		

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		solutions, Raoults law and its application;		
Lecture-9		**Maximum and minimum boiling mixtures, concept of relative volatility,**		11,12,13 SEPT 2023
Lecture-10		Single Stage Distillation, Differential distillation, Flash vaporization, Vacuum, molecular and steam distillation		14,15 16,SEPT 2023
Lecture-11		Single Stage Distillation, Differential distillation, Flash vaporization,		17,SEPT 2023
Lecture-12,13		Vacuum, molecular and steam distillation		19,20 SEPT 2023
Lecture-14		Continuous Distillation of Binary Mixtures:		21 SEPT 2023
Lecture-15		Multistage contact operations, Characteristics of multistage tower, McCabe Thiele method, Ponchon Savarit method,.		22,23SEPT 2023
Lecture-16		Reflux, maximum, min. and optimum reflux, Use of open steam, Tray efficiency, Determination of height and column diameter,		25,26SEPT 2023
Lecture-17		Reflux, maximum, min. and optimum reflux, Use of open steam, Tray efficiency, Determination of height and column diameter,		27 SEPT 2023
Lecture-18		Reflux, maximum, min. and optimum reflux, Use of open steam, Tray efficiency, Determination of height and column diameter,		28 SEPT 2023
Lecture-19		Reflux, maximum, min. and optimum reflux, Use of open steam, Tray efficiency, Determination of height and column diameter,		29,30SEPT 2023
Lecture-20,21		Multistage batch distillation; Principles of azeotropic and extractive distillation, Introduction to multi component distillation system		2 OCT 2023
Lecture-22		Multistage batch distillation; Principles of azeotropic and extractive distillation, Introduction to multi component distillation system		3 OCT 2023
Lecture-23		Liquid-Liquid Extraction:		9 OCT 2023
Lecture-24		Ternary liquid equilibrium, Triangular graphical representation concept of theoretical or ideal stage,.		4 OCT 2023
Lecture-25		Equipment used for single stage and multistage continuous operation; Analytical and graphical solution of single and multistage operation Super critical fluid extraction		5 OCT 2023
Lecture-26		Equipment used for single stage and multistage continuous operation		6 OCT 2023
Lecture-27		; Analytical and graphical solution of single and multistage operation Super critical fluid extraction.,		7 OCT 2023
Lecture-28		; Analytical and graphical solution of single and multistage operation Super critical fluid extraction		9 OCT 2023
Lecture-29		; Analytical and graphical solution of single and multistage operation Super critical fluid extraction		10 OCT 2023
Lecture-30		Magnetic separators;		11,12 OCT 2023
Lecture-31		Central Differences, Newton's Forward, Backward		13 OCT 2023
Lecture-32		Divided Differences Interpolation Formula,		14 OCT 2023
Lecture-33		Interpolation Polynomials, Lagrange Interpolation Formula.		16 1OCT 2023

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Lecture-34,35	, Inverse Interpolation,		
Lecture-36	Algorithms & Computer Programming for all these Methods in Applications of Chemical Engineering		16 OCT 2023 17OCT 2023
Lecture-37	**UNIT IV** Numerical Differentiation & Integration:		18,19 OCT 2023
Lecture-38	Differentiation Formula based on Tabulator at Equal and Unequal Intervals,		20,21 OCT 2023
Lecture-39	Newton-Cotes Integration Formulas,		23,24OCT 2023
Lecture-40	Trapezoidal Rule		27,28 OCT 2023
Lecture-41	Simpson's $1/3_{rd}$, and $3/8_{th}$ Rule,		9,10 NOV 2023
Lecture-42	Algorithms & Computer Programming for all these Methods in Applications of Chemical Engineering.		11 NOV 2023
Lecture-43	**UNIT V** Ordinary Differential Equations:		30 ,31 OCT 2023
Lecture-44,45	Taylor's Series and Euler's Method,		1,2 NOV 2023
Lecture-46	Modifications and Improvements in Euler's Method,		3,4 NOV 2023
Lecture-47	Runge-Kutta 2_{nd} Order & 4_{th} Order Methods,		5,6 NOV 2023
Lecture-48	Milne's Predictor-Corrector Methods,		7 NOV 2023
Lecture-49	Boundary Value Problems,		8,NOV 2023
Lecture-50	Algorithms & Computer Programming for all these Methods		9,10 NOV 2023
Lecture-51	Applications of Chemical Engineering. Partial Differential Equations: Parabolic, Hyperbolic, Elliptic		11 NOV 2023
Lecture-52	Explicit method-finite difference), Applications in Chemical Engineering		30 ,31 OCT 2023 1,2 NOV 2023

Course /Subject Outcome:

Students completing the course will be able to

Understand the basics of distillation process for separation.

Analyze the distillation process for binary and multicomponent mixtures

Determine the number of stages required for separation of liquid-liquid and solid-liquid extraction process.

Understand the adsorption mechanism and adsorption equilibrium

References:

1.Robert. E. Treybal. —Mass Transfer Operationl, 3e, Mc Graw Hill, NY,

2 Mc Cabe and J.M.Smith. —Unit Operations in Chemical Engineeringl , 7e, McGraw Hill

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Department of Applied Science and Humanities

LECTURE PLAN

Environment & Ecology
Course /Subject Objective: B.Tech BAS: 104

Lect. No.	Contents to be covered	Proposed Date	Actual Date
	UNIT -1		
1	Introduction	7/4/24	8/4
2	Definition, Types of Environment	8/4/24	9/4
3	Components of environment	10/4/24	11/4
4	Segments of environment, Scope and importance	11/4/24	15/4
5	Need for Public Awareness.	15/4/24	16/4
6	***Ecosystem:*** Definition, Types of ecosystem	16/4/24	22/4/24
7	Structure of ecosystem, Food Chain	22/4/24	23/4
8	Food Web, Ecological pyramid. Balance Ecosystem	23/4/24	24/4
9	**Green Chemistry:** IntroductionEffects of Human Activities such as Food, Shelter, Housing	24/4/24	30/4/24
10	Economic and Social security on Environment,,	30/4/24	30/4/24
11	Environmental Impact Assessment,,	1/5/24	1/5/24
12	Sustainable Development	2/5/24	6/5/24
	Unit test – 1		
	Unit-II		
13	**Natural Resources:** Introduction, Classification	6/5/24	8/5
14	Water Borne and Water Induced Diseases,	8/5/24	11/5/24
15	Fluoride and Arsenic Problems in Drinking Water	11/5/24	11/5/24

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16	***Mineral Resources;*** Material Cycles	24/5/24	27/5
17	Carbon, Nitrogen	27/5/24	27/5
18	Sulfur cycles.	29/5	29/5
19	[illegible]. ***Energy Resources;*** Conventional and Non conventional Sources of Energy.	29/5/24	30/5
20	***Forest Resources;*** Availability, Depletion of Forests	30/5/24	3/6
	Unit Test 2		
	Unit-III:-		
21	**Pollution and their Effects; Public Health Aspects of Environmental;.**	3/6/24	6/6/24
22	Water Pollution	3/6/24	6/6/24
23	Air Pollution,	6/6/24	8/6
24	Soil Pollution	8/6/24	10/6
25	Noise Pollution.	10/6	10/6
26	Solid waste management	11/6	11/6
	Unit Test 3		
	Unit-IV		
27	**Current Environmental Issues of Importance;**		
28	Global Warming, Green House Effects,	12/6/24	12/6/24
29	Climate Change, Acid Rain	13/6/24	13/6/24
30	Ozone Layer Formation and Depletion	13/6/24	15/6
31	Population Growth and Automobile pollution	15/6/24	15/6
32	Burning of paddy straw.	17/6/24	17/6/24
	Unit-V		
33	**Environmental Protection**	18/6/24	18/6/24
34	Environmental Protection Act 1986,	18/6/24	25/6/24
35	Initiatives by Non Governmental Organizations (NGO's),	25/6/24	26/6
36	**Human Population and the Environment:**	26/6/24	3/7/24
37	Population growth,	3/7/24	4/7/24

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38	Environmental Education	4/7/24	6/7/24
39	Women Education.	6/7/24	6/7/24
40	Unit Test -5		

Reference Books:

1. Textbook of Environment and Ecology by Dave, Katewa & Singh, 2nd Edition, Cengage Learning India Pvt Ltd Delhi.
2. Environmental Studies by S Deswal, Dhanpat Rai & Co.
3. Environmental Studies by VK Ahluwalia, 2nd Edition,TERI Press, New Delhi.
4. Environmental Studies by R Rajgopalan, Oxford University Press.
5. Environment & Ecology by Singh & Malviya, Acme Learning

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LECTURE PLAN

Engg. Chemistry
Course /Subject Objective: B.Tech. BAS: 102

Lect. No.	Contents to be covered	Proposed Date	Actual Date
	UNIT -1 Atomic and Molecular Structure		
1	Introduction	4/4/24	4/4/24
2	Molecular orbital theory	4/4/24	8/4/24
3	Applications in diatomic molecules.	8/4/24	9/4/24
4	Determination of Bond order.	9/4/24	11/4
5	Band theory of solids crystal.	11/4/24	12/4
6	Liquid crystal Application of liquid crystals	12/4/24	15/4
7	Structure and applications of Graphite,Fullerenes	15/4/24	16/4
8	Concepts of Nano-materials, applications of Nano-materials	16/4/24	18/4
9	**Green Chemistry:** Introduction	18/4/24	22/4
10	12 principles and importance of green Synthesis,	22/4/24	23/4/24
11	Green Chemicals,	23/4/24	24/4/24
12	Synthesis of typical organic compounds by conventional and Green route (Adipic acid and Paracetamol),	24/4/24	25/4
13	Environmental impact of Green chemistry on society.	25/4/24	30/4
14	Assignment		
	Unit test – 1		
15	**Unit-II** Spectroscopic techniques and Applications	30/4/24	30/4/24
16	Introduction, Elementary idea spectroscopy	1/5/24	1/5/24

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17	Ultraviolet& Visible Spectroscopy	3/5/24	6/5/24
18	Bathochromic shift, Chromophore and Auxochrome concept	6/5/24	8/5
19	Application of UV-Visible spectroscopy, ,Bathochromic shift	8/5/24	4/5/24
20	**IR spectroscopy. Application**	27/5/24	24/5/24
21	NMR spectroscopy. Application	24/5/24	27/5
22	**Stereochemistry:** Optical isomerism in compounds without chiral carbon	23/5/24	23/5
23	Geometrical isomerism,	30/5/24	30/5
24	Chiral Drugs.	30/5/24	31/5/24
	Unit Test 2		
	Unit-III:- **Electrochemistry**		
25	Basic concepts of electrochemistry.	5/6/24	5/6/24
26	***Batteries;*** Classification and applications of Primary Cell and Secondary Cells	6/6/24	6/6/24
27	Lead acid battery.	7/6/24	7/6/24
28	Corrosion, Introduction to corrosion, Types of corrosion	7/6/24	10/6/24
29	Causes, effects and its prevention.	10/6/24	10/6/24
30	***Cement*** Constituents, manufacturing, hardening and setting,	11/6/24	11/6/24
31	deterioration of cement,	12/6/24	12/6
32	Plaster of Paris (POP)	13/6/24	13/6/24
	Unit Test 3		
	Unit-IV:- **Water treatment**		
33	Hardness of water.	13/6/24	17/6/24
34	Disadvantage of hard water	14/6/24	17/6/24
35	Calgon, Zeolite,	17/6/24	17/6
36	Lime-Soda, Ion exchange resin	18/6/24	18/6/24
37	Reverse osmosis, **Fuels and Combustion:** Definition, Classification,	18/6/24	24/6
38	**Fuels and its types**	24/6/24	25/6/24
39	classification of fuels	24/6/24	26/6
40	Analysis of coal,	24/6/24	28/6/24
41	Determination of calorific value (Bomb calorimeter and Dulong's methods)	30/6/24	30/6/24

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42	Chemistry of Biogas production from organic waste materials and their environmental impact on society	2/7/24	2/7/24
	Unit-V: **Material Chemistry** (Polymer)		
43	**Polymer introduction**	2/7/24	2/7/24
44	Basic concepts of polymer-Blend	3/7/24	3/7/24
45	Polymer composites	3/7/24	3/7/24
46	Conducting Polymer	4/7/24	4/7/24
47	Biodegradable polymers	5/7/24	5/7/24
48	Preparation and application of some industrially important polymers	5/7/24	5/7/24
49	Buna-S, Buna-N, Neoprene, Nylon-6, nylon-6,6 and Terylene	5/7/24	5/7/24
50	, Nylon-6, nylon-6,6 and Terylene	5/7/24	5/7/24
51	General methods of synthesis of organo metallic compounds.	8/7/24	8/7/24
52	Grignard reagent and their applications	9/7/24	9/7/24
	Unit test 5		

References:

1.Engineering Chemistry by Rath & Singh, 2nd Edition, Cengage Learning India Pvt Ltd Delhi
2. Engineering Chemistry by SS Dara, S Chand & Co Ltd
3. Physical chemistry by Atkins
4. Engineering Chemistry by Shashi Chawala, Dhanpat Rai Publishing Comp, New Delhi
5. University Chemistry by BH Mahan
6. Engineering Chemistry by OG Palanna, Mc Graw Hill Education, New Delhi

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