





(RAJ.)

**ECHNIQUES**

**ER (MECHANICAL)**

E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC



GOVERNMENT POLYTECHNIC COLLEGE, KOTA (RAJ.)

**SYLLABUS BREAK-UP (SESSION 2015-16)**

SUBJECT CODE : **CE202**

SUBJECT NAME : **FLUID MECHANICS**

FACULTY NAME : **ARCHANA SHARMA**

DESIGNATION : **LECTURER (MECHANICAL)**

S. NO.	TOPIC	LECTURE CLASSES REQUIRED TO COVER TOPIC	MONTHS IN WHICH THE TOPIC WILL BE COVERED	ACTUAL DATE OF COVERING OF THE TOPIC	REASON FOR NOT COVERING THE TOPIC IN DUE TIME	E-CONTENTS PROVIDED TO STUDENTS RELATED TO TOPIC
1	Introduction: Introduction concepts Fluids and solids Liquid, gas and vapour Fluid mechanics Kinematics Dynamics	1	AUG			
2	Fluid properties : Density, Specific volume, Specific gravity, Viscosity, Newton's law of viscosity, Dynamic and Kinematic viscosity	1	AUG			
3	Compressibility Surface tension - soap bubble, drop Capillarity Vapour pressure and its importance	1	AUG			
4	Fluid Pressure and its Measurement: Definition and its units Pascal's law Intensity of pressure at a point in fluid at rest Pressure head	1	SEP			
5	Pressure Atmospheric pressure Gauge pressure Vacuum pressure Absolute pressure Differentials pressure	1	SEP			
6	Law of hydrostatic pressure Brahma's press	1	SEP			

7	Pressure measurement Manometers Piezometer - its limitation U-tube - simple, differential, inverted Micro-manometers Inclined tube micro-manometers Mechanical gauge Bourdon gauge Bellow gauge Diaphragm gauge Dead weight gauge	2	SEP			
8	Hydrostatics: Total pressure Centre of pressure Total pressure and center of pressure in following cases Plane surface immersed horizontally Plane surface immersed vertically	2	SEP			
9	Plane surface immersed at an angle Curved surface (no proof) Working of lock gates, sluice gate, Pressure on masonry dams of rectangular and trapezoidal sections and their condition of stability	3	OCT			
10	Hydrokinematics : Description of fluid flow Eular approach Lagrangian approach Definition of path line, stream line Types of flow Steady - Non steady Uniform - Non uniform Laminar - Turbulent One, Two, Three dimensional flow	2	OCT			
11	Continuity equation (no proof) Rate of discharge one dimensional flow	2	OCT			

12	Hydrodynamics and Measurement of Flow: Energy of fluid - pressure, kinetic and potential Bernoulli's theorem (no proof) limitation Conversion of pressure into pressure head, velocity into kinetic head	2	NOV			
13	Applications of Bernoulli's theorem  Pitot-tube Venturimeter Orificemeter	2	NOV			
14	Orifices and Notches: Definition and classification Discharge through small orifices Coefficient of contraction Coefficient of velocity Coefficient of discharge Coefficient of resistance Time of emptying a vessel of uniform cross section through an orifice at bottom.	2	NOV			
15	Notches - Classification Crest, Nappe Difference between notch and weir Flow over - Triangular notch Rectangular notch [Simple numerical problems without velocity of approach]	4	NOV- DEC			
16	Flow Through Pipes: Laws of fluid friction. Losses of head in pipes Hydraulic gradient line.Total energy line. Flow through pipes in series.	3	DEC			

17	<p>Equivalent length Flow through parallel pipes (No branched pipes) Flow through siphon Definition of water hammer and its effect (No mathematical calculations)</p>	2	JAN			
18	<p>Flow through Channels: Uniform and Non uniform flow, difference in pipe and channel flow. Classification of an open channel Formula for uniform flow in open channels Chezy's formula Kutter's formula Bazin's formula Manning's formula</p>	2	JAN			
19	<p>Factors affecting roughness co-efficient Values of roughness co-efficient for different channel conditions Most economical section of channel - Rectangular section Triangular section Trapezoidal section Circular section</p>	3	JAN			
20	<p>Specific energy of flow in a channel at a cross section Explanation of the terms - Critical depth Critical flow Sub-critical flow Super-critical flow Hydraulic jump Measurement of flow in open channel by - Surface slope measurement Velocity measurement Flow measurement</p>	3	FEB			



21	Turbines : Introduction Classification of turbines Working principles of impulse and reaction turbine	2	FEB			
22	Constructional detail and working of different types of turbines (No mathematical analysis.) Pelton wheel turbine Francis turbine Kaplan turbine	3	FEB			
23	Pumps : Classification of pumps Constructional detail of reciprocating pump Constructional detail of centrifugal pump	3	MAR			
24	Comparison of reciprocating and centrifugal pump Brief description of submersible pump and deep well turbine pump Installation and maintenance of pumps	2	MAR			
	REVISION	10	MAR-APR			
	TOTAL	60				

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**SYLLABUS BREAK-UP (SESSION 2015-16)**

SUBJECT CODE : **CE202**

SUBJECT NAME : **FLUID MECHANICS**

FACULTY NAME : **ARCHANA SHARMA**

DESIGNATION : **LECTURE**

S.NO.	TOPIC	PRACTICAL CLASSES REQUIRED TO COVER TOPIC	MONTHS IN WHICH THE TOPIC WILL BE COVERED	ACTUAL DATE OF COVERING OF THE TOPIC	REASON FOR NOT COVERING THE TOPIC IN DUE TIME
1	Determination of coefficient of friction in pipe	2	AUG		
2	Determination of losses of head in flow through pipes	4	SEP		
3	Determination of roughness coefficient for different types of channel surfaces.	3	SEP - OCT		
4	Determination of surface velocity and mean velocity in an open channel	3	OCT		
5	Study of constructional features of working of Pelton wheel turbine and Francis turbine.	2	NOV		
6	Study of constructional features and working of centrifugal and reciprocating pump	2	NOV		
7	Study of different types of manometers and pressure gauges	2	DEC		
8	Verification of Bernoulli's theorem	2	JAN		
9	Determination of Cd for Venturimeter	2	JAN		
10	Determination of Cd for Orificemeter	2	FEB		
11	Determination of Cc,Cv and Cd of small orifice	3	FEB - MAR		
12	Visit of a nearby dam	3	MAR-APR		



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# GOVERNMENT POLYTECHNIC COLLEGE, KOTA

## SYLLABUS BREAK-UP (SESSION 2015-16)

SUBJECT CODE : **ME306**

SUBJECT NAME : **ADVANCE WORK**

FACULTY NAME : **ARCHANA SHARMA**

DESIGNATION :

S.NO	TOPIC	LECTURE CLASSES REQUIRED TO COVER TOPIC	MONTHS IN WHICH THE TOPIC WILL BE COVERED	ACTUAL DATE OF COVERING OF THE TOPIC	REASON COVERING IN DUE
1	Metal Cutting Saws - Specifications, description, working and uses of sawing machine : Description, specification of cutters/ blade for sawing machines, blade setting.	3	AUG		
2	Boring : Principle of boring, Classification of boring machines and their description, Specification of boring machine	3	SEP		
3	Boring tools Boring bars and boring heads Description of Jig boring machine	2	SEP		
4	Milling Machine : Specifications and working principle of milling machine Classification of milling machines and their brief description and their applications.	2	SEP		
5	Details of column and knee type milling machine	1	SEP		
6	Milling machine accessories and attachment -Arbors, adaptors, collets, vices, circular table, indexing head and tail stock, vertical milling attachment, spiral milling attachment, slotting attachment and rack milling attachment.	2	OCT		
7	Work holding devices: Milling methods-up milling and down milling	1	OCT		
8	Various types of milling cutters and mandrels for milling machines Milling operations-face milling, angular milling, form milling, straddle milling and gang milling	2	OCT		
9	Cutting speed and feed. Simple numerical problems	2	OCT		

10	Indexing on dividing heads, plain and universal dividing heads Indexing methods : direct, plain or simple, compound, differential and angular indexing. Numerical problems on indexing	3	NOV		
11	Helical and spiral milling Introduction to machining centre	1	NOV		
12	Grinding and Grinding Machines :  Purpose of grinding Various elements of grinding wheel – Abrasive, Grade, Structure, Bond Common wheel shapes and types of wheels - built up wheels, mounted wheels and diamond wheels. Specifications of grinding wheels as per BIS	3	NOV		
13	Truing and dressing, balancing and mounting of wheel Grinding methods: surface grinding, cylindrical grinding and centreless grinding	2	DEC		
14	Grinding Machines- cylindrical grinders, surface grinders, internal grinders, centreless grinders and tools and cutter grinders. Selection of grinding wheel	2	DEC		
15	Capstan and Turret Lathes : Concept of ram or capstan type and turret or saddle type machine Principal parts of capstan and turret lathes	2	JAN		
16	Capstan and Turret lathe mechanism : Turret indexing mechanism, Bar feeding mechanism Work holding devices : Jaw and collet chucks	2	JAN		
17	Tool holding devices : slide tool holder, knee tool holder, knurling tool holder, recessing tool holder, form tool holder, Tap and Die holder, V-steady box tool holder, roller steady box tool holder	2	JAN		
18	Introduction to turret tooling layout Difference among capstan, turret and conventional lathe	1	JAN		

19	Automatic Machines : Brief description of single spindle and multi-spindle automatic machines viz. Swiss type automatic screw machine and Turret type screw machines	2	FEB		
20	Transfer Machines- Inline , Rotary Indexing Table , Drum Machines	2	FEB		
21	Metal Finishing Processes : Purpose of finishing surfaces	1	FEB		
22	Description of lapping, super finishing, polishing and buffing processes	2	FEB		
23	Description of honing machine and honing tools	2	MAR		
24	Maintenance of Machine Tools : Importance of maintenance Different type of maintenance	2	MAR		
25	Sequence of maintenance operation : Disassembly, washing, fault finding, assembly	1	MAR		
26	Installation and Testing of Machine Tools :  Different types of machine foundation Foundation plan Machine tool testing	2	MAR		
	REVISION	10	MAR-APR		
	TOTAL	60			







