



## **C.U.SHAH UNIVERSITY – Wadhwan City**

**FACULTY OF:** -Technology and Engineering (Diploma Engineering)

**DEPARTMENT OF:** -Mechanical Engineering

**SEMESTER:** - I

**CODE:** - 2TE01FSM1

**NAME OF SUBJECT:** – Fundamentals of Structure and Mechanical Engineering.

### **Teaching & Evaluation Scheme:-**

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme								
		Th	Tu	Pr	Total		Theory				Practical (Marks)				Total Marks
							Sessional Exam		University Exam		Internal		University		
							Marks	Hours	Marks	Hours	Pr	TW	Pr		
2TE01FSM1	Fundamentals of Structure and Mechanical Engineering	4	0	2	6	5	30	1.5	70	03	30	20	-----	150	

### **Objective: -**

- To get basic knowledge of IC engine, Generator, Casting etc ...
- To get basic knowledge of Civil engineering.
- To get basic knowledge of foundation and different types of material use in construction work.

**Prerequisites: -** Basic knowledge of science principles.

### **Course Outlines:-**

Sr. No.	Course Contents	Number of Hours
	<b>SECTION –I (CIVIL ENGINEERING)</b>	
1	<b>Introduction on Structure Engineering:</b> Scope of Structural engineering, Need of structural engineering in today's era.	3
2	<b>Foundation Of Machine:</b> Purpose of Foundation, Failure of Foundation, Design of Foundation, Types of Loads acting on Foundations	4
3	<b>Civil Engineering Drawing:</b> Maps and Plans, Method of Projections(First and Third angle of projection), Abbreviations used in Building Drawing, Symbols for Materials, Doors, Windows and Furniture, Details shown in Building Drawing	5
4	<b>Surveying And Levelling:</b> Principles of Surveying, Instruments required for surveying, Ranging of Survey lines, Compass Survey, Purpose of Levelling, Dumpy level, Tilting level and Why level?, Temporary adjustments of levels, Use of Prismatic compass, Procedure of Levelling	10
5	<b>Different Civil Engineering Material:</b> Types of Construction Materials, Selection of Materials, Comparison between different materials, Water Cement ratio, Mixing and Handling of Concrete.	6

	<b>SECTION – II (MECHANICAL ENGINEERING)</b>	
<b>6</b>	<b>Metal Joining Processes And Foundry:</b> Welding Process with their need, types, applications and working principles, Brazing and soldering process, Foundry Fundamental, casting process their applications.	<b>6</b>
<b>7</b>	<b>Internal Combustion Engines:</b> Classification, Working principle of petrol, diesel and gas engine, Main parts of I.C.engine and its functions, Difference between Two stroke and Four stroke engine.	4
<b>8</b>	<b>Steam Generators And Prime Movers:</b> Function and classifications, working principle of boilers, Accessories of boiler, Mountings of boilers, Uses of boiler, Classification of Prime movers, Types of energy sources used by prime movers, Working principle of turbine, Steam turbine	6
<b>9</b>	<b>Hydraulics And Pneumatics Devices:</b> Types of fluids used in hydraulic systems, Properties of fluid, Definition and types of pump, Working principle of centrifugal pump, Advantage and limitations of hydraulic systems, Introduction and use of pneumatics systems, Difference between Hydraulics and pneumatics devices, Principle of different parts of pneumatic system, advantage and limitations of pneumatic system	6
<b>10</b>	<b>Power Transmission Devices:</b> Basic need of it, Types of power transmission devices, Coupling- introduction and application, Gears- introduction and application, Belt drive- introduction and application	6

#### **List of Experiments:-**

- Practice and demonstrate about different ranging and surveying instruments.
- To Study about levelling.
- To Study about machine foundations.
- To Study about different construction materials.
- Demonstration of metal joining processes (arc welding, gas welding, brazing, soldering). And study about Precautions and safety during metal joining processes.
- Demonstration of I.C. Engines and working of its main parts.
- Study about steam generator (Cochran boiler) and its accessories and mountings.
- Study about steam turbine, water turbine, and gas turbine.
- Demonstrate various power transmission devices (gears, belt drives, rope drives, chain drives, and couplings).

#### **Learning Outcomes:-**

- Know about different types instruments are using in Civil Engineering like Dumpy level, Engineering Compass, Metric Chain, Ranging Rod etc...
- Know about I C Engine and working of turbine.
- Know about Welding, brazing, Soldering and metal joining process.
- Know about steam generator and power transmission devices.

#### **Books Recommended:**

- R.K.Jain “*Production Technology*” ,Khanna Publication.
- S.K.Hajra Chaudari,A.K.Hajra Chaudhri, “*Work shop Technology Vol-I,II*” , Media Promoters and Publication.
- Dr M.B.Gohil, Dr J.N.Patel, Dr Gagiben.J.Rajpara,Prof G.P.Vadoria “*Elements of Civil Engineering*” Atul Prakshan.
- B.K.Shukla ““*Elements of Civil Engineering*” Atul Prakshan.
- R.S.Khurmi ,J.K.Gupta “*Thermal Engineering*”S Chand.
- Dr C D Sankhvara “*Element of Mechanical Engineering*” Akshat Publication.