

# LESSON PLAN

**Name of the Faculty** : Mr. Sarwan Kumar (Theory, Practical)  
**Discipline** : (Mechanical Engineering)  
**Semester** : 4<sup>TH</sup>  
**Subject** : HYDRAULICS AND HYDRAULIC MACHINES  
**Lesson plan Duration** : 15 weeks(from January, 2018)  
**Workload per week in hours** : Lectures-03, Practicals-02

Week	Theory		Practical	
	Lecture Day	Topic(including assignment test)	Practical Day	Topic
1 <sup>st</sup>	1	Fluid, types of fluid,	1 <sup>st</sup>	Measurement of pressure head by employing. i) Piezometer tube
	2	properties of fluid viz mass density, weight density		
	3	kinematics inversion, equivalent linkages specific volume, capillarity, specific gravity, viscosity, compressibility,		
2 <sup>nd</sup>	4	surface tension, kinematic viscosity and dynamic viscosity and their units.,	2 <sup>nd</sup>	) Single and double column manometer
	5	Concept of pressure (Atmospheric Pressure, gauge pressure, absolute pressure), Pascal's Law, Static Pressure,		
	6	Pressure measuring devices: peizometer tube manometers - simple U-tube, differential single column, inverted U-tube, micromanometer		
3 <sup>rd</sup>	7	Bourdon pressure gauge, Diaphragm pressure gauge, dead weight pressure gauge	3 <sup>rd</sup>	To find out the value of coefficient of discharge for a venturimeter.
	8	problems		
	9	Test		

4 <sup>th</sup>	10	Types of fluid flow – steady and unsteady, uniform and non-uniform, laminar and turbulent,;	4 <sup>th</sup>	Measurement of flow by using venturimeter.
	11	rate of flow and their units; continuity equation of flow; potential energy of a flowing fluid;		
	12	total head; Bernoulli's theorem (statement and proof) and its applications. Discharge measurement with the help of venturimeter, orifice meter,		
5 <sup>th</sup>	13	pitot-tube, limitations of Bernoulli's theorem simple problems.	5 <sup>th</sup>	Verification of Bernoulli's theorem.
	14	Assignment		
	15	Definition of pipe flow, wetted perimeter, hydraulic mean depth, hydraulic gradient;		
6 <sup>th</sup>	16	loss of head due to friction; Chezy's equation and Darcy's equation of head loss (without proof)	6 <sup>th</sup>	To find coefficient of friction for a pipe (Darcy's friction).
	17	Reynold's number and its effect on pipe friction; siphon, Nozzle - definition		
	18	velocity of liquid flowing through the nozzle, power developed. Water hammer, anchor block, syphon, surge tank (concept only).		
7 <sup>th</sup>	19	Loss of head in pipes due to sudden enlargement, sudden contraction, obstruction on flow path, change of direction and pipe fittings (without proof)	7 <sup>th</sup>	To study hydraulic circuit of an automobile brake and hydraulic ram.
	20	Test		
	21	Cc, Cv, Cd, flow through drowned		
8 <sup>th</sup>	22	, partially drowned orifices, time for emptying a tank through a circular orifice	8 <sup>th</sup>	Study the working of a Pelton wheel and Francis turbine.
	23	Simple problems.		
	24	Assignment		
9 <sup>th</sup>	25	Description, operation and application of hydraulic systems – hydraulic ram	9 <sup>th</sup>	To study a single stage centrifugal pump for constructional details and its operation to find out its normal head and discharge.
	26	hydraulic jack, hydraulic brake, hydraulic accumulator, hydraulic door closer,		
	27	hydraulic press, selection of specification of above systems for different applications		

<b>10<sup>th</sup></b>	<b>28</b>	Simple problems.	<b>10<sup>th</sup></b>	To study a single stage centrifugal pump for constructional details and its operation to find out its normal head and discharge.
	<b>29</b>	Concept of a turbine		
	<b>30</b>	types of turbines –impulse and reaction type (concept only),		
<b>11<sup>th</sup></b>	<b>31</b>	difference between them	<b>11<sup>th</sup></b>	Revision
	<b>32</b>	Construction and working of pelton wheel,		
	<b>33</b>	Francis turbine,		
<b>12<sup>th</sup></b>	<b>34</b>	Propeller and Kaplan turbines	<b>12<sup>th</sup></b>	Revision
	<b>35</b>	Unit speed, unit power, unit discharge,		
	<b>36</b>	specific speed of turbines, selection of turbines based on specific speed.		
<b>13<sup>th</sup></b>	<b>37</b>	Concept of hydraulic pump, single acting reciprocating pump (construction and operation only)	<b>13<sup>th</sup></b>	problems
	<b>38</b>	vane, screw and gear pumps.		
	<b>39</b>	Construction, working and operation of centrifugal pump.		
<b>14<sup>th</sup></b>	<b>40</b>	Performance, efficiencies and specifications of a centrifugal pump.	<b>14<sup>th</sup></b>	problems
	<b>41</b>	Trouble shooting and problems in centrifugal pumps and remedial measures,		
	<b>42</b>	pitting, cavitation, priming		
<b>15<sup>th</sup></b>	<b>43</b>	Simple problems.	<b>15<sup>th</sup></b>	Test
	<b>44</b>	Assignment		
	<b>45</b>	Test		



**WORKSHOP PRACTICE - II**  
**LESSON PLAN**

**TURNING SHOP**

**Name of Faculty : Sh Manjeet Kaushik, W/I**

Discipline : Mech. Engg.

Semester : IV

Subject : Workshop Practice II

Work Load : Practicals 09 Period/ week

Practical Plan: 15 week from January 2018

Week		Practical	Practicals
		Day	Topic
1		1	Introduction to Single Point Cutting Tool and Multipoint Cutting Tool, Brief Introduction of Grinder, Its parts and Safety Precaution. Cleaning, Oiling and greasing of Machine
		2	Practice a job of Grinding of Single Point turning Tool
		3	-do-
2		1	Introduction of Lathe Machine, Explain Parts of Lathe Machine and different operations of Lathe Machine, Cleaning, Oiling and greasing of Lathe Machine tools, Explain Safety
		2	
		3	-do-
3		1	Practice a job of Step Turning Operation
		2	Practice a job involving Turning, Taper Turning, External Thread Cutting, Knurling
		3	-do-
4		1	Introduction to Single Point Cutting Tool and Multipoint Cutting Tool, Brief Introduction of Grinder, Its parts and Safety Precaution. Cleaning, Oiling and greasing of Machine
		2	Practice a job of Grinding of Single Point turning Tool
		3	-do-
5		1	Introduction of Lathe Machine, Explain Parts of Lathe Machine and different operations of Lathe Machine, Cleaning, Oiling and greasing of Lathe Machine tools
		2	Practice a job of Simple Turning Operation
		3	Practice a job involving Turning, Taper Turning, External Thread Cutting, Knurling

## ADVANCE FITTING SHOP

<b>Name of Faculty : Sh. Manjeet Kaushik, W/I</b>			
Discipline :		Mech. Engg.	
Semester :		IV	
Subject :		Workshop Practice II	
Work Load :		Practicals 09 Period/ week	
Practical Plan: 15 week from January 2018			
Week		Practical Day	Practical Topic
1		1	Introduction of Drilling Machine, Explain its Parts and Working of Drilling machine, Cleaning, Oiling and greasing of Drilling Machine, Explain Safety Precautions.
		2	Prepare jobs on Drilling and Reaming
		3	-do-
2		1	Prepare jobs on Counter Boring, Counter Sinking and Taping
		2	-do-
		3	Practice jobs on Dovetail fitting in Mild Steel
3		1	-do-
		2	Practice Jobs on Radius fitting in mild steel
		3	Practice Jobs on Pipe Threading With die
4		1	Prepare jobs on Drilling and Reaming
		2	Prepare jobs on Counter Boring, Counter Sinking and Taping
		3	Prepare jobs on Drilling and Reaming
5		1	Practice jobs on Dovetail fitting in Mild Steel
		2	Practice Jobs on Radius fitting in mild steel
		3	Practice Jobs on Pipe Threading With die

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## MACHINE SHOP

Name of Faculty : Sh. Manjeet Kaushik, W/I

Discipline : Mech. Engg.

Semester : IV

Subject :		Workshop Practice II	
Work Load :		Practicals 09 Period/ week	
Practical Plan: 15 week from January 2018			
Week		Practical Day	Practicals
			Topic
1		1	Introduction of Shaper Machine, Explain Parts of Shaper Machine, Cleaning Oiling and Greasing of Shaper Machine, Explain Safety Precautions.
		2	Prepare a V-Block upto 0.5 mm accuracy on Shaper Machine
		3	-do-
2		1	-do-
		2	Exercise on keyway cutting and spline cutting on shaper machine
		3	-do-
3		1	Introduction of Shaper Machine, Explain Parts of Shaper Machine, Cleaning Oiling and Greasing of Shaper Machine, Explain Safety Precautions.
		2	Prepare a V-Block upto 0.5 mm accuracy on Shaper Machine
		3	Exercise on keyway cutting and spline cutting on shaper machine
4		1	Introduction of Shaper Machine, Explain Parts of Shaper Machine, Cleaning Oiling and Greasing of Shaper Machine, Explain Safety Precautions.
		2	Prepare a V-Block upto 0.5 mm accuracy on Shaper Machine
		3	Exercise on keyway cutting and spline cutting on shaper machine
5		1	Introduction of Shaper Machine, Explain Parts of Shaper Machine, Cleaning Oiling and Greasing of Shaper Machine, Explain Safety Precautions.
		2	Prepare a V-Block upto 0.5 mm accuracy on Shaper Machine
		3	Exercise on keyway cutting and spline cutting on shaper machine

**Name of the Faculty** : Yet To Be Assigned  
**Discipline** :(Mechanical Engineering)  
**Semester** : 4<sup>TH</sup>  
**Subject** :MATERIALS AND METALLURGY  
**Lesson plan Duration** : 15 weeks(from January, 2018)  
**Workload per week in hours** : Lectures-03, Practicals-02

Week	Theory		Practical	
	Lecture Day	Topic(including assignment test)	Practical Day	Topic
1 <sup>st</sup>	1	Material, History of Material Origin, Scope of Material Science	1 <sup>st</sup>	Classification of about 25 specimens of materials/machine parts into (i) Metals and non metals (ii) Metals and alloys
	2	Overview of different engineering materials and applications,		
	3	Classification of materials, Thermal, Chemical, Electrical, Mechanical properties of various materials,		
2 <sup>nd</sup>	4	Present and future needs of materials, Overview of Biomaterials and semiconducting materials.,	2 <sup>nd</sup>	Classification of about 25 specimens of materials/machine parts into (iii) Ferrous and non ferrous metals (iv) Ferrous and non ferrous alloys
	5	Various issues of Material Usage-Economical, Environment and Social.		
	6	Crystallography Fundamentals: Crystal, Unit Cell, Space Lattice, Arrangement of atoms in Simple Cubic Crystals		
3 <sup>rd</sup>	7	BCC, FCC and HCP Crystals,	3 <sup>rd</sup>	Problems
	8	problems		
	9	Test		
4 <sup>th</sup>	10	Number of atoms per unit Cell, Atomic Packing Factor.	4 <sup>th</sup>	Given a set of specimen of metals and alloys (copper, brass, aluminium, cast iron, HSS, Gun metal); identify and indicate the various properties possessed by them.
	11	Deformation: Overview of deformation behaviour and its mechanisms;		
	12	Behavior of material under load and stress-strain.		
5 <sup>th</sup>	13	Failure Mechanisms: Overview of failure modes,	5 <sup>th</sup>	revision



	<b>14</b>	Assignment		
	<b>15</b>	fracture, fatigue and creep.		
<b>6<sup>th</sup></b>	<b>16</b>	Metals And Alloys Introduction: History and development of iron and steel	<b>6<sup>th</sup></b>	Study of heat treatment furnace.
	<b>17</b>	Different iron ores,Raw Materials in Production of Iron and Steel,		
	<b>18</b>	Basic Process of iron-making andsteel-making,		
<b>7<sup>th</sup></b>	<b>19</b>	Classification of iron and steel,	<b>7<sup>th</sup></b>	To prepare specimens of following materials for microscopic examination and to Examine the microstructure of the specimens of following materials: i) Brass ii)Copper iii)Grey iv)Malleable v)Low carbon steel vi)High carbon steel vii) HSS
	<b>20</b>	Test		
	<b>21</b>	Cast Iron: Different types of Cast Iron, manufacture and their usage.		
<b>8<sup>th</sup></b>	<b>22</b>	Steels: Steels and alloy steel, Classification of plain carbon steels,	<b>8<sup>th</sup></b>	To prepare specimens of following materials for microscopic examination and to Examine the microstructure of the specimens of following materials: i) Low carbon steel ii)High carbon steel iii) HSS
	<b>23</b>	Simple problems.		
	<b>24</b>	Assignment		
<b>9<sup>th</sup></b>	<b>25</b>	Availability,Properties and usage of different types of Plain Carbon Steels,	<b>9<sup>th</sup></b>	To anneal a given specimen and find out difference in hardness as a result of annealing.
	<b>26</b>	Effect of variousalloys on properties of steel,		
	<b>27</b>	Uses of alloy steels (high speed steel, stainlesssteel, spring steel, silicon steel)		
<b>10<sup>th</sup></b>	<b>28</b>	Simple problems.	<b>10<sup>th</sup></b>	Revision
	<b>29</b>	Non Ferrous Materials: Properties and uses of Light Metals and their alloys		
	<b>30</b>	properties and uses of White Metals and their alloys.		
<b>11<sup>th</sup></b>	<b>31</b>	Test	<b>11<sup>th</sup></b>	To normalize a given specimen and to find out the difference in hardness as a
	<b>32</b>	Theory of Heat Treatment ,Purpose of heat treatment,		

	<b>33</b>	Solid solutions and its types, Iron Carbon diagram,		result of normalizing
<b>12<sup>th</sup></b>	<b>34</b>	Formation and decomposition of Austenite, Martensitic Transformation – Simplified Transformation Cooling Curves	<b>12<sup>th</sup></b>	Revision
	<b>35</b>	heat treatment processes hardening, tempering, annealing, normalizing, Case hardening and surface hardening, Types of heat treatment furnaces required for above operations (only basic idea)		
	<b>36</b>	Engineering Plastics Important sources of plastics, Classification-thermoplastic and thermo set and their uses, speed.		
<b>13<sup>th</sup></b>	<b>37</b>	Various Trade names of engg. Plastics, Plastic Coatings.	<b>13<sup>th</sup></b>	Revision
	<b>38</b>	Advanced Materials Composites-Classification, properties, applications Ceramics-Classification,		
	<b>39</b>	properties, applications Heat insulating materials		
<b>14<sup>th</sup></b>	<b>40</b>	Miscellaneous Materials Properties and uses of Asbestos, Glass wool, thermocole, cork, mica	<b>14<sup>th</sup></b>	To harden and temper a specimen and to find out the difference in hardness due to tempering.
	<b>41</b>	Overview of tool and die materials, Materials for bearing metals, Spring materials,		
	<b>42</b>	Materials for Nuclear Energy, Refractory materials.		
<b>15<sup>th</sup></b>	<b>43</b>	Simple problems.	<b>15<sup>th</sup></b>	Revision
	<b>44</b>	Assignment		
	<b>45</b>	Test		

**Name of the Faculty** : Ms. Suman Rani(Theory)  
**Discipline** : (Mechanical Engineering)  
**Semester** : 4<sup>TH</sup>  
**Subject** : MACHINE DESIGN AND DRAWING  
**Lesson plan Duration** : 15 weeks(from January, 2018)  
**Workload per week in hours** : Lectures-06

Week	Theory	
	Lecture Day	Topic(including assignment test)
1 <sup>st</sup>	1	1.1 Design – Definition, Type of design, necessity of design
	2	Comparison of designed and undesigned work
	3	Design procedure
	4	Characteristics of a good designer
	5	Design terminology: stress, strain, factor of safety
	6	factors affecting factor of safety, stress concentration,
2 <sup>nd</sup>	7	stress concentration, methods to reduce stress concentration,
	8	fatigue, endurance limit.
	9	Revision
	10	General design consideration
	11	Codes and Standards (BIS standards)
	12	Codes and Standards (BIS standards)
3 <sup>rd</sup>	13	Assignment
	14	Test
	15	Engineering materials and their mechanical properties
	16	Properties of engineering materials: elasticity, plasticity, malleability, ductility

	17	toughness, hardness and resilience. Fatigue, creep, tenacity, strength
	18	Selection of materials,
4 <sup>th</sup>	19	criterion of material selection
	20	Design Failure
	21	Various design failures-maximum stress theory,
	22	Assignment
	23	Test
	24	maximum strain theory
	25	maximum strain energy theory
5 <sup>th</sup>	26	Simple Problems
	27	Classification of loads
	28	Design under tensile loads.
	29	Design under compressive loads.
	30	Simple Problems,
	31	Design under torsional loads.
6 <sup>th</sup>	32	Design of Shaft
	33	Type of shaft, shaft materials,
	34	Type of loading on shaft, standard sizes of shaft available
	35	3.2 Shaft subjected to torsion only
	36	determination of shaft diameter (hollow and solid shaft) on the basis of : - Strength criterion
	37	determination of shaft diameter (hollow and solid shaft) on the basis of : Rigidity criterion Determination of shaft dia (hollow and solid shaft) subjected to bending
	38	problems
39	Revision	

	<b>40</b>	Determination of shaft dia (hollow and solid shaft) subjected to combined torsion
	<b>41</b>	Determination of shaft dia (hollow and solid shaft) subjected to combined bending .
	<b>42</b>	Test
<b>8<sup>th</sup></b>	<b>43</b>	Design of Key
	<b>44</b>	Failure of key (by Shearing and Crushing).
	<b>45</b>	Design of key (Determination of key dimension)
	<b>46</b>	Effect of keyway on shaft strength. (Figures and problems)
	<b>47</b>	Assignment
	<b>48</b>	Test
<b>9<sup>th</sup></b>	<b>49</b>	Design of Screwed Joints
	<b>50</b>	Introduction, Advantages and Disadvantages of screw joints,
	<b>51</b>	location of screw joints.
	<b>52</b>	Important terms used in screw threads, designation of screw threads
	<b>53</b>	Initial stresses due to screw up forces, stresses due to combined forces
	<b>54</b>	stresses due to combined forces
<b>10<sup>th</sup></b>	<b>55</b>	Design of power screws (Press)
	<b>56</b>	.4 Design of power screws ( screw jack)
	<b>57</b>	.4 Design of power screws ( screw clamp)
	<b>58</b>	Revision
	<b>59</b>	Assignment
	<b>60</b>	Test

<b>11<sup>th</sup></b>	<b>61</b>	Cams
	<b>62</b>	Types of cams and followers (theoretical)
	<b>63</b>	Revision
	<b>64</b>	Profile of cams for imparting following motion with knife edge follower
	<b>65</b>	Assignment
	<b>66</b>	Test
<b>12<sup>th</sup></b>	<b>67</b>	Profile of cams for imparting following motion with roller followers
	<b>68</b>	• Uniform motion
	<b>69</b>	problems
	<b>70</b>	Revision
	<b>71</b>	Assignment
	<b>72</b>	Test
<b>13<sup>th</sup></b>	<b>73</b>	Simple harmonic motion
	<b>74</b>	Sample paper
	<b>75</b>	• Uniformity accelerated and retarded motion
	<b>76</b>	Revision
	<b>77</b>	Assignment
	<b>78</b>	Test dc
<b>14<sup>th</sup></b>	<b>79</b>	Gears
	<b>80</b>	Nomenclature of gears and conventional representation
	<b>81</b>	Revision
	<b>82</b>	Revision
	<b>83</b>	Assignment
	<b>84</b>	Test

<b>15<sup>th</sup></b>	<b>85</b>	Drawing the actual profile of involute teeth gear by different methods
	<b>86</b>	Revision
	<b>87</b>	Drawing the actual profile of involute teeth gear by different methods
	<b>88</b>	Revision
	<b>89</b>	Assignment
	<b>90</b>	Test

: Yet To Be Assigned  
 : Mechanical Engineering  
 : IV  
 : I.C. Engines  
 n : 15 Weeks ( 9 January onwards)

Theory	Practical Day	
Topic ( Including assignment/test)	Practical Day	Topic
Introduction I.C. Engines ,its Types & Classifications	1	Study of a two stroke engine using cut section model, note the function and Material of each part.
Working principle of two stroke cycle.		
Working principle of four stroke cycle.		
SI engines and CI Engines	2	Checking of practical copy/ viva/Revision.
Working of Otto cycle, and Diesel cycle.		
Working Principle of Dual cycle.		
Location and functions of various parts of IC engines.	3	Study of a four stroke engine using cut section model. Note the function of each Part.
Materials used for various parts of IC engines.		
Concept of IC engine terms: bore, stroke, dead centre, crank throw, compression ratio, piston displacement, piston speed.		
Concept of carburetion.	4	Checking of practical copy/ viva/Revision
Air fuel ratio.		
Simple carburetor and its application.		
MPFI, Common rail system.	5	Study of battery ignition system of a multi-cylinder petrol engine stressing ignition timings, setting, fixing order and contact breaker; gap adjustment.
super charging and turbo charger.		
SESSIONAL TEST -1/ ASSIGNMENT-1		
SESSIONAL TEST-1 / ASSIGNMENT-1	6	Checking of practical copy/ viva/Revision
Components of fuel system.		
Description and working of fuel feed pump.		
Fuel injection pump.	7	Study of cooling of IC engine.
Various types of Injectors.		
Description of battery coil ignition system.		
Magnet ignition system	8	Study of lubricating system of IC engine.
Electronic ignition system.		
Fault finding in ignition system.		
remedial action for ignition system		Checking of practical copy/





## Lesson Plan

<b>Name of faculty member</b>	<b>Yet To Be Assigned</b>			
<b>Discipline</b>	MECHANICAL ENGINEERING			
<b>Subject</b>	WORKSHOP TECHNOLOGY-II			
<b>Semester</b>	4 <sup>th</sup> (section-A&B)			
<b>Lesson plan duration</b>	15 weeks ( January 2018 -April 2018)			
<b>Work Load (Lecturer/ Practical) per week (In hours)</b>	03 LECTURES PER WEEK			
<b>Weeks</b>	<b>Theory</b>			
	<b>Lecturer day</b>	<b>Topics</b>	<b>Practical day</b>	<b>Topic</b>
1st	1st	<b>Unit 1- Cutting Tools and Cutting Materials</b> Cutting Tools - Various types of single point cutting tools and their uses	NA	NA
	2nd	Single point cutting tool geometry, tool signature and its effect, Heat produced during cutting and its effect		
	3rd	Cutting speed, feed and depth of cut and their effect, Properties of cutting tool material, Study various cutting tool materials viz. High-speed steel		
2nd	4th	Tungsten carbide, cobalt steel cemented carbides, stellite, ceramics and diamond.	NA	NA
	5th	<b>Unit 2 Lathe</b> Principle of turning		
	6th	Function of various parts of a lathe, Classification and specification of various types of lathe		
3rd	7th	Work holding devices	NA	NA

	8th	Lathe tools and operations :- Plain and step turning, facing, parting off		
	9th	taper turning, eccentric turning, drilling, reaming, boring, threading and knurling, form turning, spinning		
4th	10th	Cutting parameters – Speed, feed and depth of cut for various materials and	NA	NA
	11th	Speed ratio, preferred numbers of speed selection.		
	12th	Lathe accessories:- Centers, dogs, different types of chucks, collets, face		
5th	13th	milling attachment, Quick change device for tools, Introduction to capstan and turret lathe	NA	NA
	14th	<b>SESSIONAL TEST I</b>		
	15th	<b>Unit 3 Drilling</b> Principle of drilling, Classification of drilling machines and their description Various operation performed on drilling machine – drilling, spot facing, reaming, boring, counter boring, counter sinking, hole milling, tapping		
6th	16th	Speeds and feeds during drilling, impact of these parameters on drilling, machining time.	NA	NA
	17th	Types of drills and their features, nomenclature of a drill		
	18th	Drill holding devices		
7th	19th	Revision of reaming, boring, counter boring	NA	NA
	20th	<b>Unit 4 Boring</b> Principle of boring		
	21st	Classification of boring machines and their brief description		
8th	22nd	Boring tools, boring bars and boring heads	NA	NA

	23rd	<b>Unit 5 Shaping, Planing and Slotting</b>		
	24th	Type of shapers		
9th	25th	Type of planers	NA	NA
	26th	Types of tools used and their geometry.		
	27th	Speeds and feeds in above processes		
10th	28th	<b>SESSIONAL TEST II</b>	NA	NA
	29th	<b>Unit 6 Broaching</b> Introduction Types of broaching machines – Single ram and duplex ram horizontal type		
	30th	vertical type pull up, pull down, push down.		

11 <sup>th</sup>	31st	Elements of broach tool, broach tooth details – nomenclature, types, and tool material	NA	NA
	32nd	<b>Unit 7 Jigs and Fixtures</b> Importance and use of jigs and fixture		
	33rd	Principle of location		
12th	34th	Locating devices	NA	NA
	35th	Clamping devices		

	36th	Advantages of jigs and fixtures		
13th	37th	<b>Unit 8 Cutting Fluids and Lubricants</b> Function of cutting fluid	NA	NA
	38th	Types of cutting fluids		
	39th	Difference between cutting fluid and lubricant		
14th	40th	Revision of reaming, boring, counter boring	NA	NA
	41st	revision of jig and fixture		
	42nd	Selection of cutting fluids for different materials and operations		
15th	43rd	Common methods of lubrication of machine tools	NA	NA
	44th	Revision of whole syllabus		
	45th	<b>SESSIONAL TEST III</b>		

