

LESSON PLAN

Fr. CRCE (Production)

Academic year: 2018-19

Fr. Conceicao Rodrigues College Of Engineering

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

Department of Production Engineering

S.E. (Production) (Semester III) (2018-2019)

Lecture Plan

Subject: Manufacturing Engineering-I

Credits - 03

Module	Contents	Hrs
01	Introduction to Manufacturing Processes: Definition, need and classification of manufacturing process based on chip-less and chip-removal processes. Various generating & forming processes. Classification of machine tools based on form of the work piece and on field of application. Cutting off Machines: Power hacksaws, band saw and circular saw, friction saw and abrasive cutting off machines, field of applications and limitations.	06
02	Lathe Machine: Lathe operations, Turning parameters (speed, feed, depth of cut, MMR), Lathe Components, Lathe specifications, work and tool holding devices & accessories, single point cutting tool nomenclature, Taper turning types, lathe machines types and their difference. Machining time (Numerical).	08
03	3.1 Drilling machine: Drilling operations, work and tool holding devices, Drill nomenclature, Drilling machine types, Deep hole drilling (fundamentals only), Introduction to Boring & Boring machine. Machining time (Numerical). 3.2 Broaching Machine: Broaching process, circular broach nomenclature and types of broaches, broaching machine types, Advantages and Limitations.	06
04	4.1 Milling Machine: Milling operations and their difference, Milling Parameters, special attachments (Dividing head) and accessories, milling machines types, Types of Milling cutters and Machining time (Numerical). 4.2 Reciprocating Machine: Shaping machines: types of shapers, working of shaping machine, quick return mechanisms, shaper operations, Machining time. Planing machines: types of planing machines, shaper vs. planer. Slotting machines types of slotting machines.	10
05	Screw Threads: Thread production process – Machining (thread chasing, thread milling, thread whirling, and die threading & tapping), Thread rolling, Thread grinding. (Tool geometry omitted). Gear Teeth: Gear hobbing, principles of hobbing (kinematics omitted). Hobbing techniques, hob material (tool geometry omitted). Gear finishing processes-gear shaving, gear lapping, gear grinding and gear burnishing.	08
06	6.1 Grinding Machine: Grinding principle, Grinding machines types and operations, grinding wheels specification, balancing of grinding wheels, truing, dressing and shaping of grinding wheels.	10

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	6.2 Finishing Process: Reaming and Honing process, Lapping–process, lap materials, medium, vehicles. Super finishing process (Polishing, Buffing) – equipment and fluids. Roller burnishing-process.	
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Co No.	Course Outcomes
CO1	Describe types of machine tools, their classification, specifications and constructional features.
CO2	Illustrate machine tools capabilities, limitations of machining operations to generate cylindrical, circular and planar components.
CO3	Demonstrate different kinds of cutting tools with their significance of work-piece interface.
CO4	Describe features and applications of screw thread processes.
CO5	Describe features and applications of gear manufacturing processes.
CO6	Demonstrate finishing processes like grinding, reaming, honing, lapping and burnishing.

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	-	-	-	-	-	-	-	-	2
CO2	3	3	2	-	-	-	-	-	-	-	-	3
CO3	3	3	-	-	-	-	-	-	-	-	-	-
CO4	3	3	3	-	3	-	-	-	-	-	-	3
CO5	3	3	3	-	-	-	-	-	-	-	-	3
CO6	3	3	3	-	-	-	-	-	-	-	-	3

Target = 2 for all COs

FINAL CO	=	(0.8* Direct) + (0.2* Indirect)
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Direct	CO1	(0.7*Test) +(0.3*Univ Exam)
	CO2	(0.7*Test) +(0.3*Univ Exam)
	CO3	(0.7*Test) +(0.3*Univ Exam)
	CO4	(0.7*Test) +(0.3*Univ Exam)
	CO5	(0.7*Test) +(0.3*Univ Exam)

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	CO6	(0.7*Test) +(0.3*Univ Exam)
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Indirect	CO1	(1*Exit Survey)
	CO2	(1*Exit Survey)
	CO3	(1*Exit Survey)
	CO4	(1*Exit Survey)
	CO5	(1*Exit Survey)
	CO6	(1*Exit Survey)

Lecture Plan

Week No.	Topics	Module	Hours
<u>Week 1</u> (01/08/18 – 03/08/18)	Course Objectives, Course Outcomes (COs), Textbook, Introduction, Definition, need and classification of manufacturing process based on chip-less and chip-removal processes. Various generating & forming processes. Classification of machine tools based on form of the work piece and on field of application. Cutting off Machines: Power hacksaws, band saw and circular saw, friction saw and abrasive cutting off machines, field of applications and limitations.	1	3
<u>Week 2</u> (06/08/18 – 10/08/18)	Lathe operations, Turning parameters (speed, feed, depth of cut, MMR), Lathe Components, Lathe specifications, work and tool holding devices & accessories,	2	4
<u>Week 3</u> (20/08/18 – 24/08/18)	single point cutting tool nomenclature, Taper turning types, lathe machines types and their difference. Machining time (Numerical).	2	4
<u>Week 4</u> (27/08/18 – 31/08/18)	3.1 Drilling machine: Drilling operations, work and tool holding devices, Drill nomenclature, Drilling machine types, Deep hole drilling (fundamentals only), Introduction to Boring & Boring machine. Machining time (Numerical).	3	4
<u>Week 5</u> (4/09/18 – 07/09/18)	3.2 Broaching Machine: Broaching process, circular broach nomenclature and types of broaches, broaching machine types, Advantages and Limitations. 4.1 Milling Machine: Milling operations and their difference, Milling Parameters, special attachments (Dividing head) and accessories,	3,4	4

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<p><u>Week 6</u> (10/09/18 – 12/09/18)</p>	<p>milling machines types, Types of Milling cutters and Machining time (Numerical). 4.2 Reciprocating Machine: Shaping machines: types of shapers, working of shaping machine, quick return mechanisms, shaper operations, Machining time. Planing machines: types of planing machines, shaper vs. planer. Slotting machines types of slotting machines.</p>	4	3
<p><u>Week 7</u> (18/09/18 – 21/09/18)</p>	<p>Screw Threads: Thread production process – Machining (thread chasing, thread milling, thread whirling, and die threading & tapping), Thread rolling, Thread grinding. Gear Teeth: Gear hobbing, principles of hobbing (kinematics omitted). Hobbing techniques, hob material (tool geometry omitted).</p>	5	4
<p><u>Week 8</u> (24/09/18– 28/09/18)</p>	<p>Gear finishing processes-gear shaving, gear lapping, gear grinding and gear burnishing. 6.1Grinding Machine: Grinding principle, Grinding machines types and operations, grinding wheels specification, balancing of grinding wheels, truing, dressing and shaping of grinding wheels.</p>	5,6	4
<p><u>Week 9</u> (01/10/18 – 05/10/18)</p>	<p>6.2 Finishing Process: Reaming and Honing process, Lapping–process, lap materials, medium, vehicles. Super finishing process (Polishing, Buffing) – equipment and fluids. Roller burnishing-process. Numerical Practice on machining time calculation</p>	6	6
<p><u>Week 10</u> (10/10/18 – 12/10/18)</p>	<p>Unit Test 2 (April 8, 9 and 10)</p>	-	-