TENTATIVE LESSON PLAN: R1622031
KINEMATICS OF MACHINERY

Course Title: KINEMATICS OF MACHINERY		
Section : Sec A	**Date : 18-11-2019**	**Page No : 01 of 05**
Revision No : 00	**Prepared By : BALA CHINALINGAM VANAM**	**Approved By : HOD**

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I MECHANISMS			
CO1: The objective of this unit is to make student understand the purpose of kinematics, Kinematic joint and mechanism and to study the relative motion of parts in a machine without taking into consideration the forces involved.			
TB:			
1	Elements or Links – Classification – Rigid Link, flexible and fluid link	18-11-2019	Lecture interspersed with discussions
2	Types of kinematic pairs – sliding, turning, rolling, screw and spherical pairs	19-11-2019	
3	lower and higher pairs – closed and open pairs – constrained motion	20-11-2019	
4	completely, partially or successfully constrained and incompletely constrained	21-11-2019	
5	Khubralrs criteria , Grashoff's law , Degrees of freedom	22-11-2019	
6	Kutzbach criterian for planar mechanisms, Mechanism and machines	23-11-2019	
7	classification of machines – kinematic chain – inversion of mechanism	25-11-2019	
8	Inversion of mechanism – inversions of quadric cycle, chain – single and double slider cranks chains.	26-11-2019	
UNIT-II LOWER PAIR MECHANISM			
CO2: The objective of this unit is to make student understand various mechanisms for straight line motion and their applications including steering mechanism.			
TB:			
9	Exact and approximate copiers and generated types – Peaucellier	26-11-2019	
10	Hart and Scott Russul – Grasshopper – Watt T.	27-11-2019	

	Chebicheff		Lecture interspersed with discussions
11	Robert Mechanisms and straight line motion, Pantograph	28-11-2019	
12	Conditions for correct steering – Davis Steering gear	29-11-2019	
13	Ackermans steering gear	30-11-2019	
14	velocity ratio; Hooke's Joint: Single and double	2-12-2019	
15	Universal coupling–application–problems.	2-12-2019	
UNIT-III KINEMATICS **CO3: The objective of this unit is to make student understand the velocity and acceleration concepts and the methodology using graphical methods and principles and application of four bar chain. To understand the application of slider crank mechanism etc. and study of plane motion of the body.** **TB:**			
16	Velocity and acceleration – Motion of a link in machine	2-12-2019	Lecture interspersed with discussions
17	Determination of Velocity and acceleration diagrams – Graphical method	3-12-2019	
18	Application of relative velocity method four bar chain.	4-12-2019	
19	Velocity and acceleration analysis of for a given mechanism	5-12-2019	
20	Kleins construction, Coriolis acceleration, determination of Coriolis component of acceleration.	6-12-2019	
21	Plane motion of body: Instantaneous center of rotation,centroids and axodes	7-12-2019	
22	relative motion between two bodies – Three centres in line theorem	10-12-2019	
23	Graphical determination of instantaneous centre	11-12-2019	
24	diagrams for simple mechanisms and determination of angular velocity of points and links	12-12-2019	

UNIT-IV CAMS

CO4: The objective of this unit is to make student understand the theories involved in cams.

TB:

25	Definitions of cam and followers – their uses	25-1-2020	Lecture interspersed with discussions
26	Types of followers and cams	27-1-2020	
27	Terminology –Types of follower motion	28-1-2020	
28	Uniform velocity, Simple harmonic motion and uniform acceleration and retardation	30-1-2020	
29	Maximum velocity	31-1-2020	
30	maximum acceleration during outward and return strokes in the above 3 cases.	1-2-2020	
31	Analysis of motion of followers	3-2-2020	
32	Roller follower	4-2-2020	
33	Circular cam with straight	5-2-2020	
34	concave and convex flanks	6-2-2020	

UNIT-V GEARS

CO5: The objective of this unit is to make student understand gears, power transmission through different types of gears including gear profiles and its efficiency.

TB:

35	Higher pairs, friction wheels	7-2-2020	Lecture interspersed with discussions
36	toothed gears–types	8-2-2020	
37	law of gearing	10-2-2020	
38	condition for constant velocity ratio for transmission of motion	12-2-2020	
39	Form of teeth: cycloidal and involute profiles	13-2-2020	
40	Velocity of sliding –phenomena of interferences	14-2-2020	
41	Methods of interference	17-2-2020	
42	Condition for minimum number of teeth to avoid interference,	20-2-2020	

43	expressions for arc of contact and path of contact	24-2-2020	
44	Introduction to Helical	26-2-2020	
45	Bevel	27-2-2020	
46	Worm gearing	28-2-2020	

UNIT-VI POWER TRANSMISSIONS

CO6: The objective of this unit is to make student understand various power transmission mechanisms and methodologies and working principles. Students are exposed to merits and demerits of each drive

TB:

47	introduction	29-2-2020	Lecture interspersed with discussions
48	Belt and rope drives	2-3-2020	
49	Selection of belt drive	3-3-2020	
50	Types of belt drives	3-3-2020	
51	V-belts	4-3-2020	
52	Materials used for belt and rope drives	5-3-2020	
53	Velocity ratio of belt drives	6-3-2020	
54	Slip of belt, creep of belt	7-3-2020	
55	Tensions for flat belt drive	11-3-2020	
56	Angle of contact	12-3-2020	
57	Centrifugal tension	13-3-2020	
58	Maximum tension of belt	14-3-2020	
59	Chains- length, angular speed ratio	16-3-2020	
60	Classification of chains	17-3-2020	
61	Introduction to gear Trains, Train value	18-3-2020	

62	Types – Simple and reverted wheel train	19-3-2020	
63	Epicyclic gear Train	19-3-2020	
64	Methods of finding train value or velocity ratio	20-3-2020	
65	Epicyclic gear trains	20-3-2020	
66	Selection of gear box	21-3-2020	
67	Differential gear for an automobile.	21-3-2020	

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TENTATIVE LESSON PLAN: R1622031
KINEMATICS OF MACHINERY

Course Title: KINEMATICS OF MACHINERY		
Section : Sec B	**Date : 18-11-2019**	**Page No :** 01 of 05
Revision No : 00	**Prepared By : BALA CHINALINGAM VANAM**	**Approved By : HOD**

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I MECHANISMS **CO1: The objective of this unit is to make student understand the purpose of kinematics, Kinematic joint and mechanism and to study the relative motion of parts in a machine without taking into consideration the forces involved.** **TB:**			
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13	Ackermans steering gear	30-11-2019	
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15	Universal coupling–application–problems.	2-12-2019	
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21	Plane motion of body: Instantaneous center of rotation,centroids and axodes	7-12-2019	
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23	Graphical determination of instantaneous centre	11-12-2019	
24	diagrams for simple mechanisms and determination of angular velocity of points and links	12-12-2019	

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CO4: The objective of this unit is to make student understand the theories involved in cams.

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26	Types of followers and cams	27-1-2020	
27	Terminology –Types of follower motion	28-1-2020	
28	Uniform velocity, Simple harmonic motion and uniform acceleration and retardation	30-1-2020	
29	Maximum velocity	31-1-2020	
30	maximum acceleration during outward and return strokes in the above 3 cases.	1-2-2020	
31	Analysis of motion of followers	3-2-2020	
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34	concave and convex flanks	6-2-2020	

UNIT-V GEARS

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TB:

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36	toothed gears–types	8-2-2020	
37	law of gearing	10-2-2020	
38	condition for constant velocity ratio for transmission of motion	12-2-2020	
39	Form of teeth: cycloidal and involute profiles	13-2-2020	
40	Velocity of sliding –phenomena of interferences	14-2-2020	
41	Methods of interference	17-2-2020	
42	Condition for minimum number of teeth to avoid interference,	20-2-2020	

43	expressions for arc of contact and path of contact	24-2-2020	
44	Introduction to Helical	26-2-2020	
45	Bevel	27-2-2020	
46	Worm gearing	28-2-2020	

UNIT-VI POWER TRANSMISSIONS

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56	Angle of contact	12-3-2020	
57	Centrifugal tension	13-3-2020	
58	Maximum tension of belt	14-3-2020	
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64	Methods of finding train value or velocity ratio	20-3-2020	
65	Epicyclic gear trains	20-3-2020	
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TENTATIVELESSON PLAN: R1631032

Course Title: THERMAL ENGINEERING-I		Course code: R1631032	
Section : Sec A	Date :17/11/2019	Page No : 01 to 03	
Revision No : 00	Prepared By:D.SREERAMPRASAD	Approved By : HOD	
Tools: BLACK BOARD,PPT			
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-IACTUAL CYCLES AND THEIR ANALYSYS **CO1:**sTo make the student learn and understand the effects of various losses that occur in the actual engines operations **TB: "IC ENINES,V.GANESANby 3rdEdition, Tata McGraw Hill Education Private Limited publications.**			
1	Introduction , comparison of air standard and actual	**18/11/2019**	Lecture interspersed with discussions
2	Time loss factor	**19/11/2019**	
3	Heat loss factor	**21/11/19**	
4	Exhaust blow down loss due to gas exchange process	**22/11/2019**	
5	Volumetric efficiency	**22/11/2019**	
6	Loss due to rubbing friction	**25/11/2019**	
7	Actual cycles of CI Engines	**26/11/2019**	
8	Fuel - air cycles of CI engines	**29/11/2019**	
UNIT-II IC ENGINES **CO2:**:To familiarize the student the various engine systems along with their function and necessity **TB:".IC ENINES,V.GANESANby 3rdEdition, Tata McGraw Hill Education Private Limited publications**			
1	Classifications of IC engines	**30/11/2019**	Lecture interspersed with discussions
18	working principles OF IC engines	**02/12/2019**	
19	Valve timing diagram	**4/12/2019**	
20	Port time diagram	**5/07/2018**	
21	Engine fuel supply systems	**6/12/2019**	
22	Engine carburetor systems	**7/12/2019**	
23	Engine ignition systems	**9/12/2019**	

24	Engine fuel injection systems	**10/12/2019**	
25	Cooling and lubrication	**11/12/2019**	
26	Principle of wankel engine	**12/12/2019**	
27	Principles of supercharging and turbo charging	**13/12/2019**	
UNIT-III COMBUSTION IN SIAND CI ENGINES **CO3:** To learn about normal combustion phenomenon and knocking in S.I and C.I engines and the several operating parameters and their effect the smooth engine operation **TB:. IC ENINES,V.GANESANby 3rdEdition, Tata McGraw Hill Education Private Limited publications**			
30	Combustion in SI engines Normal combustion, and abnormal combustion	**14//12/2019** **16/12/2019**	
31	Importance of flame speed and effect of engine variables	**17/12/2019**	
32	Types of abnormal combustion, pre-ignition and knocking	**18/12/2019**	
33	Fuel requirements and fuel rating	**19/12/2029**	Lecture interspersed with discussions
34	Anti knock additives	**20/12/2019**	
35	Combustion chambers-requirements, types	**26/12/2019**	
36	Combustion in CI engines; four stages of combustion	**27/12/2019**	
37	Delay period and its importance	**28/12/2019**	
38	Effect of engine variables- diesel knock	**2/1/2020**	
39	Need for air movement, suction, compression and combustion induced turbulence	**4/1/2020** **6/1/2020**	
40	Nozzles and fuel rating	**8/1/2020**	
UNIT-4 MEASUREMENT, TESTING AND PERFORMANCE OF IC ENGINES Co4. To make the students learn to perform testing on S.I and C.I Engines for the calculations of performance and emission parameters **. TB:. IC ENINES,V.GANESANby 3rdEdition, Tata McGraw Hill Education Private Limited publications**			
41	**Parameters of performance-measurement of cylinder pressure, fuel**	**22/1/2020**	Lecture interspersed with

	consumption, air intake, brake power	**27/1/2020**	discussions
42	Exhaust gas composition	**28/1/2020**	
43	**Determination of friction losses and indicated power**	**29/1/2020**	
44	**problems**	**30/1/2020**	
45	**problems**	**31/1/2020**	
46	**Performance test- heat balance sheet**	2/2/2020	
UNIT-V AIR COMPRESSORS-RECIPROCATING CO5:To make students learn about different types of compressors and to calculate power and efficiency of reciprocating compressors TB: THRMAL ENGINEERING by R.K.RAJPUT LAXMI PUBLICATIONS			
47	Classification- positive displacement and roto dynamic machinery	**4/2/2020**	Lecture interspersed with discussions
48	Power producing and power absorbing machines, fan ,blower and compressor	**5/2/2020**	
49	Positive displacement and dynamics types	**7/2/2020**	
50	Reciprocating and rotary types	**11/2./2020 12/2/2020**	
51	Reciprocating compressors; principles of operation, work required, isothermal efficiency	**13/2/2020 14/2/2020**	
52	Volumetric efficiency and effect of clearance	**18/2/2020 19/2/200**	
53	Stage compression, under cooling of reciprocating compressors	**21/2/2020**	
54	Saving of work, minimum work condition for stage compression	**23/2/2020 24/2/2020**	
UNIT-VI ROTARY COMPRESSORS **CO6:.:** To make students learn mechanical details and to calculate power and efficiency of rotary compressors **TB:** "THRMAL ENGINEERING by R.K.RAJPUT LAXMI PUBLICATIONS			
55	**Otto** To make students learn about different types of compressors and to calculate power and efficiency of reciprocating compressors **Diesel cycles**	**11/3/2020**	Lecture interspersed with discussions
56	**Dual combustion cycle, Sterling cycle**	**12/3/2020**	
57	**Ericcson cycle and Lenoir cycle**	**13/3/2020**	
58	**Comparison of cycles**	**16/3/2020**	
59	**Refrigeration cycles -brayton cycle and rankine cycle and performance evaluation**	**17/3/2020**	
60	**Bell-coleman cycle**	**18/3/2020**	

61	**Vapour compression cycle, performance evaluation**	**19/3/2020**	
62	**Problems**	**20/3/2020**	

Signature of Faculty
Date: 20/3/20

Signature of HOD
Date: 22/3/20

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TENTATIVELESSON PLAN: R1631032

Course Title: THERMAL ENGINEERING-I		Course code: R1631032	
Section : Sec B	Date :17/11/2019	Page No : 01 to 03	
Revision No : 00	Prepared By:D.SREERAMPRASAD	Approved By : HOD	
Tools: BLACK BOARD,PPT			

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-IACTUAL CYCLES AND THEIR ANALYSYS **CO1:**sTo make the student learn and understand the effects of various losses that occur in the actual engines operations **TB: "IC ENINES,V.GANESANby 3rdEdition, Tata McGraw Hill Education Private Limited publications.**			
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UNIT-III COMBUSTION IN SIAND CI ENGINES **CO3:** To learn about normal combustion phenomenon and knocking in S.I and C.I engines and the several operating parameters and their effect the smooth engine operation **TB:. IC ENINES, V.GANESANby 3rdEdition, Tata McGraw Hill Education Private Limited publications**			
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33	Fuel requirements and fuel rating	**19/12/2029**	
34	Anti knock additives	**21/12/2019**	
35	Combustion chambers-requirements, types	**26/12/2019**	
36	Combustion in CI engines; four stages of combustion	**27/12/2019**	
37	Delay period and its importance	**28/12/2019**	
38	Effect of engine variables- diesel knock	**2/1/2020**	
39	Need for air movement, suction, compression and combustion induced turbulence	**4/1/2020** **6/1/2020**	
40	Nozzles and fuel rating	**8/1/2020**	
UNIT-4 MEASUREMENT, TESTING AND PERFORMANCE OF IC ENGINES Co4. To make the students learn to perform testing on S.I and C.I Engines for the calculations of performance and emission parameters **TB:. IC ENINES, V.GANESANby 3rdEdition, Tata McGraw Hill Education Private Limited publications**			
41	**Parameters of performance-measurement of cylinder pressure, fuel**	**24/1/2020**	Lecture interspersed with

	consumption, air intake, brake power	**24/1/2020**	discussions
42	Exhaust gas composition	**28/1/2020**	
43	**Determination of friction losses and indicated power**	**29/1/2020**	
44	**problems**	**30/1/2020**	
45	**problems**	**31/1/2020**	
46	**Performance test- heat balance sheet**	2/2/2020	
UNIT-V AIR COMPRESSORS-RECIPROCATING CO5:To make students learn about different types of compressors and to calculate power and efficiency of reciprocating compressors TB: THRMAL ENGINEERING by R.K.RAJPUT LAXMI PUBLICATIONS			
47	Classification- positive displacement and roto dynamic machinery	**4/2/2020**	Lecture interspersed with discussions
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51	Reciprocating compressors; principles of operation, work required, isothermal efficiency	**14/2/2020 15/2/2020**	
52	Volumetric efficiency and effect of clearance	**18/2/2020 19/2/200**	
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57	**Ericcson cycle and Lenoir cycle**	**13/3/2020**	
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61	**Vapour compression cycle, performance evaluation**	**19/3/2020**	
62	**Problems**	**20/3/2020**	

Signature of Faculty
Date: 20/3/20

Signature of HOD
Date: 20/3/20

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TENTATIVE LESSON PLAN: R1622033

PRODUCTION TECHNOLOGY

Course Title: PRODUCTION TECHNOLOGY			
Section:A		Date:16/11/2019	
Revision No: 00	Prepared By: Mr. D ROGNATHA RAO		Approved By: HOD
Tools: Black board, PPTs			

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I CASTING **CO1:**To impart basic knowledge and understanding about the primary manufacturing processes. **TB:** 1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn. 2. Manufacturing Technology -Vol I- P.N. Rao- TMH			
1	Steps involved in making a casting	19/11/2019	Lecture interspersed with discussions
2	Advantage of casting and its applications.	20/11/2019	
3	Patterns and Pattern making	21/11/2019	
4	Pattern making continued	22/11/2019	
5	Types of patterns	23/11/2019	
6	Types of patterns continued	26/11/2019	
7	Materials used for patterns	27/11/2019	
8	Materials used for patterns continued	28/11/2019	
9	pattern allowances and their construction	30/11/2019	
10	pattern construction continued	3/12/2019	
11	Principles of Gating	04/12/2019	
12	Gating ratio and design of Gating systems	05/12/2019	
UNIT-II Casting techniques and Melting **CO2:** To impart basic knowledge and understanding about the primary manufacturing processes such as casting and Melting. **TB:** 1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn.			

2. Manufacturing Technology -Vol I- P.N. Rao- TMH			
11	Methods of melting	05/12/2019	/
12	Types of furnaces	06/12/2019	
13	Furnaces Continuation	6/12/2019	
14	Solidification of metals	09/12/2019	
15	Solidification of pure metals and alloys	10/12/2019	
16	short & long freezing range alloys	12/12/2019	
17	Risers – Types	13/12/2019	
18	function and design	13/12/2019	
19	Design of Risers	16/12/2019	Lecture interspersed with discussions
20	casting design considerations	17/12/2019	
21	Basic Principles of Centrifugal casting	19/12/2019	
22	Applications of Centrifugal Casting	20/12/2019	
23	Die casting and Investment casting	20/12/2019	

UNIT-III Welding

CO3: To impart basic knowledge and understanding about the primary manufacturing processes joining.

TB:

1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn.
2. Manufacturing Technology -Vol I- P.N. Rao- TMH

24	Classification of welding processes	23/12/2019	Lecture interspersed with discussions
25	types of welded joints and their characteristics	24/12/2019	
26	types of welded joints and their characteristics	26/12/2019	
27	Gas welding	27/12/2020	
28	Different types of flames and uses, Oxy – Acetylene Gas cutting.	27/12/2020	
29	Basic principles of Arc welding	30/12/2020	

30	Submerged arc welding	31/12/2020	
31	Inert Gas welding- TIG.	06/01/2020	
32	Inert Gas welding - MIG welding	07/01/2020	

UNIT-IV Joining and Defects

CO4: To impart basic knowledge and understanding about the joining.

TB:

1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn.
2. Manufacturing Technology -Vol I- P.N. Rao- TMH

33	Resistance welding	09/01/2020	Lecture interspersed with discussions
34	Solid state welding processes- Friction welding	10/01/2020	
35	Friction stir welding, Forge welding	10/01/2020	
36	Explosive welding; Thermit welding,	20/01/2020	
37	Plasma welding, Laser welding,	21/01/2020	
38	electron beam welding,	23/01/2020	
39	Soldering & Brazing	24/01/2019	
40	Soldering & Brazing	24/01/2020	
41	Heat affected zones in welding	27/01/2020	
42	pre & post heating zones	28/01/2020	
43	Weldability of metals	30/01/2020	
44	Welding defects	31/01/2020	
45	causes and remedies	31/01/2020	
46	destructive testing of welds	03/02/2020	
47	non-destructive testing of welds	04/02/2020	
48	Design of welded joints	06/02/2020	

UNIT-V

CO5: To impart knowledge on sheet metal forming and powder metallurgy and their relevance in current manufacturing

TB:

1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn.
2. Manufacturing Technology -Vol I- P.N. Rao- TMH

49	Plastic deformation in metals and alloys,	08/12/2020	Lecture interspersed with discussions
50	Hot working and Cold working,	08/02/2020	
51	Strain hardening and Annealing	10/02/2020	
52	Bulk forming processes	11/02/2020	
53	Forging - Types Forging	13/02/2020	
54	Smith forging, Drop Forging	15/02/2020	
55	Roll forging, Forging hammers, Rotary forging, forging defects	15/02/2020	
56	Rolling – fundamentals, types of rolling mills and products,	17/02/2020	
57	Forces in rolling and power requirements.	18/02/2020	
58	Extrusion and its characteristics. Types of extrusion, Impact extrusion, Hydrostatic extrusion.	20/02/2020	
59	Wire drawing and Tube drawing. Introduction to powder metallurgy –	22/02/2020	
60	compaction and sintering, advantages and applications	22/02/2020	

UNIT-VI Sheet metal forming

CO6: To impart knowledge on sheet metal forming and their relevance in current manufacturing

TB:

1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn.
2. Manufacturing Technology -Vol I- P.N. Rao- TMH

61	Sheet metal forming - Blanking and piercing,	24/02/2020	
62	Forces and power requirement in these operations	25/02/2020	
63	Deep drawing, Stretch forming, Bending,	27/02/2020	

64	Spring back and its remedies, Coining, Spinning,	29/02/2020	Lecture interspersed with discussions
65	Types of presses and press tools. High energy rate forming processes:	29/02/2020	
66	Principles of explosive forming, electromagnetic forming,	02/03/2020	
67	Electro hydraulic forming, rubber pad forming, advantages and limitations.	03/03/2020	
68	Processing of Plastics: Types of Plastics, Properties,	05/03/2020	
69	Applications and their processing methods,	06/03/2020	
70	Blow and Injection moulding	09/03/2020	
71	Revision	12/03/2020	
72	Revision	13/03/2020	
73	Revision	16/03/2020	
73	Revision	17/03/2020	

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TENTATIVE LESSON PLAN: R1622033

PRODUCTION TECHNOLOGY

Course Title: PRODUCTION TECHNOLOGY			
Section:B		**Date:16/11/2019**	
Revision No: 00	**Prepared By: Mr. D ROGNATHA RAO**		**Approved By: HOD**
Tools: Black board, PPTs			

No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
	UNIT-I CASTING **CO1:**To impart basic knowledge and understanding about the primary manufacturing processes. **TB:** 1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn. 2. Manufacturing Technology -Vol I- P.N. Rao- TMH		
1	Steps involved in making a casting	18/11/2019	Lecture interspersed with discussions
2	Advantage of casting and its applications.	19/11/2019	
3	Patterns and Pattern making	21/11/2019	
4	Pattern making continued	22/11/2019	
5	Types of patterns	22/11/2019	
6	Types of patterns continued	25/11/2019	
7	Materials used for patterns	26/11/2019	
8	Materials used for patterns continued	28/11/2019	
9	pattern allowances and their construction	29/11/2019	
10	pattern construction continued	29/11/2019	
11	Principles of Gating	02/12/2019	
12	Gating ratio and design of Gating systems	03/12/2019	
	UNIT-II Casting techniques and Melting **CO2:** To impart basic knowledge and understanding about the primary manufacturing processes such as casting and Melting. **TB:** 1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn.		

2. Manufacturing Technology -Vol I- P.N. Rao- TMH			
11	Methods of melting	06/12/2019	/
12	Types of furnaces	07/12/2019	
13	Furnaces Continuation	10/12/2019	
14	Solidification of metals	11/12/2019	
15	Solidification of pure metals and alloys	13/12/2019	
16	short & long freezing range alloys	14/12/2019	
17	Risers – Types	17/12/2019	
18	function and design	18/12/2019	
19	Design of Risers	19/12/2019	Lecture interspersed with discussions
20	casting design considerations	20/12/2019	
21	Basic Principles of Centrifugal casting	21/12/2019	
22	Applications of Centrifugal Casting	24/12/2019	
23	Die casting and Investment casting	26/12/2019	

UNIT-III Welding

CO3: To impart basic knowledge and understanding about the primary manufacturing processes joining.

TB:

1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn.
2. Manufacturing Technology -Vol I- P.N. Rao- TMH

24	Classification of welding processes	27/12/2019	Lecture interspersed with discussions
25	types of welded joints and their characteristics	28/12/2019	
26	types of welded joints and their characteristics	31/12/2019	
27	Gas welding	02/01/2020	
28	Different types of flames and uses, Oxy – Acetylene Gas cutting.	03/01/2020	
29	Basic principles of Arc welding	04/01/2020	

30	Submerged arc welding	07/01/2020	
31	Inert Gas welding- TIG.	08/01/2020	
32	Inert Gas welding - MIG welding	09/01/2020	

UNIT-IV Joining and Defects

CO4: To impart basic knowledge and understanding about the joining.

TB:

1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn.
2. Manufacturing Technology -Vol I- P.N. Rao- TMH

33	Resistance welding	10/01/2020	Lecture interspersed with discussions
34	Solid state welding processes- Friction welding	21/01/2020	
35	Friction stir welding, Forge welding	22/01/2020	
36	Explosive welding; Thermit welding,	23/01/2020	
37	Plasma welding, Laser welding,	24/01/2020	
38	electron beam welding,	25/01/2020	
39	Soldering & Brazing	28/01/2019	
40	Soldering & Brazing	29/01/2020	
41	Heat affected zones in welding	30/01/2020	
42	pre & post heating zones	31/01/2020	
43	Weldability of metals	01/02/2020	
44	Welding defects	04/02/2020	
45	causes and remedies	05/02/2020	
46	destructive testing of welds	06/02/2020	
47	non-destructive testing of welds	07/02/2020	
48	Design of welded joints	08/02/2020	

UNIT-V

CO5: To impart knowledge on sheet metal forming and powder metallurgy and their relevance in current manufacturing

TB:

1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn.
2. Manufacturing Technology -Vol I- P.N. Rao- TMH

49	Plastic deformation in metals and alloys,	11/12/2020	Lecture interspersed with discussions
50	Hot working and Cold working,	12/02/2020	
51	Strain hardening and Annealing	13/02/2020	
52	Bulk forming processes	14/02/2020	
53	Forging - Types Forging	15/02/2020	
54	Smith forging, Drop Forging	18/02/2020	
55	Roll forging, Forging hammers, Rotary forging, forging defects	19/02/2020	
56	Rolling – fundamentals, types of rolling mills and products,	20/02/2020	
57	Forces in rolling and power requirements.	22/02/2020	
58	Extrusion and its characteristics. Types of extrusion, Impact extrusion, Hydrostatic extrusion.	25/02/2020	
59	Wire drawing and Tube drawing. Introduction to powder metallurgy –	26/02/2020	
60	compaction and sintering, advantages and applications	27/02/2020	

UNIT-VI Sheet metal forming

CO6: To impart knowledge on sheet metal forming and their relevance in current manufacturing

TB:

1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn.
2. Manufacturing Technology -Vol I- P.N. Rao- TMH

61	Sheet metal forming - Blanking and piercing,	28/02/2020	
62	Forces and power requirement in these operations	29/02/2020	
63	Deep drawing, Stretch forming, Bending,	03/03/2020	

64	Spring back and its remedies, Coining, Spinning,	04/03/2020	Lecture interspersed with discussions
65	Types of presses and press tools. High energy rate forming processes:	05/03/2020	
66	Principles of explosive forming, electromagnetic forming,	06/03/2020	
67	Electro hydraulic forming, rubber pad forming, advantages and limitations.	07/03/2020	
68	Processing of Plastics: Types of Plastics, Properties,	11/03/2020	
69	Applications and their processing methods,	12/03/2020	
70	Blow and Injection moulding	13/03/2020	
71	Revision	14/03/2020	
72	Revision	17/03/2020	
73	Revision	18/03/2020	

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TENTATIVE LESSON PLAN: R1622034

Course Title: DESIGN OF MACHINE MEMBERS-I		Course code: R1622034	
Section : Sec I	Date :18/11/2019	Page No : 01 to 03	
Revision No : 00	Prepared By: R. KARUN KUMAR	Approved By : HOD	
Tools: BLACK BOARD, PPTs			

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION			
CO1:Able to Apply the design procedure to engineering problems, and to Calculate different stresses in the machine components subjected to various static loads, failures and suitability of a material for an engineering application.			
TB: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.			
1	General considerations in the design of Engineering Materials	18/11/2019	Lecture interspersed with discussions
2	Mechanical properties ,Manufacturing consideration in design	19/11/2019	
3	Tolerances and fits	20/11/2019	
4	BIS codes of steels.	21/11/2019	
5	Stresses In Machine Members, Simple stresses	22/11/2019	
6	combined stresses —torsional and bending stresses	25/11/2019	
7	Impact stresses — stress strain relation	26/11/2019	
8	various theories of failure	27/11/2019	
9	Factor of safety , design for strength and rigidity	29/11/2019	
10	preferred numbers, the concept of stiffness	30/11/2019	
11	The concept of stiffness in tension, bending	30/11/2019	
12	Static strength design based on fracture toughness	02/12/2019	
13	Problems on theories of failures	03/12/2019	

UNIT-II STRENGTH OF MACHINE ELEMENTS

CO2: Able to select the suitable materials and significance of tolerances and fits in cr design applications and also to Calculate dynamic stresses in the machine compo subjected to variable loads.

TB: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGr Education Private Limited publications.

14	Stress concentration	04/12/2019	Lecture interspersed with discussions
15	theoretical stress concentration factor	06/12/2019	
16	fatigue stress concentration factor notch sensitivity	07/12/2019	
17	design for fluctuating stresses	07/12/2019	
18	endurance limit	09/12/2019	
19	Problems on Stress concentration factor	10/12/2019	
20	Problems on endurance limit	11/12/2019	
21	S-N curve, problems on S-N curve	11/12/2019	
22	Goodman ' s line, problems	13/12/2019	
23	Soderberg's line, problems	16/12/2019	
24	Problems on Goodman ' s line	17/12/2019	
25	Problems on Goodman ' s line	18/12/2019	
UNIT-III Riveted and welded joints **CO3: Able to Design riveted, welded, bolted joints subjected to static loads and their failure modes.** **TB:"DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.**			
26	Riveted and welded joints- design of joins	20/12/2019	Lecture interspersed with discussions
27	eccentric loaded welded joints	23/12/2019	
28	design of joints under eccentric joints	24/12/2019	
29	locking devices both of uniform strength	27/12/2019	
30	different seals	27/12/2019	
31	Problems on riveted joints	30/12/2019	
32	Problems on welded joints	31/12/2020	
33	Problems on bolted joints	06/01/2020	
34	Bolted joints — design of bolts with pre-stresses	06/01/2020	
35	eccentric loaded welded joints	07/01/2020	
UNIT-IV KEYS, COTTERS AND KNUCKLE JOINTS **CO4:Able to Design keys, cotters and knuckle joints subjected to static loads and their failure modes.** **TB:"DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.**			
36	Introduction , Design of keys	27/01/2020	Lecture interspersed with discussions
37	Introduction, stresses in keys	28/01/2020	
38	cotter joints-spigot and socket	29/01/2020	
39	sleeve and cotter, jib and cotter joints	29/01/2020	
40	knuckle joints, problems	31/01/2020	
41	Design of solid and hollow shafts for strength and rigidity	03/02/2020	
42	design of shafts for combined bending and axial	04/02/2020	

	loads		
43	shaft sizes— BIS code	05/02/2020	
44	Use of internal and external circlips	07/02/2020	
45	gaskets and seals, problems	10/02/2020	
46	problems	11/02/2020	
UNIT-V SHAFT COUPLING **CO5:Able to Design the machine shafts and suggest suitable coupling for a given application.** **TB:"DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.**			
47	Rigid couplings	12/02/2020	Lecture interspersed with discussions
48	muff, split muff couplings	14/02/2020	
49	flange couplings	15/02/2020	
50	flexible couplings	17/02/2020	
51	flange couplings (modified)	24/02/2020	
52	Problems on rigid couplings	25/02/2020	
53	Problems on flange couplings	26/02/2020	
54	Problems on flexible couplings	28/02/2020	
UNIT-VIMECHANICAL SPRINGS **CO6:Able to calculate stresses in different types of springs subjected to static loads and dynamic loads.** **TB"DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.**			
55	Stresses and deflections of helical springs	29/02/2020	Lecture interspersed with discussions
56	Extension springs	29/02/2020	
57	compression springs	02/03/2020	
58	springs for fatigue loading	03/03/2020	
59	energy storage capacity	06/03/2020	
60	helical torsion springs	07/03/2020	
61	co-axial springs	10/03/2020	
62	leaf springs	11/03/2020	
63	Problems on springs	13/03/2020	
64	Problems on helical torsion springs	14/03/2020	
65	Problems on leaf springs	16/03/2020	
66	Problems on compression springs	16/03/2020	
67	Problems on springs	17/03/2020	
68	previous paper	18/03/2020	
69	Revision	18/03/2020	
70	Revision	19/03/2020	

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TENTATIVE LESSON PLAN: R1622034

Course Title: DESIGN OF MACHINE MEMBERS-I		Course code: R1622034	
Section : Sec II	Date :18/11/2019	Page No : 01 to 03	
Revision No : 00	Prepared By: R. KARUN KUMAR	Approved By : HOD	
Tools: BLACK BOARD, PPTs			

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION			
CO1:Able to Apply the design procedure to engineering problems, and to Calculate different stresses in the machine components subjected to various static loads, failures and suitability of a material for an engineering application.			
TB: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.			
1	General in the design of Engineering Materials	18/11/2019	Lecture interspersed with discussions
2	Mechanical properties ,Manufacturing consideration in design	19/11/2019	
3	Tolerances and fits	20/11/2019	
4	BIS codes of steels.	21/11/2019	
5	Stresses In Machine Members, Simple stresses	22/11/2019	
6	combined stresses —torsional and bending stresses	25/11/2019	
7	Impact stresses — stress strain relation	26/11/2019	
8	various theories of failure	27/11/2019	
9	Factor of safety , design for strength and rigidity	28/11/2019	
10	preferred numbers, the concept of stiffness	29/11/2019	
11	The concept of stiffness in tension, bending	30/11/2019	
12	Static strength design based on fracture toughness	30/11/2019	
13	Problems on theories of failures	02/12/2019	
UNIT-II STRENGTH OF MACHINE ELEMENTS			
CO2: Able to select the suitable materials and significance of tolerances and fits in critical design applications and also toCalculate dynamic stresses in the machine components subjected to variable loads.			
TB:"DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.			
14	Stress concentration	03/12/2019	Lecture interspersed
15	theoretical stress concentration factor	04/12/2019	
16	fatigue stress concentration factor notch	06/12/2019	

	sensitivity		with discussions
17	design for fluctuating stresses	06/12/2019	
18	endurance limit	07/12/2019	
19	Problems on Stress concentration factor	07/12/2019	
20	Problems on endurance limit	09/12/2019	
21	S-N curve, problems on S-N curve	10/12/2019	
22	Goodman ' s line, problems	13/12/2019	
23	Soderberg's line, problems	16/12/2019	
24	Problems on Goodman ' s line	17/12/2019	
25	Problems on Goodman ' s line	20/12/2019	

UNIT-III Riveted and welded joints

CO3:Able to Design riveted, welded, bolted joints subjected to static loads and their failure modes.

TTB:"DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.

26	Riveted and welded joints- introduction	20/12/2019	Lecture interspersed with discussions
27	Design of joins	23/12/2019	
28	eccentric loaded riveted and welded joints	24/12/2019	
29	Bolted joints- design of bolts with pre-stresses	27/12/2019	
30	eccentric loaded welded joints	27/12/2019	
31	Design of joins under eccentric loads	30/12/2019	
32	Locking devices – both of uniform strength	31/12/2020	
33	Different seals	02/01/2020	
34	Problems on riveted joints	03/01/2020	
35	Problems on welded joints	03/01/2020	
36	Problems on bolted joints	04/01/2020	
37	Problems on eccentric loading	06/01/2020	
38	problems	07/01/2020	

UNIT-IV KEYS, COTTERS AND KNUCKLE JOINTS

CO4:Able to Design keys, cotters and knuckle joints subjected to static loads and their failure modes.

TB:"DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.

39	Introduction , Design of keys	27/01/2020	Lecture interspersed with discussions
40	Introduction, stresses in keys , cotter joints-spigot and socket	28/01/2020	
41	sleeve and cotter, jib and cotter joints	29/01/2020	
42	knuckle joints, problems	31/01/2020	
43	Design of solid and hollow shafts for strength and rigidity	03/02/2020	
44	design of shafts for combined bending and axial	04/02/2020	

	loads		
45	shaft sizes — BIS code	05/02/2020	
46	Use of internal and external circlips	07/02/2020	
47	gaskets and seals, problems	07/02/2020	
48	problems	10/02/2020	
UNIT-V SHAFT COUPLING **CO5:Able to Design the machine shafts and suggest suitable coupling for a given application.** **TB:"DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.**			
49	Rigid couplings	11/02/2020	Lecture interspersed with discussions
50	muff, split muff couplings	14/02/2020	
51	flange couplings	14/02/2020	
52	flexible couplings	15/02/2020	
53	flange couplings (modified)	17/02/2020	
54	Problems on rigid couplings	24/02/2020	
55	Problems on muff, split muff couplings	25/02/2020	
56	Problems on flange couplings	26/02/2020	
57	Problems on flexible couplings	27/02/2020	
UNIT-VIMECHANICAL SPRINGS **CO6:Able to Calculate stresses in different types of springs subjected to static loads and dynamic loads.** **TB:"DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.**			
58	Stresses and deflections of helical springs	28/02/2020	Lecture interspersed with discussions
59	Extension springs	28/02/2020	
60	compression springs	02/03/2020	
61	springs for fatigue loading	03/03/2020	
62	energy storage capacity	06/03/2020	
63	helical torsion springs	06/03/2020	
64	co-axial springs	09/03/2020	
65	leaf springs	10/03/2020	
66	Problems on springs	11/03/2020	
67	Problems on helical torsion springs	13/03/2020	
68	Problems on leaf springs	14/03/2020	
69	Problems on compression springs	16/03/2020	
70	Problems on springs	16/03/2020	
71	previous papers, previous papers	17/03/2020	
72	Revision	17/03/2020	

73	Revision	18/03/2020	
74	Revision	19/03/2020	

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TENTATIVE PLAN: R1622035

Course Title: MACHINE DRAWING		Course code: R1622035
Section: Sec I	Date: 18-11-2019	Page No: 01
Revision No: 00	Prepared By: G.DURGA PRASAD	Approved By: HOD
Tools: BLACK BOARD AND PPTS.		

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I Drawing of Machine Elements and simple parts. **CO1: To provide basic understanding and drawing practice of various joint, simple mechanical parts.** **TB: "Machine Drawing" –K.L.Narayana, P.Kannaiah & K. Venkata Reddy.--**			
	UNIT-I- DRAWING OF MACHINE COMPONENTS		
1	Popular forms of Screw threads	18-112019	
2	Bolts, nuts	20-11-2019	
3	Stud bolts	25-11-2019	
4	Tap bolts	27-11-2019	
5	Set screws	02-12-2019	Lecture interspersed with discussions
6	Keys	04-12-2019	
7	Cotter joints	09-12-2019	
8	Knuckle joint.	11-12-2019	
9	Shaft coupling	16-12-2019	
10	Riveted joints for plates	16-12-2019	
11	Spigot and socket pipe joint.	18-12-2019	
12	Journal	23-12-2019	
13	Pivot and collar	30-12-2019	
14	Footstep bearings	06-01-2019	
UNIT-II ASSEMBLY DRAWINGS **CO2: The student will be able to draw the assembly from the individual part drawing.** **TB: "Machine Drawing" –K.L.Narayana, P.Kannaiah & K. Venkata Reddy.**			
	UNIT-II -ASSEMBLY DRAWINGS		
15	Engine parts –Gear pump	27-01-2020	
16	Fuel pump	29-01-2020	
17	Petrol Engine connecting rod	03-02-2020	
18	Piston assembly	05-02-2020	
19	Other machine parts - Screws jacks	12-02-2020	Lecture interspersed with discussions
20	Machine Vices	17-02-2020	
21	Plummer block	24-02-2020	
22	Tailstock	26-02-2020	
23	Valves: spring loaded safety valve	02-03-2020	
24	Feed check valve	03-03-2020	
25	Air cock	09-03-2020	
26	Control valves	10-03-2020	

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TENTATIVE PLAN: R1622035

Course Title: MACHINE DRAWING		Course code: R1622035
Section: Sec II	Date: 18-11-2019	Page No: 01
Revision No: 00	Prepared By:G.DURGA PRASAD	Approved By: HOD
Tools: BLACK BOARD AND PPTS.		

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I Drawing of Machine Elements and simpleparts. **CO1:To provide basic understanding and drawing practice of various joint, simplemechanical parts.** **TB: "Machine Drawing" –K.L.Narayana, P.Kannaiah& K. Venkata Reddy.**			
	UNIT-I- DRAWING OF MACHINE COMPONENTS		
1	Popular forms of Screw threads	20-11-2019	
2	Bolts, nuts	25-11-2019	
3	Stud bolts	28-11-2019	
4	Tap bolts	03-12-2019	
5	Setscrews	05-12-2019	Lecture interspersed with discussions
6	Keys	10-12-2019	
7	Cotter joints	12-12-2019	
8	Knucklejoint.	17-12-2019	
9	Shaft coupling	19-12-2019	
10	Riveted joints forplates	24-12-2019	
11	Spigot and socket pipe joint.	26-12-2019	
12	Journal	31-12-2019	
13	Pivot and collar	02-01-2020	
14	Footstepbearings	07-01-2020	
UNIT-II ASSEMBLY DRAWINGS **CO2: The student will be able to draw the assembly from the individual part drawing.** **TB: "Machine Drawing" –K.L.Narayana, P.Kannaiah& K. Venkata Reddy.**			
	UNIT-II -ASSEMBLY DRAWINGS		
15	Engine parts –Gear pump	09-01-2020	
16	Fuel pump	28-01-2020	
17	Petrol Engine connecting rod	30-02-2020	
18	Pistonassembly	04-02-2020	
19	Other machine parts - Screws jacks	06-02-2020	Lecture interspersed with discussions
20	Machine Vices	11-02-2020	
21	Plummer block	13-02-2020	
22	Tailstock	18-02-2020	
23	Valves: spring loaded safety valve	25-02-2020	
24	Feed check valve	27-02-2020	
25	Air cock	03-03-2020	
26	Controlvalves	05-03-2020	
27	Machine Vices	10-03-2020	
28	Tailstock	12-03-2020	
29	Revision	17-03-2020	
30	Revision	19-03-2020	

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TENTATIVE LESSON PLAN: R1622036
INDUSTRIAL ENGINEERING AND MANAGEMENT

Course Title: INDUSTRIAL ENGINEERING & MANAGEMENT		
Section : Sec A	**Date : 09/11/2019**	**Page No :** 01 of 05
Revision No : 00	**Prepared By : P. TARUN NAGA VENKATESH**	**Approved By : HOD**

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I	**Introduction**		
CO1: To convey core information and skill sets required in the industrial management and engineering professions, such as the ability to apply basic mathematics, probability, and statistics understanding, as well as domain knowledge of industrial engineering and management.			
TB: Industrial Engineering and Management by O. P. Khanna, Khanna Publishers.			
1	Definition of Industrial Engineering, Development	18-11-2019	Lecture interspersed with discussions
2	Applications, Role of an Industrial Engineer	19-11-2019	
3	Differences Between Production Management And Industrial Engineering	24-11-2019	
4	Quantitative Tools of IE and Productivity Measurement	25-11-2019	
5	Concepts Of Management	30-11-2019	
6	Importance Of Management	30-11-2019	
7	Functions Of Management	02-12-2019	
8	Scientific Management	02-12-2019	
9	Taylor's Principles	03-12-2019	
10	Theory X And Theory Y	04-12-2019	
11	Fayol's Principles Of Management	05-12-2019	
UNIT-II	**Plant Layout**		
CO2: To develop graduates who can design, develop, execute, and innovate integrated systems that incorporate people, materials, information, equipment, and energy using a system approach.			
TB: Industrial Engineering and Management by O. P. Khanna, Khanna Publishers.			
12	Factors Governing Plant Location	07-12-2019	Lecture interspersed with discussions
13	Types Of Production Layouts	07-12-2019	
14	Advantages And Disadvantages of Process Layout And Product Layout	09-12-2019	
15	Applications of Process And Product Layout	11-12-2019	
16	Quantitative Techniques For Optimal Design Of Layouts	12-12-2019	
17	Plant Maintenance, Preventive And Breakdown Maintenance.	16-12-2019	

UNIT-III Opeartions Management

CO3: Students are allowed to understand the interactions in modern society between engineering, business, technology, and the environment.

TB: Industrial Engineering and Management by O. P. Khanna, Khanna Publishers.

18	Importance	18-12-2019	Lecture interspersed with discussions
19	Types Of Production, Applications	20-12-2019	
20	Workstudy, Method Study And Time Study	23-12-2019	
21	Work Sampling	24-12-2019	
22	PMTS, Micro-Motion Study	26-12-2019	
23	Rating Techniques	30-12-2019	
24	MTM, Work Factor System	02-01-2020	
25	Principles Of Ergonomics	04-01-2020	
26	Flow Process Charts	06-01-2020	
27	String Diagrams And Therbligs	07-01-2020	

UNIT-IV Statistical Quality Control

CO4: Use the techniques, skills, and current engineering technologies required for engineering practise while taking into account public health and safety, cultural, socioeconomic, and environmental restrictions.

TB: Industrial Engineering and Management by O. P. Khanna, Khanna Publishers.

28	Quality Control, Its Importance, SQC	09-01-2020	Lecture interspersed with discussions
29	Attribute Sampling Inspection With Single And Double Sampling	10-01-2020	
30	Control Charts – X And R – Chart	27-01-2020	
31	X AND S Charts And Their Applications	29-01-2020	
32	Numerical Examples	30-01-2020	
33	TOTAL QUALITY MANAGEMENT: Zero Defect Concept	31-01-2020	
34	Quality Circles, Implementation, Applications	01-02-2020	
35	ISO Quality Systems. Six Sigma – Definition, Basic Concepts	03-02-2020	

UNIT-V Resource Management

CO5: Students were able to grasp the interactions between engineering, business, technology, and the environment in modern society.

TB: Industrial Engineering and Management by O. P. Khanna, Khanna Publishers.

36	Concept Of Human Resource Management	06-02-2020	Lecture interspersed with discussions
37	Personnel Management And Industrial Relations	10-02-2020	
38	Functions Of Personnel Management	12-02-2020	
39	Job-Evaluation, Its Importance And Types	13-02-2020	
40	Merit Rating	15-02-2020	
41	Quantitative Methods	17-02-2020	
42	Wage Incentive Plans, Types	24-02-2020	

UNIT-VI Value Analysis

CO6: Function effectively within multi – disciplinary teams and understand the fundamental precepts of effective project management.

TB: Industrial Engineering and Management by O. P. Khanna, Khanna Publishers.

43	Value engineering	26-02-2020	Lecture interspersed with discussions
44	implementation procedure	27-02-2020	
45	enterprise resource planning	29-02-2020	
46	supply chain management	02-03-2020	
47	PERT PROJECT MANAGEMENT	04-03-2020	
48	PERT, CPM – differences	05-03-2020	
49	Applications of PERT and CPM	07-03-2020	
50	critical path	09-03-2020	
51	determination of floats	11-03-2020	
52	importance	12-03-2020	
53	project crashing	16-03-2020	
54	smoothing	17-03-2020	
55	numerical examples	18-03-2020	
56	Revision	20-03-2020	

57	Revision	23-03-2020	
58	Revision	24-03-2020	
59	Revision	26-03-2020	
60	Revision	28-03-2020	

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TENTATIVE LESSON PLAN: R1622036
INDUSTRIAL ENGINEERING AND MANAGEMENT

Course Title: INDUSTRIAL ENGINEERING & MANAGEMENT		
Section : Sec B	**Date : 09/11/2019**	**Page No :** 01 of 05
Revision No : 00	**Prepared By : P. TARUN NAGA VENKATESH**	**Approved By : HOD**

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I Introduction			
CO1: To convey core information and skill sets required in the industrial management and engineering professions, such as the ability to apply basic mathematics, probability, and statistics understanding, as well as domain knowledge of industrial engineering and management.			
TB: Industrial Engineering and Management by O. P. Khanna, Khanna Publishers.			
1	Definition of Industrial Engineering, Development	18-11-2019	Lecture interspersed with discussions
2	Applications, Role of an Industrial Engineer	19-11-2019	
3	Differences Between Production Management And Industrial Engineering	23-11-2019	
4	Quantitative Tools of IE and Productivity Measurement	25-11-2019	
5	Concepts Of Management	26-11-2019	
6	Importance Of Management	27-11-2019	
7	Functions Of Management	29-11-2019	
8	Scientific Management	02-12-2019	
9	Taylor's Principles	03-12-2019	
10	Theory X And Theory Y	04-12-2019	
11	Fayol's Principles Of Management	07-12-2019	
UNIT-II Plant Layout			
CO2: To develop graduates who can design, develop, execute, and innovate integrated systems that incorporate people, materials, information, equipment, and energy using a system approach.			
TB: Industrial Engineering and Management by O. P. Khanna, Khanna Publishers.			
12	Factors Governing Plant Location	10-12-2019	Lecture interspersed with discussions
13	Types Of Production Layouts	11-12-2019	
14	Advantages And Disadvantages of Process Layout And Product Layout	11-12-2019	
15	Applications of Process And Product Layout	13-12-2019	
16	Quantitative Techniques For Optimal Design Of Layouts	17-12-2019	
17	Plant Maintenance, Preventive And Breakdown Maintenance.	18-12-2019	

UNIT-III Opeartions Management

CO3: Students are allowed to understand the interactions in modern society between engineering, business, technology, and the environment.

TB: Industrial Engineering and Management by O. P. Khanna, Khanna Publishers.

18	Importance	20-12-2019	Lecture interspersed with discussions
19	Types Of Production, Applications	20-12-2019	
20	Workstudy, Method Study And Time Study	23-12-2019	
21	Work Sampling	27-12-2019	
22	PMTS, Micro-Motion Study	27-12-2019	
23	Rating Techniques	30-12-2019	
24	MTM, Work Factor System	30-12-2020	
25	Principles Of Ergonomics	03-01-2020	
26	Flow Process Charts	03-01-2020	
27	String Diagrams And Therbligs	04-01-2020	

UNIT-IV Statistical Quality Control

CO4: Use the techniques, skills, and current engineering technologies required for engineering practise while taking into account public health and safety, cultural, socioeconomic, and environmental restrictions.

TB: Industrial Engineering and Management by O. P. Khanna, Khanna Publishers.

28	Quality Control, Its Importance, SQC	06-01-2020	Lecture interspersed with discussions
29	Attribute Sampling Inspection With Single And Double Sampling	10-01-2020	
30	Control Charts – X And R – Chart	27-01-2020	
31	X AND S Charts And Their Applications	29-01-2020	
32	Numerical Examples	30-01-2020	
33	TOTAL QUALITY MANAGEMENT: Zero Defect Concept	31-01-2020	
34	Quality Circles, Implementation, Applications	01-02-2020	
35	ISO Quality Systems. Six Sigma – Definition, Basic Concepts	03-02-2020	

UNIT-V Resource Management

CO5: Students were able to grasp the interactions between engineering, business, technology, and the environment in modern society.

TB: Industrial Engineering and Management by O. P. Khanna, Khanna Publishers.

36	Concept Of Human Resource Management	07-02-2020	Lecture interspersed with discussions
37	Personnel Management And Industrial Relations	07-02-2020	
38	Functions Of Personnel Management	10-02-2020	
39	Job-Evaluation, Its Importance And Types	12-02-2020	
40	Merit Rating	12-02-2020	
41	Quantitative Methods	14-02-2020	
42	Wage Incentive Plans	14-02-2020	
43	Types of Wage Incentive Plans	15-02-2020	

UNIT-VI Value Analysis

CO6: Function effectively within multi – disciplinary teams and understand the fundamental precepts of effective project management.

TB: Industrial Engineering and Management by O. P. Khanna, Khanna Publishers.

44	Value engineering	17-02-2020	Lecture interspersed with discussions
45	implementation procedure	24-02-2020	
46	enterprise resource planning	24-02-2020	
47	supply chain management	28-02-2020	
48	PERT PROJECT MANAGEMENT	28-02-2020	
49	PERT, CPM – differences	02-03-2020	
50	Applications of PERT and CPM	04-03-2020	
51	PERT, CPM Numericals	06-03-2020	
52	critical path	06-03-2020	
53	determination of floats	07-03-2020	
54	importance	09-03-2020	
55	project crashing	11-03-2020	
56	smoothing	11-03-2020	

57	numerical examples	13-03-2020	
58	Revision	17-03-2020	
59	Revision	19-03-2020	
60	Revision	21-03-2020	
61	Revision	24-03-2020	
62	Revision	26-03-2020	

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TENTATIVE LESSON PLAN: R1632031
METROLOGY

Course Title: Metrology		
Section : Sec II	Date : 18/11/19	Page No : 01 of 04
Revision No : 00	Prepared By :V.Pavan Kumar	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I Systems Of Limits And Fits **CO1: Design of part, tolerances and fits.** **TB: Engineering Metrology by R.K.Jain / Khanna Publishers**			
1	Introduction, nominal size, tolerance	19-11-19	Lecture interspersed with discussions
2	limits, deviations.	19-11-19	
3	Unilateral and bilateral tolerance system, fits	20-11-19	
4	hole and shaft basis systems	22-11-19	
5	interchangeability, determistic & statistical tolerancing, selective assembly	25-11-19	
6	International standard system of tolerances,	26-11-19	
7	selection of limits and tolerances for correct functioning.	28-11-19	
8	Problems on limits and tolerances	29-11-19	
9	Length standards, end standards	2-12-19	
10	slip gauges- calibration of the slip gauges	4-12-19	
11	dial indicators	6-12-19	
12	micrometers.	10-12-19	
13	Measurement of angles by bevel protractor, angle slip gauges	12-12-19	
14	Angle dekkor, Sine bar, Sine table	16-12-19	

15	Rollers and spheres used to measure angles and Tapers.	18-12-19	
16	Taylor's principle	20-12-19	Lecture interspersed with discussions
17	design of go and no go gauges; plug, ring gagues	23-12-19	
18	snap, gap, taper gagues	25-12-19	
19	profile and position gauges.	26-12-19	
UNIT-III Optical Measuring Instruments; Interferometry **CO3: Principles of measuring instruments** **TB: Engineering Metrology by R.K.Jain / Khanna Publishers**			
20	Tools maker's microscope and uses	27/12/19	
21	autocollimators, optical projector	30/12/19	
22	optical flats and their uses.	3/1/20	Lecture interspersed with discussions
23	Interference of light,Michaleson's interferometer	5/1/20	
24	NPL flatness interferometer and NPL gauge interferometer.	7/1/20	
UNIT-IV Surface Roughness Measurement; Comparators **CO4: Evaluation and inspection of surface roughness.** **TB: Engineering Metrology by R.K.Jain / Khanna Publishers**			
25	Differences between surface roughness and surface waviness	28/1/20	
26	Nomenclature of surface roughness	29/1/20	Lecture interspersed with discussions
27	Numerical assessment of surface finish-CLA, Rt., R.M.S. Rz, R10 values	30/1/20	
28	Method of measurement of surface finish – Profilograph, Talysurf	31/1/20	

29	ISI symbols for indication of surface finish.	3/2/20	Lecture interspersed with discussions
30	Numerical problems on surface finish	4/2/20	
31	Mechanical comparators	5/2/20	
32	optical comparators	6/2/20	
33	electrical and electronic, comparators	7/2/20	
34	Pneumatic comparators and their uses.	10/2/20	
UNIT-V Gear Measurement; Screw Thread Measurement **CO5: Inspection of spur gear and thread elements** **TB: Engineering Metrology by R.K.Jain / Khanna Publishers**			
35	Nomenclature of gear tooth	11/2/20	Lecture interspersed with discussions
36	tooth thickness measurement with gear tooth vernier & flange micro meter	12/2/20	
37	pitch measurement	14/2/20	
38	total composite error and tooth to tooth composite errors	18/2/20	
39	rolling gear tester, involute profile checking	19/2/20	
40	Screw thread elements of measurement	21/2/20	
41	concept of virtual effective diameter	25/2/20	
42	measurement of effective diameter	26/2/20	
43	angle of thread and thread pitch	27/2/20	
44	Profile thread gauges.	28/2/20	
UNIT-VI Flatness Measurement; Machine Tool Alignment Tests **CO6: Machine tool testing to evaluate machine tool quality.** **TB: Engineering Metrology by R.K.Jain / Khanna Publishers**			
45	Measurement of flatness of surfaces- instruments used- straight edges	2/3/20	

46	surface plate	4/3/20	Lecture interspersed with discussions
47	auto collimator.	9/3/20	
48	machine tool alignment testing on lathe machine.	13/3/20	
49	machine tool alignment testing on drilling machine.	16/3/20	
50	Machine tool alignment testing on milling machine.	18/3/20	

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TENTATIVE LESSON PLAN: R1632031
METROLOGY

Course Title: Metrology		
Section : Sec I	Date : 18/11/19	Page No : 01 of 04
Revision No : 00	Prepared By :V.Pavan Kumar	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I Systems Of Limits And Fits **CO1: Design of part, tolerances and fits.** **TB: Engineering Metrology by R.K.Jain / Khanna Publishers**			
1	Introduction, nominal size, tolerance	18-11-19	Lecture interspersed with discussions
2	limits, deviations.	19-11-19	
3	Unilateral and bilateral tolerance system, fits	21-11-19	
4	hole and shaft basis systems	23-11-19	
5	interchangeability, determistic & statistical tolerancing, selective assembly	26-11-19	
6	International standard system of tolerances,	29-11-19	
7	selection of limits and tolerances for correct functioning.	4-12-19	
8	Problems on limits and tolerances	5-12-19	
9	Length standards, end standards	6-12-19	
10	slip gauges- calibration of the slip gauges	9-12-19	
11	dial indicators	11-12-19	
12	micrometers.	13-12-19	
13	Measurement of angles by bevel protractor, angle slip gauges	16-12-19	
14	Angle dekkor, Sine bar, Sine table	18-12-19	

			Lecture interspersed with discussions
15	Rollers and spheres used to measure angles and Tapers.	20-12-19	
16	Taylor's principle	23-12-19	
17	design of go and no go gauges; plug, ring gagues	24-12-19	
18	snap, gap, taper gagues	25-12-19	
19	profile and position gauges.	26-12-19	
UNIT-III Optical Measuring Instruments; Interferometry **CO3: Principles of measuring instruments** **TB: Engineering Metrology by R.K.Jain / Khanna Publishers**			
20	Tools maker's microscope and uses	27/12/19	Lecture interspersed with discussions
21	autocollimators, optical projector	30/12/19	
22	optical flats and their uses.	2/1/20	
23	Interference of light,Michaleson's interferometer	5/1/20	
24	NPL flatness interferometer and NPL gauge interferometer.	7/1/20	
UNIT-IV Surface Roughness Measurement; Comparators **CO4: Evaluation and inspection of surface roughness.** **TB: Engineering Metrology by R.K.Jain / Khanna Publishers**			
25	Differences between surface roughness and surface waviness	27/1/20	Lecture interspersed with discussions
26	Nomenclature of surface roughness	28/1/20	
27	Numerical assessment of surface finish-CLA, Rt., R.M.S. Rz, R10 values	29/1/20	
28	Method of measurement of surface finish – Profilograph, Talysurf	30/1/20	

29	ISI symbols for indication of surface finish.	31/1/20	Lecture interspersed with discussions
30	Numerical problems on surface finish	3/2/20	
31	Mechanical comparators	4/2/20	
32	optical comparators	5/2/20	
33	electrical and electronic, comparators	6/2/20	
34	Pneumatic comparators and their uses.	10/2/20	
UNIT-V Gear Measurement; Screw Thread Measurement **CO5: Inspection of spur gear and thread elements** **TB: Engineering Metrology by R.K.Jain / Khanna Publishers**			
35	Nomenclature of gear tooth	11/2/20	Lecture interspersed with discussions
36	tooth thickness measurement with gear tooth vernier & flange micro meter	13/2/20	
37	pitch measurement	14/2/20	
38	total composite error and tooth to tooth composite errors	17/2/20	
39	rolling gear tester, involute profile checking	18/2/20	
40	Screw thread elements of measurement	20/2/20	
41	concept of virtual effective diameter	22/2/20	
42	measurement of effective diameter	25/2/20	
43	angle of thread and thread pitch	26/2/20	
44	Profile thread gauges.	28/2/20	
UNIT-VI Flatness Measurement; Machine Tool Alignment Tests **CO6: Machine tool testing to evaluate machine tool quality.** **TB: Engineering Metrology by R.K.Jain / Khanna Publishers**			
45	Measurement of flatness of surfaces- instruments used- straight edges	2/3/20	

46	surface plate	5/3/20	Lecture interspersed with discussions
47	auto collimator.	9/3/20	
48	machine tool alignment testing on lathe machine.	12/3/20	
49	machine tool alignment testing on drilling machine.	16/3/20	
50	machine tool alignment testing on milling machine.	18/3/20	

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TENTATIVE LESSON PLAN: R1632032

INSTRUMENTATION & CONTROL SYSTEMS

Course Title: INSTRUMENTATION AND CONTROL SYSTEMS			
Section: A		**Date:30/11/2019**	
Revision No: 00	**Prepared By: Mr. M Hari Krishna**		**Approved By: HOD**
Tools: Black board, PPTs			

No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
	UNIT-I Basics of instrumentation and Displacement Measurement **CO1:** At the end of the course student will understand the principles of Measurement which includes the working Mechanisms of various Devices and sensors. **TB:** **1.** Measurement systems: applications & design by D S Kumar 2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson		
1	Introduction to the course	18/11/2019	Lecture interspersed with discussions
2	Basic Definitions and Principles	18/11/2019	
3	Measurement Systems and functional Elements	19/11/2019	
4	Examples of Generalized Measurement System	20/11/2019	
5	Static Performance Characteristics	21/11/2019	
6	Dynamic Performance Characteristics	25/11/2019	
7	Introduction to pressure measurement	25/11/2019	
8	Classification to transducers	26/11/2019	
9	Transducers Continuation	27/11/2019	
10	Transducers Continuation	28/11/2019	
11	Calibration process	02/12/2019	
12	Errors, classification of errors	02/12/2019	
	UNIT-II Measurement of Temperature and Pressure **CO2:** At the end of this course student will understand the working principles and can select appropriate device for temperature and pressure measurement. **TB:** **1.** Measurement systems: applications & design by D S Kumar		

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson			
11	Introduction to measurement of temperature	03/12/2019	Lecture interspersed with discussions
12	Various Principles of Temperature measurement	04/12/2019	
13	Glass Thermometers, Pressure gauge thermometer, Bimetallic strip thermometer	05/12/2019	
14	Classification based on electrical resistance thermometer	09/12/2019	
15	Electrical resistance thermometer continuation	09/12/2019	
16	Classification Based on radiation thermometer	10/12/2019	
17	Radiation Thermometer continuation	11/12/2019	
18	Sources of errors, precautions in temperature measurement	12/12/2019	
19	Introduction to pressure measurement and units	16/12/2019	
20	Classification of pressure measurement	16/12/2019	
21	Simple Manometers, Piezo meters	17/12/2019	
22	U-Tube Manometers	18/12/2019	
23	Differential Manometers	18/12/2019	
24	Bordon Gauge, Diaphragm gauge,	19/12/2019	
25	Bellow Gauges, Vacuum Gauge	23/12/2019	
26	Ionization Gauge, Dead Weight Pressure Gauge	23/12/2019	
27	Errors in pressure gauges, precautions in reading	24/12/2019	
28	Brief Explanation of all the pressure gauges	26/12/2019	

UNIT-III Miscellaneous Measurement

CO3: At the end of this course student will understand the working principles, and can select appropriate device for of various flow, level, speed, Acceleration and vibration measurement.

TB:

1. Measurement systems: applications & design by D S Kumar

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

29	Introduction to the level Measurement	30/12/2019	Lecture interspersed with discussions
30	Direct Method for Level Measurement	30/12/2019	
31	Indirect Method for Level Measurement	31/12/2019	
32	Flow Measurement	02/01/2020	
33	Flow Measurement and Introduction to Speed Measurement.	06/01/2020	
34	Speed Measurement	06/01/2020	
35	Speed Measurement Continuation	07/01/2020	
36	Measurement of Acceleration	27/01/2020	
37	Measurement of Acceleration	29/01/2020	
38	Measurement of Vibration	29/01/2020	
39	Measurement of Vibration	28/01/2020	
40	Measurement of Force	03/02/2020	
41	Measurement of Force	03/02/2020	

UNIT-IV Strain Measurement

CO4: At the end of this course student will understand the working principles and can select appropriate device of various types of stress and strain measurements.

TB:

1. Measurement systems: applications & design by D S Kumar

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

42	Introduction to Stress and Strain, Load Cells	04/02/2020	Lecture interspersed with discussions
43	Strain Gauge Load Cells	05/02/2020	
44	Pneumatic Load Cells	06/02/2020	
45	Measurement of Force	10/02/2020	
46	Load Cells Continuation	10/02/2020	
47	Load Cells Continuation	11/02/2020	
48	Load Cells Continuation	12/02/2020	

UNIT-V Measurement of Power and Torque

CO5: At the end of this course student will understand the operation principles, and can select appropriate device of various humidity, force, torque and power measurement.

TB:

1. Measurement systems: applications & design by D S Kumar

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

49	Torque Measurement	13/02/2020	Lecture interspersed with discussions
50	Torque Measurement Continuation	14/02/2020	
51	Torque Measurement Continuation	17/02/2020	
52	Torsion Measurement	17/02/2020	
53	Torsion Measurement Continuation	24/02/2020	
54	Torsion Measurement Continuation	25/02/2020	
55	Torsion Measurement Continuation	26/02/2020	
56	Power Measurement	28/02/2020	
57	Power Measurement Continuation	02/03/2020	
58	Dynamometers	03/03/2020	
59	Dynamometers Continuation	04/03/2020	
60	Dynamometers Continuation	04/03/2020	

UNIT-VI Control Systems

CO6: At the end of this course student will understand the concept and can select appropriate control Systems.

TB:

1. Measurement systems: applications & design by D S Kumar

Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

61	Introduction to Control Systems & Definition	05/03/2020	
62	Elements of Control Systems	09/03/2020	
63	Open loop control Systems	09/03/2020	

64	Open loop Control System examples	10/03/2020	Lecture interspersed with discussions
65	Closed loop Control System & examples	11/03/2020	
66	Servo mechanism	12/03/2020	
67	Block Diagrams	13/03/2020	
68	Block Diagram	16/03/2020	
69	Revision	17/03/2020	
70	Revision	18/03/2020	
71	Revision	19/03/2020	

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TENTATIVE LESSON PLAN: R1632032

INSTRUMENTATION & CONTROL SYSTEMS

Course Title: INSTRUMENTATION AND CONTROL SYSTEMS			
Section: B		**Date:30/11/2019**	
Revision No: 00	**Prepared By: Mr. M Hari Krishna**		**Approved By: HOD**
Tools: Black board, PPTs			

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I Basics of instrumentation and Displacement Measurement **CO1:** At the end of the course student will understand the principles of Measurement which includes the working Mechanisms of various Devices and sensors. **TB:** **1.** Measurement systems: applications & design by D S Kumar 2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson			
1	Introduction to the course	19/11/2019	Lecture interspersed with discussions
2	Basic Definitions and Principles	20/11/2019	
3	Measurement Systems and functional Elements	21/11/2019	
4	Examples of Generalized Measurement System	22/11/2019	
5	Static Performance Characteristics	23/11/2019	
6	Dynamic Performance Characteristics	26/11/2019	
7	Introduction to pressure measurement	27/11/2019	
8	Classification to transducers	28/11/2019	
9	Transducers Continuation	29/11/2019	
10	Transducers Continuation	30/11/2019	
11	Calibration process	03/12/2019	
12	Errors, classification of errors	04/12/2019	
UNIT-II Measurement of Temperature and Pressure **CO2:** At the end of this course student will understand the working principles and can select appropriate device for temperature and pressure measurement. **TB:** **1.** Measurement systems: applications & design by D S Kumar			

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson			
11	Introduction to measurement of temperature	05/12/2019	Lecture interspersed with discussions
12	Various Principles of Temperature measurement	06/12/2019	
13	Glass Thermometers, Pressure gauge thermometer, Bimetallic strip thermometer	07/12/2019	
14	Classification based on electrical resistance thermometer	10/12/2019	
15	Electrical resistance thermometer continuation	11/12/2019	
16	Classification Based on radiation thermometer	12/12/2019	
17	Radiation Thermometer continuation	13/12/2019	
18	Sources of errors, precautions in temperature measurement	14/12/2019	
19	Introduction to pressure measurement and units	17/12/2019	
20	Classification of pressure measurement	18/12/2019	
21	Simple Manometers, Piezo meters	19/12/2019	
22	U-Tube Manometers	20/12/2019	
23	Differential Manometers	21/12/2019	
24	Bordon Gauge, Diaphragm gauge,	24/12/2019	
25	Bellow Gauges, Vacuum Gauge	26/12/2019	
26	Ionization Gauge, Dead Weight Pressure Gauge	27/12/2019	
27	Errors in pressure gauges, precautions in reading	28/12/2019	
28	Brief Explanation of all the pressure gauges	31/12/2019	

UNIT-III Miscellaneous Measurement

CO3: At the end of this course student will understand the working principles, and can select appropriate device for of various flow, level, speed, Acceleration and vibration measurement.

TB:

1. Measurement systems: applications & design by D S Kumar

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

29	Introduction to the level Measurement	02/01/2020	Lecture interspersed with discussions
30	Direct Method for Level Measurement	03/01/2020	
31	Indirect Method for Level Measurement	04/01/2020	
32	Flow Measurement	07/01/2020	
33	Flow Measurement and Introduction to Speed Measurement.	08/01/2020	
34	Speed Measurement	09/01/2020	
35	Speed Measurement Continuation	10/01/2020	
36	Measurement of Acceleration	11/01/2020	
37	Measurement of Acceleration	28/01/2020	
38	Measurement of Vibration	29/01/2020	
39	Measurement of Vibration	28/01/2020	
40	Measurement of Force	30/01/2020	
41	Measurement of Force	31/01/2020	

UNIT-IV Strain Measurement

CO4: At the end of this course student will understand the working principles and can select appropriate device of various types of stress and strain measurements.

TB:

1. Measurement systems: applications & design by D S Kumar

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

42	Introduction to Stress and Strain, Load Cells	01/02/2020	Lecture interspersed with discussions
43	Strain Gauge Load Cells	04/02/2020	
44	Pneumatic Load Cells	05/02/2020	
45	Measurement of Force	06/02/2020	
46	Load Cells Continuation	07/02/2020	
47	Load Cells Continuation	08/02/2020	
48	Load Cells Continuation	11/02/2020	

UNIT-V Measurement of Power and Torque

CO5: At the end of this course student will understand the operation principles, and can select appropriate device of various humidity, force, torque and power measurement.

TB:

1. Measurement systems: applications & design by D S Kumar

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

49	Torque Measurement	12/02/2020	Lecture interspersed with discussions
50	Torque Measurement Continuation	13/02/2020	
51	Torque Measurement Continuation	14/02/2020	
52	Torsion Measurement	15/02/2020	
53	Torsion Measurement Continuation	19/02/2020	
54	Torsion Measurement Continuation	20/02/2020	
55	Torsion Measurement Continuation	21/02/2020	
56	Power Measurement	22/02/2020	
57	Power Measurement Continuation	25/03/2020	
58	Dynamometers	26/03/2020	
59	Dynamometers Continuation	27/03/2020	
60	Dynamometers Continuation	28/03/2020	

UNIT-VI Control Systems

CO6: At the end of this course student will understand the concept and can select appropriate control Systems.

TB:

1. Measurement systems: applications & design by D S Kumar

Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

61	Introduction to Control Systems & Definition	29/02//2020	
62	Elements of Control Systems	03/03/2020	
63	Open loop control Systems	04/03/2020	

64	Open loop Control System examples	05/03/2020	Lecture interspersed with discussions
65	Closed loop Control System & examples	06/03/2020	
66	Servo mechanism	07/03/2020	
67	Block Diagrams	11/03/2020	
68	Block Diagram	12/03/2020	
69	Revision	13/03/2020	
70	Revision	17/03/2020	
71	Revision	18/03/2020	

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TENTATIVE PLAN: R1632033

Course Title: REFRIGERATION AND AIRCONDITIONING		Course code: R1632033	
Section : Sec I	Date : 18-11-2019	Page No : 01 to 03	
Revision No : 00	Prepared By : A PRAVEEN KUMAR REDDY	Approved By : HOD	
Tools: BLACK BOARD			

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION TO REFRIGERATION SYSTEM **CO1: Become familiar with a basic concept refrigeration** **TB: "REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI.**			
	UNIT – 1 INTRODUCTION TO REFRIGERATION SYSTEM		Lecture interspersed with discussions
1	Necessity and applications	18/11/2019	
2	Necessity and applications	19/11/2019	
3	Necessity and applications	20/11/2019	
4	Fourier rate equation	21/11/2019	
5	Unit of refrigeration and C.O.P.	21/11/2019	
6	Unit of refrigeration and C.O.P.	23/11/2019	
7	Cop-Mechanical refrigeration	25/11/2019	
8	Cop-Mechanical refrigeration	27/11/2019	
9	Types of ideal cycles of refrigeration	28/11/2019	
10	Types of ideal cycles of refrigeration	28/11/2019	
11	Air refrigetor with reverse Carnot cycle	30/11/2019	
12	Air refrigeration: bell Coleman cycle	02/12/2019	
13	Air refrigeration: bell Coleman cycle	03/12/2019	
14	open and dense air systems	04/12/2019	
15	Refrigeration systems used in air crafts and problems.	05/12/2019	
16	Refrigeration systems used in air crafts and problems.	05/12/2019	
UNIT-II VAPOUR COMPRESSION REFRIGERATION SYSTEM **CO2: Gain knowledge about VCR System** **TB:" REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI.**			
	UNIT – 2 VAPOUR COMPRESSION REFRIGERATION SYSTEM		Lecture interspersed with discussions
17	Working principle of VCR System	05/12/2019	
18	Essential components of the plant	07/12/2019	
19	Essential components of the plant	09/12/2019	
20	Simple vapour compression refrigeration cycle	10/12/2019	
21	COP –representation of cycle on T-S and p-h charts	11/12/2019	
22	COP –representation of cycle on T-S and p-h charts	12/12/2019	
23	COP –representation of cycle on T-S and p-h charts	12/12/2019	
24	COP –representation of cycle on T-S and p-h charts of all VCR systems	12/12/2019	
25	Cycle analysis – actual cycle influence of various parameters on system performance – use of p-h charts	16/12/2019	

26	Problems	17/12/2019	
27	Problems	18/12/2019	
28	Problems	18/12/2019	
UNIT-III REFRIGERANTS AND COMPONENTS OF VCR SYSTEM **CO3: Become familiar with the concepts of refrigerants and components of VCR system** **TB:" REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI.**			
	UNIT – 3 REFRIGERANTS AND COMPONENTS OF VCR SYSTEM		
29	Refrigerants introduction Desirable properties	19/12/2019	Lecture interspersed with discussions
30	Refrigerants introduction Desirable properties	23/12/2019	
31	Classification - refrigerants used	24/12/2019	
32	Nomenclature – ozone depletion – global warming	26/12/2019	
33	Nomenclature,problems	26/12/2019	
34	Compressors – general classification	30/12/2019	
35	Comparison – advantages and disadvantages	31/12/2019	
36	Condensers – classification – working principles evaporators	02/01/2020	
37	Evaporators,problems	04/01/2020	
38	Evaporators,problems	06/01/2020	
UNIT-IV VAPOUR ABSORPTION REFRIGERATION SYSTEM **CO4: Gain knowledge about concept of vapour absorption refrigeration system** **TB:" REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI.**			
	UNIT – 4 VAPOUR ABSORPTION REFRIGERATION SYSTEM		
39	Calculation of maximum COP	07/01/2020	Lecture interspersed with discussions
40	Calculation of maximum COP	09/01/2020	
41	Description and working of NH3 – water system	10/01/2020	
42	Description and working of NH3 – water system	27/01/2020	
43	Li Br –water (Two shell & Four shell) System	29/01/2020	
44	Li Br –water (Two shell & Four shell) System	30/01/2020	
45	Principle of operation three fluid absorption system, salient features	30/01/2020	
46	Principle of operation three fluid absorption system, salient features	31/01/2020	
47	STEAM JET REFRIGERATION SYSTEM	03/02/2020	
48	STEAM JET REFRIGERATION SYSTEM	04/02/2020	
49	Working Principle and basic components. principle	05/02/2020	
50	Operation of (i) thermo electric refrigerator (ii) vortex tube	06/02/2020	
51	Operation of (i) thermo electric refrigerator (ii) vortex tube	07/02/2020	
UNIT-V INTRODUCTION TO AIR CONDITIONING SYSTEM **CO5: Become familiar with Air conditioning system** **TB:" REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI.**			
	UNIT – 5 INTRODUCTION TO AIR CONDITIONING SYSTEM		
52	Psychometric properties & processes	07/02/2020	Lecture interspersed with discussions
53	Characterization of sensible and latent heat loads	10/02/2020	
54	Need for ventilation, consideration of infiltration	11/02/2020	
55	Load concepts of RSHF, GSHF- problems	12/02/2020	
56	Concept of ESHF and ADP temperature	13/02/2020	
57	Requirements of human comfort and concept of effective temperature	14/02/2020	
58	comfort chart –comfort air conditioning	14/02/2020	

59	requirements of industrial air conditioning, air conditioning load calculations.	17/02/2020	
60	Problems	24/02/2020	
61	Problems	25/02/2020	

UNIT-VI AIR CONDITIONING SYSTEM

CO6: Become familiar with concepts of Air conditioning system

TB: "REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI.

	UNIT – 6 AIR CONDITIONING SYSTEM		
62	Classification of equipment	26/02/2020	Lecture interspersed with discussions
63	Classification of equipment	27/02/2020	
64	Cooling, heating humidification	28/02/2020	
65	Dehumidification, filters, grills	28/02/2020	
66	Dehumidification, filters, grills	02/03/2020	
67	Dehumidification, filters, grills	03/03/2020	
68	Registers, fans and blowers	04/03/2020	
69	Registers, fans and blowers	05/03/2020	
70	Heat pump – heat sources	06/03/2020	
71	Different heat pump circuits.	06/03/2020	
72	Revision	09/03/2020	

A. Praveen Kumar Reddy

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TENTATIVE PLAN: R1632033

Course Title: REFRIGERATION AND AIRCONDITIONING		Course code: R1632033	
Section : Sec II	Date : 18-11-2019	Page No : 01 to 03	
Revision No : 00	Prepared By : A PRAVEEN KUMAR REDDY	Approved By : HOD	
Tools: BLACK BOARD			

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION TO REFRIGERATION SYSTEM **CO1: Become familiar with a basic concept refrigeration** **TB: "REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI.**			
	UNIT – 1 INTRODUCTION TO REFRIGERATION SYSTEM		Lecture interspersed with discussions
1	Necessity and applications	19/11/2019	
2	Necessity and applications	20/11/2019	
3	Necessity and applications	20/11/2019	
4	Fourier rate equation	21/11/2019	
5	Unit of refrigeration and C.O.P.	22/11/2019	
6	Unit of refrigeration and C.O.P.	23/11/2019	
7	Cop-Mechanical refrigeration	26/11/2019	
8	Cop-Mechanical refrigeration	27/11/2019	
9	Types of ideal cycles of refrigeration	27/11/2019	
10	Types of ideal cycles of refrigeration	28/11/2019	
11	Air refrigetor with reverse Carnot cycle	29/11/2019	
12	Air refrigeration: bell Coleman cycle	30/11/2019	
13	Air refrigeration: bell Coleman cycle	03/12/2019	
14	open and dense air systems	04/12/2019	
15	Refrigeration systems used in air crafts and problems.	04/12/2019	
16	Refrigeration systems used in air crafts and problems.	04/12/2019	
UNIT-II VAPOUR COMPRESSION REFRIGERATION SYSTEM **CO2: Gain knowledge about VCR System** **TB:" REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI.**			
	UNIT – 2 VAPOUR COMPRESSION REFRIGERATION SYSTEM		Lecture interspersed with discussions
17	Working principle of VCR System	05/12/2019	
18	Essential components of the plant	06/12/2019	
19	Essential components of the plant	07/12/2019	
20	Simple vapour compression refrigeration cycle	10/12/2019	
21	COP –representation of cycle on T-S and p-h charts	11/12/2019	
22	COP –representation of cycle on T-S and p-h charts	12/12/2019	
23	COP –representation of cycle on T-S and p-h charts	13/12/2019	
24	COP –representation of cycle on T-S and p-h charts of all VCR systems	16/12/2019	
25	Cycle analysis – actual cycle influence of various parameters on system performance – use of p-h charts	17/12/2019	

26	Problems	18/12/2019	
27	Problems	18/12/2019	
28	Problems	18/12/2019	
UNIT-III	**REFRIGERANTS AND COMPONENTS OF VCR SYSTEM**		
CO3: Become familiar with the concepts of refrigerants and components of VCR system			
TB:" REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI.			
	UNIT – 3 REFRIGERANTS AND COMPONENTS OF VCR SYSTEM		
29	Refrigerants introduction Desirable properties	19/12/2019	
30	Refrigerants introduction Desirable properties	20/12/2019	Lecture interspersed with discussions
31	Classification - refrigerants used	24/12/2019	
32	Nomenclature – ozone depletion – global warming	26/12/2019	
33	Nomenclature,problems	31/12/2019	
34	Compressors – general classification	02/01/2020	
35	Comparison – advantages and disadvantages	03/01/2020	
36	Condensers – classification – working principles evaporators	04/01/2020	
37	Evaporators,problems	07/01/2020	
38	Evaporators,problems	09/01/2020	
UNIT-IV	**VAPOUR ABSORPTION REFRIGERATION SYSTEM**		
CO4: Gain knowledge about concept of vapour absorption refrigeration system			
TB:" REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI.			
	UNIT – 4 VAPOUR ABSORPTION REFRIGERATION SYSTEM		
39	Calculation of maximum COP	07/01/2020	
40	Calculation of maximum COP	09/01/2020	
41	Description and working of NH3 – water system	10/01/2020	
42	Description and working of NH3 – water system	27/01/2020	
43	Li Br –water (Two shell & Four shell) System	29/01/2020	
44	Li Br –water (Two shell & Four shell) System	30/01/2020	Lecture interspersed with discussions
45	Principle of operation three fluid absorption system, salient features	30/01/2020	
46	Principle of operation three fluid absorption system, salient features	31/01/2020	
47	STEAM JET REFRIGERATION SYSTEM	03/02/2020	
48	STEAM JET REFRIGERATION SYSTEM	04/02/2020	
49	Working Principle and basic components. principle	05/02/2020	
50	Operation of (i) thermo electric refrigerator (ii) vortex tube	06/02/2020	
51	Operation of (i) thermo electric refrigerator (ii) vortex tube	07/02/2020	
UNIT-V	**INTRODUCTION TO AIR CONDITIONING SYSTEM**		
CO5: Become familiar with Air conditioning system			
TB:" REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI.			
	UNIT – 5 INTRODUCTION TO AIR CONDITIONING SYSTEM		Lecture interspersed with discussions
52	Psychometric properties & processes	07/02/2020	
53	Characterization of sensible and latent heat loads	10/02/2020	
54	Need for ventilation, consideration of infiltration	11/02/2020	
55	Load concepts of RSHF, GSHF- problems	12/02/2020	
56	Concept of ESHF and ADP temperature	13/02/2020	

57	Requirements of human comfort and concept of effective temperature	14/02/2020	
58	comfort chart –comfort air conditioning	14/02/2020	
59	requirements of industrial air conditioning, air conditioning load calculations.	17/02/2020	
60	Problems	24/02/2020	
61	Problems	25/02/2020	

UNIT-VI AIR CONDITIONING SYSTEM

CO6: Become familiar with concepts of Air conditioning system

TB: "REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI.

	UNIT – 6 AIR CONDITIONING SYSTEM		
62	Classification of equipment	26/02/2020	Lecture interspersed with discussions
63	Classification of equipment	27/02/2020	
64	Cooling, heating humidification	28/02/2020	
65	Dehumidification, filters, grills	28/02/2020	
66	Dehumidification, filters, grills	02/03/2020	
68	Dehumidification, filters, grills	03/03/2020	
69	Registers, fans and blowers	04/03/2020	
70	Registers, fans and blowers	05/03/2020	
71	Heat pump – heat sources	06/03/2020	
72	Different heat pump circuits.	06/03/2020	
73	Revision	09/03/2020	

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TENTATIVE PLAN: R1632034

Course Title: HEAT TRANSFER		Course code: R1632034
Section : Sec I	Date : 18-11-2019	Page No : 01 to 03
Revision No : 00	Prepared By : Y.DURGA BHAVANI	Approved By : HOD
Tools: BLACK BOARD		

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I	**INTRODUCTION TO HEAT TRANSFER**		
CO1: Become familiar with a basic concepts of modes of heat transfer			
TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT.			
	UNIT – 1 Introduction		Lecture interspersed with discussions
1	Modes and mechanisms of heat transfer	18/11/2019	
2	basic laws of heat transfer	19/11/2019	
3	General discussion about applications of heat transfer	20/11/2019	
4	Fourier rate equation	21/11/2019	
5	general heat conduction equation in Cartesian coordinates	22/11/2019	
6	general heat conduction equation in cylindrical coordinates	25/11/2019	
7	general heat conduction equation in Spherical coordinates	26/11/2019	
8	initial and boundary conditions	27/11/2019	
9	Homogeneous slabs and its problems	28/11/2019	
10	hollow cylinders and its problems	29/11/2019	
11	Hollow spheres and its problems	29/11/2019	
12	overall heat transfer coefficient – electrical analogy	02/12/2019	
13	critical radius of insulation Variable thermal conductivity	3/12/2019	
14	systems with heat sources or heat generation	04/12/2019	
15	systems without heat sources	05/12/2019	
16	problems	06/12/2019	
UNIT-II	**Extended surface**		
CO2: Gain knowledge about extended surface			
TB:" HEAT AND MASS TRANSFER", Er R.K.RAJPUT.			
	UNIT – 2 Extended surface (fins) heat Transfer		Lecture interspersed with discussions
17	Extended surface (fins) heat Transfer, types of fins	06/12/2019	
18	applications of fins	09/12/2019	
19	Heat flow through rectangular fin	10/12/2019	
20	long fin	11/12/2019	
21	long fin	12/12/2019	
22	Problems on long fin	13/12/2019	
23	short fin with insulated tip	13/12/2019	
24	Problems on short fin with insulated tip	16/12/2019	
25	short fin without insulated tip	17/12/2019	
26	Problems on short fin without insulated tip	18/12/2019	
27	transient conduction heat transfer	19/12/2019	
28	significance of biot and fourier numbers	20/12/2019	
29	chart solutions of transient conduction systems	20/12/2019	

30	Problems	23/12/2019	
31	Problems	24/12/2019	
UNIT-III	**CONVECTIVE HEAT TRANSFER**		
CO3: Become familiar with the concepts of convective heat transfer			
TB:" HEAT AND MASS TRANSFER", Er R.K.RAJPUT.			
	UNIT – 3 CONVECTIVE HEAT TRANSFER		
32	Classification of convective heat transfer	26/12/2019	
33	dimensional analysis	27/12/2019	Lecture interspersed with discussions
34	Rayleighs method and problems	27/12/2019	
35	Buckingham Pi Theorem for forced and free convection	30/12/2019	
36	problems	31/12/2019	
37	Significance of non-dimensional numbers	02/01/2020	
38	concepts of continuity	03/01/2020	
39	momentum and Energy Equations	03/01/2020	
40	problems	06/01/2020	
UNIT-IV	**FORCED CONVECTION**		
CO4: Gain knowledge about concept of hydrodynamic boundary layers on a vertical plates and pipes			
TB:" HEAT AND MASS TRANSFER", Er R.K.RAJPUT.			
	UNIT – 4 FORCED CONVECTION		
41	Concepts about hydrodynamic and thermal boundary layer	07/01/2020	
42	Concepts about hydrodynamic and thermal boundary layer	09/01/2020	
43	boundary layer and use of empirical correlations for convective heat transfer	10/01/2020	
44	flat plates and cylinders	27/01/2020	
45	internal flows	29/01/2020	Lecture interspersed with discussions
46	Concepts about hydrodynamic and thermal entry lengths	30/01/2020	
47	division of internal flow based on this	30/01/2020	
48	use of empirical relations for horizontal pipe flow	31/01/2020	
49	annulus flow	03/02/2020	
50	FREE CONVECTION	04/02/2020	
51	Development of hydrodynamic and thermal boundary layer along a vertical plate	05/02/2020	
52	use of empirical relations for vertical plates and pipes	06/02/2020	
53	problems	07/02/2020	
UNIT-V	**HEAT TRANSFER WITH PHASE CHANGE BOILING**		
CO5: Become familiar with heat transfer with phase change boiling			
TB:" HEAT AND MASS TRANSFER", Er R.K.RAJPUT.			
	UNIT – 5 HEAT TRANSFER WITH PHASE CHANGE BOILING		
54	Pool boiling	07/02/2020	
55	film and drop wise condensation	10/02/2020	
56	nusselt's theory of condensation on a vertical plate	11/02/2020	Lecture interspersed with discussions
57	film condensation on vertical and horizontal cylinders using empirical correlations	12/02/2020	
58	heat exchangers	13/02/2020	
59	Classification of heat exchangers	14/02/2020	
60	overall heat transfer coefficient and fouling factor	14/02/2020	
61	concepts of LMTD and NTU methods	17/02/2020	
62	Problems	24/02/2020	

63	Problems	25/02/2020	

UNIT-VI WORK – RADIATION HEAT TRANSFER

CO6: Become familiar with concepts of emission characteristics, heat exchange between grey bodies.

TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT.

	UNIT – 6 RADIATION HEAT TRANSFER		Lecture interspersed with discussions
64	Emission characteristics and laws of black-body radiation	26/02/2020	
65	Irradiation	27/02/2020	
66	total and monochromatic quantities	28/02/2020	
67	laws of Planck, Wien, Kirchoff	28/02/2020	
68	Lamber, Stefan and Boltzmann	02/03/2020	
69	heat exchange between two black bodies	03/03/2020	
70	concepts of shape factor	04/03/2020	
71	Emissivity – heat exchange between grey bodies	05/03/2020	
72	radiation shields	06/03/2020	
73	electrical analogy for radiation networks	06/03/2020	
74	Problems	09/03/2020	

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TENTATIVE PLAN: R1632034

Course Title: HEAT TRANSFER		Course code: R1632034	
Section : Sec II	Date : 18-11-2019	Page No : 01 to 03	
Revision No : 00	Prepared By : Y.DURGA BHAVANI	Approved By : HOD	
Tools: BLACK BOARD			

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I	**INTRODUCTION TO HEAT TRANSFER**		
CO1: Become familiar with a basic concepts of modes of heat transfer			
TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT.			
	UNIT – 1 Introduction		Lecture interspersed with discussions
1	Modes and mechanisms of heat transfer	18/11/2019	
2	basic laws of heat transfer	19/11/2019	
3	General discussion about applications of heat transfer	20/11/2019	
4	Fourier rate equation	21/11/2019	
5	general heat conduction equation in Cartesian coordinates	22/11/2019	
6	general heat conduction equation in cylindrical coordinates	25/11/2019	
7	general heat conduction equation in Spherical coordinates	26/11/2019	
8	initial and boundary conditions	27/11/2019	
9	Homogeneous slabs and its problems	28/11/2019	
10	hollow cylinders and its problems	29/11/2019	
11	Hollow spheres and its problems	29/11/2019	
12	overall heat transfer coefficient – electrical analogy	03/12/2019	
13	critical radius of insulation Variable thermal conductivity	04/12/2019	
14	systems with heat sources or heat generation	04/12/2019	
15	systems without heat sources	05/12/2019	
16	problems	06/12/2019	
UNIT-II	**Extended surface**		
CO2: Gain knowledge about extended surface			
TB:" HEAT AND MASS TRANSFER", Er R.K.RAJPUT.			
	UNIT – 2 Extended surface (fins) heat Transfer		Lecture interspersed with discussions
17	Extended surface (fins) heat Transfer, types of fins	07/12/2019	
18	applications of fins	10/12/2019	
19	Heat flow through rectangular fin	11/12/2019	
20	long fin	11/12/2019	
21	long fin	13/12/2019	
22	Problems on long fin	17/12/2019	
23	short fin with insulated tip	18/12/2019	
24	Problems on short fin with insulated tip	18/12/2019	
25	short fin without insulated tip	19/12/2019	
26	Problems on short fin without insulated tip	20/12/2019	
27	transient conduction heat transfer	20/12/2019	
28	significance of biot and fourier numbers	24/12/2019	
29	chart solutions of transient conduction systems	26/12/2019	

31	Problems	02/01/2020		
UNIT-III	**CONVECTIVE HEAT TRANSFER**			
CO3: Become familiar with the concepts of convective heat transfer				
TB:" HEAT AND MASS TRANSFER", Er R.K.RAJPUT.				
	UNIT – 3 CONVECTIVE HEAT TRANSFER		Lecture interspersed with discussions	
32	Classification of convective heat transfer	03/01/2020		
33	dimensional analysis	04/01/2020		
34	Rayleighs method and problems	07/01/2020		
35	Buckingham Pi Theorem for forced and free convection	09/01/2020		
36	problems	09/01/2020		
37	Significance of non-dimensional numbers	10/01/2020		
38	concepts of continuity	28/01/2020		
39	momentum and Energy Equations	29/01/2020		
40	problems	29/01/2020		
UNIT-IV	**FORCED CONVECTION**			
CO4: Gain knowledge about concept of hydrodynamic boundary layers on a vertical plates and pipes				
TB:" HEAT AND MASS TRANSFER", Er R.K.RAJPUT.				
	UNIT – 4 FORCED CONVECTION		Lecture interspersed with discussions	
41	Concepts about hydrodynamic and thermal boundary layer	30/01/2020		
42	Concepts about hydrodynamic and thermal boundary layer	31/01/2020		
43	boundary layer and use of empirical correlations for convective heat transfer	03/02/2020		
44	flat plates and cylinders	04/02/2020		
45	internal flows	05/02/2020		
46	Concepts about hydrodynamic and thermal entry lengths	05/02/2020		
47	division of internal flow based on this	06/02/2020		
48	use of empirical relations for horizontal pipe flow	06/02/2020		
49	annulus flow	07/02/2020		
50	FREE CONVECTION	11/02/2020		
51	Development of hydrodynamic and thermal boundary layer along a vertical plate	11/02/2020		
52	use of empirical relations for vertical plates and pipes	12/02/2020		
53	problems	13/02/2020		
54	problems	14/02/2020		
UNIT-V	**HEAT TRANSFER WITH PHASE CHANGE BOILING**			
CO5: Become familiar with heat transfer with phase change boiling				
TB:" HEAT AND MASS TRANSFER", Er R.K.RAJPUT.				
	UNIT – 5 HEAT TRANSFER WITH PHASE CHANGE BOILING		Lecture interspersed with discussions	
55	Pool boiling	15/02/2020		
56	film and drop wise condensation	17/02/2020		
57	nusselt's theory of condensation on a vertical plate	18/02/2020		
58	film condensation on vertical and horizontal cylinders using empirical correlations	24/02/2020		
59	heat exchangers	25/02/2020		
60	Classification of heat exchangers	26/02/2020		
61	overall heat transfer coefficient and fouling factor	26/02/2020		
62	concepts of LMTD and NTU methods	27/02/2020		
63	Problems	28/02/2020		

UNIT-VI WORK – RADIATION HEAT TRANSFER

CO6: Become familiar with concepts of emission characteristics, heat exchange between grey bodies.

TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT.

	UNIT – 6 RADIATION HEAT TRANSFER		
64	Emission characteristics and laws of black-body radiation	02/03/2020	Lecture interspersed with discussions
65	Irradiation	03/03/2020	
66	total and monochromatic quantities	04/03/2020	
67	laws of Planck, Wien, Kirchoff	04/03/2020	
68	Lamber, Stefan and Boltzmann	05/03/2020	
69	heat exchange between two black bodies	06/03/2020	
70	concepts of shape factor	07/03/2020	
71	Emissivity – heat exchange between grey bodies	16/03/2020	
72	radiation shields	17/03/2020	
73	electrical analogy for radiation networks	18/03/2020	
74	Problems	19/03/2020	

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TENTATIVE LESSON PLAN

Course Title: INDUSTRIAL ROBOTICS		Course code: R163203C	
Section : Sec A	Date : 21/11/2019	Page No : 01 to 03	
Revision No : 00	Prepared By : A.STANLY KUMAR	Approved By : HOD	
Tools: BLACK BOARD			

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION **CO1: Students will get an idea about Robot and its operations.** **TB : Robotics and Control / Mittal R K & Nagrath I J**			
1	Automation and robotics	22/11/2019	Lecture interspersed with discussions
2	CAD/CAM	23/11/2019	
3	An over view of Robotics	25/11/2019	
4	Robotics-present and future applications	26/11/2019	
5	Present and future applications of Robotics.	30/11/2019	
6	Classification of Robots	2/12/2019	
7	Classification by coordinate system	3/12/2019	
8	Classification by control system	6/12/2019	
9	Tutorials	7/12/2019	
UNIT-II COMPONENTS OF THE INDUSTRIAL ROBOTICS. **CO2: Student able to know the different parts of Robot.** **TB : Robotics and Control / Mittal R K & Nagrath I J**			
10	Function line diagram	9/12/2019	Lecture interspersed with discussions
11	Function line diagram representation of robot arms	10/12/2019	
12	Common types of arms	13/12/2019	
13	Components, Architecture	14/12/2019	
14	Number of degrees of freedom – Requirements and challenges of end effectors	16/12/2019	
15	Determination of the end effectors	17/12/2019	
16	Electric locomotion devices	20/12/2019	
17	Hydraulic and Pneumatic types of locomotion devices	21/12/2019	
18	Tutorials	24/12/2019	
UNIT-III MOTION ANALYSIS, MANIPULATOR KINEMATICS. **CO3: Able to learn about different motions in robot and manipulators and Kinematics.** **TB : Robotics and Control / Mittal R K & Nagrath I J**			
19	Homogeneous transformation related to translation	27/12/2019	Lecture
20	Homogeneous transformation related to rotation	28/12/2019	
21	Homogeneous transformations problems	30/12/2019	
22	Specifications of matrices	31/12/2019	
23	Denavit-Hartenberg notation	3/1/2020	

24	Joint coordinates and world coordinates	4/1/2020	interspersed with discussions
25	Forward kinematics –problems. Inverse kinematics –problems.	6/1/2020	
26	Tutorials	7/1/2020	
27	Homogeneous transformation related to translation	10/1/2020	
28	Homogeneous transformation related to rotation	11/1/2020	
29	Homogeneous transformations problems	13/1/2020	
30	Specifications of matrices	14/1/2020	
31	Denavit-Hartenberg notation	14/1/2020	
32	Joint coordinates and world coordinates	24/1/2020	
33	Forward kinematics –problems. Inverse kinematics –problems.		
34	Tutorials	25/1/2020	

UNIT-IV JACOBIANS, LAGRANGE's FORMULATIONS.
CO4: Gained knowledge about the motion control methods.
TB : Robotics and Control / Mittal R K & Nagrath I J

30	Differential transformation, and manipulators– problems	27/1/2020	Lecture interspersed with discussions
31	Jacobians, singularities	28/1/2020	
32	Jacobians-problems	31/1/2020	
33	Dynamics: Lagrange – Euler formulations – Problems	3/2/2020	
34	Dynamics: Newton – Euler formulations – Problems	4/2/2020	
35	Tutorials	7/2/2020	

UNIT-V GENERAL CONSIDERATION OF THE ROBOT PATH AND TRAJECTORY.
CO5: Students are able to understand the Path and Trajectory of the Robot when working.
TB : Robotics and Control / Mittal R K & Nagrath I J

36	General considerations in path description & generation.	8/2/2020	Lecture interspersed with discussions
37	Trajectory planning and avoidance of obstacles,	10/2/2020	
38	path planning,	11/2/2020	
39	Skew motion, joint integrated motion –straight line motion	14/2/2020	
40	Robot programming,	15/2/2020	
41	Robot languages	21/2/2020	
42	Software packages-description of paths with a robot programming language	22/2/2020	
43	Tutorial	25/2/2020	

UNIT-VI ROBOT ACTUATORS AND FEED BACK COMPONENTS.
CO6: Able to know the actuators and feedback of the Robot components.
TB : Robotics and Control / Mittal R K & Nagrath I J

44	Actuators: Pneumatic actuators	3/3/2020	Lecture interspersed
45	Actuators: Hydraulic actuators	4/3/2020	

46	Actuators: electric a.c, d.c	7/3/2020	with discussions
47	Stepper motors	8/3/2020	
48	Feedback components: position sensors.	10/3/2020	
49	Potentiometers and Resolvers	17/3/2020	
50	Encoders	18/3/2020	
51	Velocity sensors- tachometers	18/3/2020	

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TENTATIVE LESSON PLAN

Course Title: INDUSTRIAL ROBOTICS		Course code: R163203C	
Section : Sec B	Date : 21/11/2019	Page No : 01 to 03	
Revision No : 00	Prepared By : A.STANLY KUMAR	Approved By : HOD	
Tools: BLACK BOARD			

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION **CO1: Students will get an idea about Robot and its operations.** **TB : Robotics and Control / Mittal R K & Nagrath I J**			
1	Automation and robotics	22/11/2019	Lecture interspersed with discussions
2	CAD/CAM	23/11/2019	
3	An over view of Robotics	25/11/2019	
4	Robotics-present and future applications	26/11/2019	
5	Present and future applications of Robotics.	30/11/2019	
6	Classification of Robots	2/12/2019	
7	Classification by coordinate system	3/12/2019	
8	Classification by control system	6/12/2019	
9	Tutorials	7/12/2019	
UNIT-II COMPONENTS OF THE INDUSTRIAL ROBOTICS. **CO2: Student able to know the different parts of Robot.** **TB : Robotics and Control / Mittal R K & Nagrath I J**			
10	Function line diagram	9/12/2019	Lecture interspersed with discussions
11	Function line diagram representation of robot arms	10/12/2019	
12	Common types of arms	13/12/2019	
13	Components, Architecture	14/12/2019	
14	Number of degrees of freedom – Requirements and challenges of end effectors	16/12/2019	
15	Determination of the end effectors	17/12/2019	
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17	Hydraulic and Pneumatic types of locomotion devices	21/12/2019	
18	Tutorials	24/12/2019	
UNIT-III MOTION ANALYSIS, MANIPULATOR KINEMATICS. **CO3: Able to learn about different motions in robot and manipulators and Kinematics.** **TB : Robotics and Control / Mittal R K & Nagrath I J**			
19	Homogeneous transformation related to translation	27/12/2019	Lecture
20	Homogeneous transformation related to rotation	28/12/2019	
21	Homogeneous transformations problems	30/12/2019	
22	Specifications of matrices	31/12/2019	
23	Denavit-Hartenberg notation	3/1/2020	

24	Joint coordinates and world coordinates	4/1/2020	interspersed with discussions
25	Forward kinematics –problems. Inverse kinematics –problems.	6/1/2020	
26	Tutorials	7/1/2020	
27	Homogeneous transformation related to translation	10/1/2020	
28	Homogeneous transformation related to rotation	11/1/2020	
29	Homogeneous transformations problems	13/1/2020	
30	Specifications of matrices	14/1/2020	
31	Denavit-Hartenberg notation	14/1/2020	
32	Joint coordinates and world coordinates	24/1/2020	
33	Forward kinematics –problems. Inverse kinematics –problems.		
34	Tutorials	25/1/2020	
UNIT-IV JACOBIANS, LAGRANGE's FORMULATIONS. **CO4: Gained knowledge about the motion control methods.** **TB : Robotics and Control / Mittal R K & Nagrath I J**			
30	Differential transformation, and manipulators– problems	27/1/2020	Lecture interspersed with discussions
31	Jacobians, singularities	28/1/2020	
32	Jacobians-problems	31/1/2020	
33	Dynamics: Lagrange – Euler formulations – Problems	3/2/2020	
34	Dynamics: Newton – Euler formulations – Problems	4/2/2020	
35	Tutorials	7/2/2020	
UNIT-V GENERAL CONSIDERATION OF THE ROBOT PATH AND TRAJECTORY. **CO5: Students are able to understand the Path and Trajectory of the Robot when working.** **TB : Robotics and Control / Mittal R K & Nagrath I J**			
36	General considerations in path description & generation.	8/2/2020	Lecture interspersed with discussions
37	Trajectory planning and avoidance of obstacles,	10/2/2020	
38	path planning,	11/2/2020	
39	Skew motion, joint integrated motion –straight line motion	14/2/2020	
40	Robot programming,	15/2/2020	
41	Robot languages	21/2/2020	
42	Software packages-description of paths with a robot programming language	22/2/2020	
43	Tutorial	25/2/2020	
UNIT-VI ROBOT ACTUATORS AND FEED BACK COMPONENTS. **CO6: Able to know the actuators and feedback of the Robot components.** **TB : Robotics and Control / Mittal R K & Nagrath I J**			
44	Actuators: Pneumatic actuators	3/3/2020	Lecture interspersed
45	Actuators: Hydraulic actuators	4/3/2020	

46	Actuators: electric a.c, d.c	7/3/2020	with discussions
47	Stepper motors	8/3/2020	
48	Feedback components: position sensors.	10/3/2020	
49	Potentiometers and Resolvers	17/3/2020	
50	Encoders	18/3/2020	
51	Velocity sensors- tachometers	18/3/2020	

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TENTATIVE LESSON PLAN

Course Title: PPC		Course Code: R1642031
Section : Sec A	Date : 07/11/2019	Page No : 01 of 03
Revision No : 00	Prepared By : B NAGENDRA	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION **CO1: AN UNDERSTANDING OF THE CONCEPTS OF PRODUCTION AND SERVICE SYSTEMS**			
1	Introduction: Definition	07/11/2019	Lecture interspersed with discussions
2	objectives and functions of production planning and control	08/11/2019	
3	Elements of production control	09/11/2019	
4	types of production	10/11/2019	
5	organization of production planning and control department	11/11/2019	
6	internal organization of department	14/11/2019	
7	Importance and applications of production control	15/11/2019	
8	Practice on above topics	16/11/2019	
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-II FORECASTING CO2: Able to Understand The ability to apply principles and techniques in the design, planning and control of these systems to optimise/make best use of resources in achieving their objectives TB2: Manufacturing, Planning and Control/Partik Jonsson Stig-Arne Mattsson/TataMcGrawHill			
1	Introduction about forecasting	17/11/2019	Lecture interspersed with
2	Forecasting – importance of forecasting	18/11/2019	
3	Types of forecasting	19/11/2019	
4	Types of forecasting	20/11/2019	

5	their uses – general principles of forecasting	22/11/2019	discussions
6	forecasting techniques	23/11/2019	
7	qualitative methods and quantative methods	24/11/2019	
8	principles and techniques in the design	25/11/2019	
9	best use of resources in achieving their objectives	27/11/2019	
10	planning and control of these systems to optimize	28/11/2019	
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-III Inventory management **CO3: Able to UNNDERSTAND Inventory management** **T TB:** Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp			
1	Inventory management	30/11/2019	Lecture interspersed with discussions
2	functions of inventories – relevant inventory costs	2/12/2020	
3	ABC analysis – VED analysis	3/12/2020	
4	EOQ model – Inventory control systems	4/12/2020	
5	P–Systems and Q-Systems	5/12/2020	
6	Introduction to MRP I, MRP II, ERP, LOB(Line of Balance)	6/12/2020	
7	JIT and KANBAN system	8/12/2020	
8	MRP II, ERP, LOB(Line of Balance),	9/12/2020	
9	EOQ model – Inventory control systems	12/12/2020	
10	P–Systems and Q-Systems	13/12/2020	
11	Revision on above topics	14/12/2020	
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-IV ROUTING **CO4: Able to UNNDERSTAND** Routing and importance **T TB:** Manufacturing, Planning and Control/Partik Jonsson Stig-Arne Mattsson/TataMcGrawHill			
1	Routing – definition	15/10/2020	Lecture interspersed with
2	routing procedure –route sheets	16/12/2020	
3	bill of material – factors affecting routing procedure,	17/12/2020	
4	schedule –definition – difference with loading	18/12/2020	

			discussions
5	factors affecting routing procedure	20/12/2020	
6	Revision on above topics	21/12/2020	
7	Revision on above topics	22/12/2020	
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-V Scheduling policies – techniques **CO5: Able to UNNDERSTAND** Scheduling policies – techniques **T TB: Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp**			
1	Scheduling policies – techniques	23/12/2020	
2	standard scheduling methods	24/12/2020	
3	Line Balancing	28/12/2020	Lecture interspersed with discussions
4	aggregate planning	29/12/2020	
5	chase planning	30/12/2020	
6	expediting, and controlling aspects	01/01/2021	
7	Revision on above topics	02/01/2021	
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-VI Dispatching **CO6: Able to UNNDERSTAND Dispatching** **T TB:** Manufacturing, Planning and Control/Partik Jonsson Stig-Arne Mattsson/TataMcGrawHill			
1	Dispatching – activities of dispatcher	03/01/2021	
2	dispatching procedure – follow up	04/01/2021	
3	definition – reason for existence of functions	05/01/2021	
4	types of follow up	20/01/2021	Lecture interspersed with discussions
5	applications of computer in production planning and control	22/01/2021	
6	importance of computer in production planning and control	13/02/2021	
7	Dispatching – activities of dispatcher	14/02/2021	
8	Revision	15/02/2021	
9	Revision	16/02/2021	

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Date: 7/11/19

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Date: 7/11/19

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TANTATIVE LESSON PLANE

Course Title: PPC		Course Code: R1642031
Section : Sec B	Date : 07/11/2019	Page No : 01 of 03
Revision No : 00	Prepared By : Dr. T S S BALAJI	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION **CO1: AN UNDERSTANDING OF THE CONCEPTS OF PRODUCTION AND SERVICE SYSTEMS**			
1	Introduction: Definition	07/11/2019	Lecture interspersed with discussions
2	objectives and functions of production planning and control	08/11/2019	
3	Elements of production control	09/11/2019	
4	types of production	10/11/2019	
5	organization of production planning and control department	11/11/2019	
6	internal organization of department	14/11/2019	
7	Importance and applications of production control	15/11/2019	
8	Practice on above topics	16/11/2019	
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-II FORECASTING **CO1: Able to Understand The ability to apply principles and techniques in the design, planning and control of these systems to optimise/make best use of resources in achieving their objectives** **TB2: Manufacturing, Planning and Control/Partik Jonsson Stig-Arne Mattsson/TataMcGrawHill**			
1	Introduction about forecasting	17/11/2019	Lecture interspersed with discussions
2	Forecasting – importance of forecasting	18/11/2019	
3	Types of forecasting	19/11/2019	
4	Types of forecasting	20/11/2019	
5	their uses – general principles of forecasting	22/11/2019	
6	forecasting techniques	23/11/2019	

7	qualitative methods and quantative methods	24/11/2019	
8	principles and techniques in the design	25/11/2019	
9	best use of resources in achieving their objectives	27/11/2019	
10	planning and control of these systems to optimize	28/11/2019	
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-III Inventory management **CO1: Able to UNNDERSTAND Inventory management** **T TB:** Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp			
1	Inventory management	30/11/2019	
2	functions of inventories – relevant inventory costs	2/12/2020	
3	ABC analysis – VED analysis	3/12/2020	
4	EOQ model – Inventory control systems	4/12/2020	
5	P–Systems and Q-Systems	5/12/2020	Lecture interspersed with discussions
6	Introduction to MRP I, MRP II, ERP, LOB(Line of Balance)	6/12/2020	
7	JIT and KANBAN system	8/12/2020	
8	MRP II, ERP, LOB(Line of Balance),	9/12/2020	
9	EOQ model – Inventory control systems	12/12/2020	
10	P–Systems and Q-Systems	13/12/2020	
11	Revision on above topics	14/12/2020	
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-IV ROUTING **CO1: Able to UNNDERSTAND** Routing and importance **T TB:** Manufacturing, Planning and Control/Partik Jonsson Stig-Arne Mattsson/TataMcGrawHill			
1	Routing – definition	15/10/2020	
2	routing procedure –route sheets	16/12/2020	Lecture interspersed with discussions
3	bill of material – factors affecting routing procedure,	17/12/2020	
4	schedule –definition – difference with loading	18/12/2020	
5	factors affecting routing procedure	20/12/2020	

6	Revision on above topics	21/12/2020	
7	Revision on above topics	22/12/2020	
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-V Scheduling policies – techniques **CO1: Able to UNNDERSTAND** Scheduling policies – techniques **T TB: Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp**			
1	Scheduling policies – techniques	23/12/2020	Lecture interspersed with discussions
2	standard scheduling methods	24/12/2020	
3	Line Balancing	28/12/2020	
4	aggregate planning	29/12/2020	
5	chase planning	30/12/2020	
6	expediting, and controlling aspects	01/01/2021	
7	Revision on above topics	02/01/2021	
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-VI Dispatching **CO1: Able to UNNDERSTAND Dispatching** **T TB:** Manufacturing, Planning and Control/Partik Jonsson Stig-Arne Mattsson/TataMcGrawHill			
1	Dispatching – activities of dispatcher	03/01/2021	Lecture interspersed with discussions
2	dispatching procedure – follow up	04/01/2021	
3	definition – reason for existence of functions	05/01/2021	
4	types of follow up	20/01/2021	
5	applications of computer in production planning and control	22/01/2021	
6	importance of computer in production planning and control	13/02/2021	
7	Dispatching – activities of dispatcher	14/02/2021	
8	Revision	15/02/2021	
9	Revision	16/02/2021	

T.S.S. Balaji

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Date: 9/11/19

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Date: 9/11/19

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TENTATIVE LESSON PLAN: R1642032

Course Title: UNCONVENTIONAL MACHINING PROCESSES		Course code: R1642032	
Section : Sec I	Date :	Page No : 01 to 03	
Revision No : 00	Prepared By: A. STANLY KUMAR	Approved By : HOD	
Tools: BLACK BOARD			
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-I INTRODUCTION **CO1: Able to identify the classification of unconventional machining processes and gained knowledge about UCMP.** **TB: "ADVANCED MACHINING PROCESSES"/VK JAIN/ALLIED PUBLISHERS.**			
1	**INTRODUCTION:** Need for non-traditional machining methods.	25/11/19	Lecture interspersed with discussions
2	Classification of modern machining processes	27/11/19	
3	Considerations in process selection	28/11/19	
4	Applications. Ultrasonic machining	29/11/19	
5	Elements of the process	02/12/19	
6	Mechanics of material removal	03/12/19	
7	MRR process parameters, economic considerations	04/12/19	
8	Applications and limitations	05/12/19	
9	Limitations	06/12/19	
10	Revision.	09/12/19	
UNIT-II ELECTRO – CHEMICAL MACHINING **CO2:** Gained knowledge about electro chemical machining processes. **TB: " ADVANCED MACHINING PROCESSES"/VK JAIN/ALLIED PUBLISHERS.**			
11	ELECTRO – CHEMICAL MACHINING: Introduction.	10/12/19	Lecture interspersed with discussions
12	Fundamentals of electro chemical machining	11/12/19	
13	electrochemical	12/12/19	
14	grinding	13/12/19	
15	electro chemical honing	13/12/19	
16	deburring process	16/12/19	
17	metal removal rate in ECM	17/12/19	
18	Tool design	18/12/19	
19	Surface finish and accuracy	19/12/19	
20	economic aspects of ECM	20/12/19	
21	Simple problems for estimation of metal removal rate	23/12/19	
22	fundamentals of chemical	24/12/19	

23	advantages and applications.	24/12/19	

UNIT-III THERMAL METAL REMOVAL PROCESSES

CO3: Gained knowledge about thermal metal removal processes like EDM, EDG and wire EDM.

TB: "ADVANCED MACHINING PROCESSES"/VK JAIN/ALLIED PUBLISHERS.

24	General principle	26/12/19	Lecture interspersed with discussions
25	Applications of Electric Discharge Machining	27/12/19	
26	Electric Discharge Grinding	30/12/19	
27	Wire EDM – Power circuits for EDM	31/12/19	
28	Mechanics of metal removal in EDM	02/01/20	
29	Process parameters	03/01/20	
30	Selection of tool electrode and dielectric fluids,	06/01/20	
31	Surface finish and machining accuracy	07/01/20	
32	Characteristics of spark eroded surface	08/01/20	
33	Revision	09/01/20	
34	Revision	10/01/20	

UNIT-IV ELECTRON BEAM MACHINING

CO4: Gained knowledge about thermal metal removal processes like EBM and LBM.

TB: "ADVANCED MACHINING PROCESSES"/VK JAIN/ALLIED PUBLISHERS.

35	Electron beam machining	28/01/20	Lecture interspersed with discussions
36	Laser Beam Machining	29/01/20	
37	Basic principle and theory	30/01/20	
38	Mechanics of material removal, process parameters	31/01/20	
39	Efficiency	03/02/20	
40	Accuracy,	04/02/20	
41	Process parameters applications.	04/02/20	
42	Applications	05/02/20	
43	Revision	6/2/20	

UNIT-V PLASMA MACHINING

CO5: Gained knowledge about plasma machining and other application of plasma in industries.

TB: "ADVANCED MACHINING PROCESSES"/VK JAIN/ALLIED PUBLISHERS.

	Unit - 5	7/2/20	Lecture interspersed with discussions
44	Plasma Machining:	10/2/20	
45	Introduction	11/2/20	
46	Application of plasma	12/2/20	
47	Machining,	13/2/20	

48	Metal removal mechanism	14/2/20	
49	Metal removal mechanism	17/2/20	
50	Accuracy	19/2/20	
51	Process parameters,	19/2/20	
52	Surface finish	20/2/20	
53	Applications	24/2/20	
54	In manufacturing industries	25/2/20	
55	Revision	26/2/20	
56	Revision	27/2/20	
57	Revision	28/2/20	

UNIT-IV ABRASIVE JET MACHINING

CO 6: To enhance the principle, working and mechanism of metal removal of AJM , WJM and AWJM etc.

TB: "ADVANCED MACHINING PROCESSES"/VK JAIN/ALLIED PUBLISHERS.

58	Abrasive jet machining,	2/3/20	Lecture interspersed with discussions
59	Water jet machining	3/3/20	
60	Abrasive water jet machining	4/3/20	
61	Variables,	5/3/20	
62	Mechanics of material removal	6/3/20	
63	Application and limitations	9/3/20	
64	Magnetic abrasive finishing, abrasive flow finishing	10/3/20	
65	Electro stream drilling	11/3/20	
66	Shaped tube	12/3/20	
67	Electrolytic machining	13/3/20	
68	Revision	16/3/20	

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Signature of HOD
Date: 7/11/19

TENTATIVE LESSON PLAN: R1642032

Course Title: UNCONVENTIONAL MACHINING PROCESSES		Course code: R1642032	
Section : Sec II	Date :	Page No : 01 to 03	
Revision No : 00	Prepared By: A. STANLY KUMAR	Approved By : HOD	
Tools: BLACK BOARD			
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
UNIT-I INTRODUCTION **CO1: Able to identify the classification of unconventional machining processes and gained knowledge about UCMP.** **TB: "ADVANCED MACHINING PROCESSES"/VK JAIN/ALLIED PUBLISHERS.**			
1	**INTRODUCTION:** Need for non-traditional machining methods.	25/11/19	Lecture interspersed with discussions
2	Classification of modern machining processes	27/11/19	
3	Considerations in process selection	28/11/19	
4	Applications. Ultrasonic machining	29/11/19	
5	Elements of the process	02/12/19	
6	Mechanics of material removal	03/12/19	
7	MRR process parameters, economic considerations	04/12/19	
8	Applications and limitations	05/12/19	
9	Limitations	06/12/19	
10	Revision.	09/12/19	
UNIT-II ELECTRO – CHEMICAL MACHINING **CO2:** Gained knowledge about electro chemical machining processes. **TB: " ADVANCED MACHINING PROCESSES"/VK JAIN/ALLIED PUBLISHERS.**			
11	ELECTRO – CHEMICAL MACHINING: Introduction.	10/12/19	Lecture interspersed with discussions
12	Fundamentals of electro chemical machining	11/12/19	
13	electrochemical	12/12/19	
14	grinding	13/12/19	
15	electro chemical honing	13/12/19	
16	deburring process	16/12/19	
17	metal removal rate in ECM	17/12/19	
18	Tool design	18/12/19	
19	Surface finish and accuracy	19/12/19	
20	economic aspects of ECM	20/12/19	
21	Simple problems for estimation of metal removal rate	23/12/19	
22	fundamentals of chemical	24/12/19	

23	advantages and applications.	24/12/19	

UNIT-III THERMAL METAL REMOVAL PROCESSES

CO3: Gained knowledge about thermal metal removal processes like EDM, EDG and wire EDM.

TB: "ADVANCED MACHINING PROCESSES"/VK JAIN/ALLIED PUBLISHERS.

24	General principle	26/12/19	Lecture interspersed with discussions
25	Applications of Electric Discharge Machining	27/12/19	
26	Electric Discharge Grinding	30/12/19	
27	Wire EDM – Power circuits for EDM	31/12/19	
28	Mechanics of metal removal in EDM	02/01/20	
29	Process parameters	03/01/20	
30	Selection of tool electrode and dielectric fluids,	06/01/20	
31	Surface finish and machining accuracy	07/01/20	
32	Characteristics of spark eroded surface	08/01/20	
33	Revision	09/01/20	
34	Revision	10/01/20	

UNIT-IV ELECTRON BEAM MACHINING

CO4: Gained knowledge about thermal metal removal processes like EBM and LBM.

TB: "ADVANCED MACHINING PROCESSES"/VK JAIN/ALLIED PUBLISHERS.

35	Electron beam machining	28/01/20	Lecture interspersed with discussions
36	Laser Beam Machining	29/01/20	
37	Basic principle and theory	30/01/20	
38	Mechanics of material removal, process parameters	31/01/20	
39	Efficiency	03/02/20	
40	Accuracy,	04/02/20	
41	Process parameters applications.	04/02/20	
42	Applications	05/02/20	
43	Revision	6/2/20	

UNIT-V PLASMA MACHINING

CO5: Gained knowledge about plasma machining and other application of plasma in industries.

TB: "ADVANCED MACHINING PROCESSES"/VK JAIN/ALLIED PUBLISHERS.

	Unit - 5	7/2/20	Lecture interspersed with discussions
44	Plasma Machining:	10/2/20	
45	Introduction	11/2/20	
46	Application of plasma	12/2/20	
47	Machining,	13/2/20	

48	Metal removal mechanism	14/2/20	
49	Metal removal mechanism	17/2/20	
50	Accuracy	19/2/20	
51	Process parameters,	19/2/20	
52	Surface finish	20/2/20	
53	Applications	24/2/20	
54	In manufacturing industries	25/2/20	
55	Revision	26/2/20	
56	Revision	27/2/20	
57	Revision	28/2/20	

UNIT-IV ABRASIVE JET MACHINING

CO 6: To enhance the principle, working and mechanism of metal removal of AJM , WJM and AWJM etc.

TB: "ADVANCED MACHINING PROCESSES"/VK JAIN/ALLIED PUBLISHERS.

58	Abrasive jet machining,	2/3/20	Lecture interspersed with discussions
59	Water jet machining	3/3/20	
60	Abrasive water jet machining	4/3/20	
61	Variables,	5/3/20	
62	Mechanics of material removal	6/3/20	
63	Application and limitations	9/3/20	
64	Magnetic abrasive finishing, abrasive flow finishing	10/3/20	
65	Electro stream drilling	11/3/20	
66	Shaped tube	12/3/20	
67	Electrolytic machining	13/3/20	
68	Revision	16/3/20	

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Date: 7/11/19

TENTATIVE PLAN: R1642033

Course Title: AUTOMOBILE ENGINEERING		Course code: R1642033
Section: Sec I	Date: 10-06-2019	Page No: 01 to 03
Revision No: 00	Prepared By: U. TANOJ	Approved By: HOD
Tools: BLACK BOARD		

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I	**INTRODUCTION**		
CO1: Able to understand basics of automobile engineering & their applications			
TB: "AUTOMOBILE ENGINEERING", Er KIRPAL SINGH.			
	UNIT-1: Introduction		Lecture interspersed with discussions
1	Introduction: Components of four-wheeler automobile- Chassis & body	25/11/19	
2	Power unit- Power transmission	27/11/19	
3	Rear wheel drive, Front wheel drive & Four-wheel drive	28/11/19	
4	Types of Automobile Engines & Construction	29/11/19	
5	Turbo charging & Super charging	02/12/19	
6	Engine Lubrication system, Splash & Pressure lubrication system	03/12/19	
7	Oil filters & oil pumps	04/12/19	
8	Crankcase ventilation	05/12/19	
9	Engine service & reboring	05/12/19	
10	Decarbonization	06/12/19	
11	Nitriding of crankshaft	09/12/19	
UNIT-II	**TRANSMISSION SYSTEM**		
CO2: Gain knowledge & become familiar with the functions of transmission system of an automobile & it's uses			
TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN.			
	UNIT – 2: Transmission system		Lecture interspersed with discussions
12	Transmission system & Types of clutches	10/12/19	
13	Cone clutch, single plate clutch & multi-plate clutch	11/12/19	
14	Magnetic & centrifugal clutches	12/12/19	
15	Fluid fly-wheel & types of gear boxes	13/12/19	
16	Sliding mesh & construct mesh gear box	13/12/19	
17	Synchro mesh & Epicyclic gear box	16/12/19	
18	Overdrive torque convertor	17/12/19	
19	Propeller shaft & Hotch kiss drive	19/12/19	
20	Torque tube drive	20/12/19	
21	Universal joint	23/12/19	
22	Differential rear axles types	24/12/19	
23	Types of wheels & tires	24/12/19	
UNIT-III	**STEERING SYSTEM**		
CO3: Able to understand fundamentals of Steering system in an automobile & its functions			
TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN.			
	UNIT – 3: Steering system		Lecture interspersed with discussions
24	Steering system introduction & steering geometry	26/12/19	
25	Camber & caster angle	27/12/19	
26	King-pin rake angle	30/12/19	
27	Combined angle toe-in & toe-out	31/12/19	

28	Center point steering	31/12/19	
29	Types of steering mechanisms	03/01/20	
30	Ackermann steering mechanism	04/01/20	
31	Types of steering gears	05/01/20	
32	Types of steering linkages	06/01/20	
UNIT-IV	**SUSPENSION SYSTEM, BRAKING SYSTEM & ELECTRICAL SYSTEM**		
CO4: Able to understand fundamentals of suspension, braking & electrical systems & their functions & uses			
TB:" AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN.			
	UNIT – 4 Suspension system, Braking system & Electrical system		
	Suspension system		
33	Suspension system introduction	09/01/20	
34	Objects of suspension system	10/01/20	
35	Rigid axle suspension system	27/01/20	
36	Torsion bar & Shock absorber	28/01/20	
37	Independent suspension systems	29/01/20	
38	**Braking system**		
39	Braking system introduction & types of braking systems	30/01/20	
40	Mechanical brake system & Hydraulic brake system	31/01/20	Lecture interspersed with discussions
41	Master cylinder, wheel cylinder & tandem master cylinder	03/02/20	
42	Requirement of brake fluid brakes	04/02/20	
43	Pneumatic & vacuum brakes	05/02/20	
44	**Electrical system**		
45	Electrical system & types of circuits	05/02/20	
46	Charging circuit, generator & current	06/02/20	
47	Voltage regulator & starting system	07/02/20	
48	Bendix drive mechanism	10/02/20	
49	Solenoid switch & lighting system	11/02/20	
50	Horns, Wiper & Fuel guage	11/02/20	
51	Oil pressure guage	12/02/20	
52	Engine temperature indicator system	13/02/20	
UNIT-V ENGINE SPECIFICATION & SAFETY SYSTEMS			
CO5: Gain knowledge & become familiar with the Engine specification & their safety systems of an automobile			
TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN.			
	UNIT – 5 Engine specification & safety systems		
53	Engine specification & safety systems with regard to power	14/02/20	
54	Safety system with regard to speed, torque & no of cylinders	14/02/20	
55	Arrangement, lubrication & cooling	17/02/20	Lecture interspersed with discussions
56	Safety introduction & Types safety systems	19/02/20	
57	Seat belt construction	20/02/20	
58	Air bags types & Bumper	20/02/20	
59	Anti-lock braking systems (ABS)	24/02/20	
60	Wind shield	25/02/20	
61	Suspension sensors & traction control	26/02/20	
62	Mirrors & central locking	26/02/20	
63	effluents from power plants	27/02/20	
64	Electric windows	28/02/20	

65	Speed control in safety sytems	02/03/20	
UNIT-VI ENGINE EMISSION CONTROL & ENGINE SERVICE **CO6: Able to understand the Emissions of an engine & its control & servicing** **TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN.**			
	UNIT – 6 Engine emission control & service		
66	Engine emission control introduction	03/03/20	Lecture interspersed with discussions
67	Types of pollutants	04/03/20	
68	Mechanism of formation	05/03/20	
69	Concentration measurement	06/03/20	
70	Methods of controlling engine modification	09/03/20	
71	Exhaust gas treatment	10/03/20	
72	Thermal & Catalytic convertors	10/03/20	
73	Use of alternative fuels for Emission control	11/03/20	
74	National & International pollution standards	11/03/20	
75	Engine Service introduction	12/03/20	
76	Service details of engine cylinder head	13/03/20	
77	Valves & Valve Mechanism	13/03/20	
78	Piston connecting rod assembly	16/03/20	
79	Cylinder block & crankshaft	17/03/20	
80	Main bearings service	18/03/20	
81	Engine re-assembly precautions	19/03/20	

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TENTATIVE PLAN: R1642033

Course Title: AUTOMOBILE ENGINEERING		Course code: R1642033
Section: Sec II	Date: 10-06-2019	Page No: 01 to 03
Revision No: 00	Prepared By: U. TANOJ	Approved By: HOD
Tools: BLACK BOARD		

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I	**INTRODUCTION**		
CO1: Able to understand basics of automobile engineering & their applications			
TB: "AUTOMOBILE ENGINEERING", Er KIRPAL SINGH.			
	UNIT-1: Introduction		Lecture interspersed with discussions
1	Introduction: Components of four-wheeler automobile- Chassis & body	25/11/19	
2	Power unit- Power transmission	27/11/19	
3	Rear wheel drive, Front wheel drive & Four-wheel drive	28/11/19	
4	Types of Automobile Engines & Construction	29/11/19	
5	Turbo charging & Super charging	02/12/19	
6	Engine Lubrication system, Splash & Pressure lubrication system	03/12/19	
7	Oil filters & oil pumps	04/12/19	
8	Crankcase ventilation	05/12/19	
9	Engine service & reboring	05/12/19	
10	Decarbonization	06/12/19	
11	Nitriding of crankshaft	09/12/19	
UNIT-II	**TRANSMISSION SYSTEM**		
CO2: Gain knowledge & become familiar with the functions of transmission system of an automobile & it's uses			
TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN.			
	UNIT – 2: Transmission system		Lecture interspersed with discussions
12	Transmission system & Types of clutches	10/12/19	
13	Cone clutch, single plate clutch & multi-plate clutch	11/12/19	
14	Magnetic & centrifugal clutches	12/12/19	
15	Fluid fly-wheel & types of gear boxes	13/12/19	
16	Sliding mesh & construct mesh gear box	13/12/19	
17	Synchro mesh & Epicyclic gear box	16/12/19	
18	Overdrive torque convertor	17/12/19	
19	Propeller shaft & Hotch kiss drive	19/12/19	
20	Torque tube drive	20/12/19	
21	Universal joint	23/12/19	
22	Differential rear axles types	24/12/19	
23	Types of wheels & tires	24/12/19	
UNIT-III	**STEERING SYSTEM**		
CO3: Able to understand fundamentals of Steering system in an automobile & its functions			
TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN.			
	UNIT – 3: Steering system		Lecture interspersed with discussions
24	Steering system introduction & steering geometry	26/12/19	
25	Camber & caster angle	27/12/19	
26	King-pin rake angle	30/12/19	
27	Combined angle toe-in & toe-out	31/12/19	

28	Center point steering	31/12/19	
29	Types of steering mechanisms	03/01/20	
30	Ackermann steering mechanism	04/01/20	
31	Types of steering gears	05/01/20	
32	Types of steering linkages	06/01/20	
UNIT-IV	**SUSPENSION SYSTEM, BRAKING SYSTEM & ELECTRICAL SYSTEM**		
CO4: Able to understand fundamentals of suspension, braking & electrical systems & their functions & uses			
TB:" AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN.			
	UNIT – 4 Suspension system, Braking system & Electrical system		
	Suspension system		
33	Suspension system introduction	09/01/20	
34	Objects of suspension system	10/01/20	
35	Rigid axle suspension system	27/01/20	
36	Torsion bar & Shock absorber	28/01/20	
37	Independent suspension systems	29/01/20	
38	**Braking system**		
39	Braking system introduction & types of braking systems	30/01/20	
40	Mechanical brake system & Hydraulic brake system	31/01/20	Lecture interspersed with discussions
41	Master cylinder, wheel cylinder & tandem master cylinder	03/02/20	
42	Requirement of brake fluid brakes	04/02/20	
43	Pneumatic & vacuum brakes	05/02/20	
44	**Electrical system**		
45	Electrical system & types of circuits	05/02/20	
46	Charging circuit, generator & current	06/02/20	
47	Voltage regulator & starting system	07/02/20	
48	Bendix drive mechanism	10/02/20	
49	Solenoid switch & lighting system	11/02/20	
50	Horns, Wiper & Fuel guage	11/02/20	
51	Oil pressure guage	12/02/20	
52	Engine temperature indicator system	13/02/20	
UNIT-V ENGINE SPECIFICATION & SAFETY SYSTEMS			
CO5: Gain knowledge & become familiar with the Engine specification & their safety systems of an automobile			
TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN.			
	UNIT – 5 Engine specification & safety systems		
53	Engine specification & safety systems with regard to power	14/02/20	
54	Safety system with regard to speed, torque & no of cylinders	14/02/20	
55	Arrangement, lubrication & cooling	17/02/20	Lecture interspersed with discussions
56	Safety introduction & Types safety systems	19/02/20	
57	Seat belt construction	20/02/20	
58	Air bags types & Bumper	20/02/20	
59	Anti-lock braking systems (ABS)	24/02/20	
60	Wind shield	25/02/20	
61	Suspension sensors & traction control	26/02/20	
62	Mirrors & central locking	26/02/20	
63	effluents from power plants	27/02/20	
64	Electric windows	28/02/20	

65	Speed control in safety sytems	02/03/20	
UNIT-VI ENGINE EMISSION CONTROL & ENGINE SERVICE **CO6: Able to understand the Emissions of an engine & its control & servicing** **TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN.**			
	UNIT – 6 Engine emission control & service		Lecture interspersed with discussions
66	Engine emission control introduction	03/03/20	
67	Types of pollutants	04/03/20	
68	Mechanism of formation	05/03/20	
69	Concentration measurement	06/03/20	
70	Methods of controlling engine modification	09/03/20	
71	Exhaust gas treatment	10/03/20	
72	Thermal & Catalytic convertors	10/03/20	
73	Use of alternative fuels for Emission control	11/03/20	
74	National & International pollution standards	11/03/20	
75	Engine Service introduction	12/03/20	
76	Service details of engine cylinder head	13/03/20	
77	Valves & Valve Mechanism	13/03/20	
78	Piston connecting rod assembly	16/03/20	
79	Cylinder block & crankshaft	17/03/20	
80	Main bearings service	18/03/20	
81	Engine re-assembly precautions	19/03/20	

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TENTATIVE LESSON PLAN: R164203B
NON-DESTRUCTIVE EVALUATION

Course Title: NON-DESTRUCTIVE EVALUATION		
Section : Sec A	**Date : 15/11/2019**	**Page No :** 01 of 03
Revision No : 00	**Prepared By: P. Bhagya lakshmi**	**Approved By : HOD**

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION TO NON-DESTRUCTIVE TESTING **CO1:** Able to understand the principle of radiographic technique, sources of radiographic rays, equipment & different techniques of radiography **TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair**			
1	Introduction to non-destructive testing, Applications	18/11/19	Lecture interspersed with discussions
2	**Radiographic test**: principle	19/11/19	
3	Advantages, dis- advantages & applications	20/11/19	
4	Sources of X rays	21/11/19	
5	Sources of Gamma Rays	22/11/19	
6	Properties of x & gamma rays and differences	25/11/19	
7	Interaction of X and Gamma rays with Matter	26/11/19	
8	Radiographic equipment	27/11/19	
9	Radiographic Techniques	28/11/19	
10	Safety Aspects of Industrial Radiography	29/11/19	
UNIT-II ULTRASONIC TEST **CO2:**Able to understand the ultrasonic test, ultrasonic transducers & their characteristics, interpretation of defects, effectiveness & limitations of testing. **TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair**			
11	**Ultrasonics test:** Introduction	2/12/19	Lecture interspersed with discussions
12	Principle of Wave Propagation	3/12/19	
13	Reflection, Refraction, Diffraction	4/12/19	
14	Mode Conversion, Attenuation	5/12/19	
15	Sound Field, Piezo-electric Effect	6/12/19	
16	Ultrasonic Transducers and their Characteristics	10/12/19	
17	Ultrasonic Equipment	11/12/19	
18	Variables Affecting Ultrasonic Test	12/12/19	
19	Methods of testing	13/12/19	
20	Interpretations	16/12/19	
21	Guidelines for Acceptance, Rejection	17/12/19	
22	Ultrasonic Testing, and	18/12/19	

23	Effectiveness and Limitations of Ultrasonic Testing.	19/12/19	
UNIT-III LIQUID PENETRANT TEST & EDDY CURRENT TEST **CO3:** Able to understand the concept of liquid penetrant test & eddy current test, test procedure & its applications. **TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair**			
24	**Liquid Penetrant Test:** Liquid Penetrant Test, Basic Concepts	20/12/19	Lecture interspersed with discussions
25	Principle of LPT	23/12/19	
26	Liquid Penetrant System	24/12/19	
27	Test Procedure	26/12/19	
28	Test Procedure	27/12/19	
29	Effectiveness and Limitations of Liquid Penetrant Testing	30/12/19	
30	**Eddy Current Test:** Principle of Eddy Current testing	31/12/19	
31	Eddy Current Test System	2/1/20	
32	Applications of Eddy Current Testing	3/1/20	
33	Effectiveness of Eddy Current Testing	6/1/20	
34	Limitations of Eddy Current Testing	7/1/20	
UNIT-IV MAGNETIC PARTICLE TEST **CO4:** Able to understand the concept of Magnetic particle test, test procedure & to interpret the various surface & sub-surface flaws **TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair**			
35	**Magnetic Particle Test:** Magnetic Materials,	8/1/20	Lecture interspersed with discussions
36	Magnetization of Materials	9/1/20	
37	Demagnetization of Materials	10/1/20	
38	Principle of Magnetic Particle Test	27/1/20	
39	Magnetic Particle Test Equipment	28/1/20	
40	Magnetic Particle Test Procedure	29/1/20	
41	Standardization and Calibration	30/1/20	
42	Interpretation and Evaluation	31/1/20	
43	Effective and Limitations of the Magnetic Particle Test.	3/2/20	
UNIT-V INFRARED AND THERMAL TESTING **CO5:** Able to understand the fundamentals to infrared & thermal testing, contact & non-contact thermal inspection methods, infrared detectors,thermo mechanical behavior of materials–IR imaging in aerospace applications, electronic components, Honey comb and sandwich structures. **TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair** **Non-Destructive testing of materials- Dr. V. Jayakumar & Dr. K. Elangovan**			
44	**Infrared And Thermal Testing** Introduction and fundamentals to infrared and thermal testing	4/2/20	
45	Heat transfer	5/2/20	

46	Active and passive techniques	6/2/20	Lecture interspersed with discussions
47	Lock in and pulse thermography	7/2/20	
48	Contact thermal inspection methods	10/2/20	
49	Non -contact thermal inspection methods	11/2/20	
50	Heat sensitive paints –Heat sensitive papers	12/2/20	
51	thermally quenched phosphors liquid crystals	13/2/20	
52	techniques for applying liquid crystals	14/2/20	
53	other temperature sensitive coatings	17/2/20	
54	Infrared radiation and infrared detectors	18/2/20	
55	thermo mechanical behavior of materials	19/2/20	
56	IR imaging in aerospace applications	20/2/20	
57	electronic components	24/2/20	
58	Honey comb and sandwich structures	25/2/20	
59	Casestudies.	26/2/20	
UNIT-VI INDUSTRIAL APPLICATIONS OF NDE **CO6:** Able to understand and select the appropriate NDE method based on the application. **TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair**			
60	**Industrial Applications of NDE:** Span of NDE Activities Railways	27/2/20	Lecture interspersed with discussions
61	Nuclear	28/2/20	
62	Non-nuclear	2/3/20	
63	Chemical Industries	3/3/20	
64	Aircraft and Aerospace Industries	4/3/20	
65	, Automotive Industries,	5/3/20	
66	Offshore Gas and Petroleum Projects	6/3/20	
67	Coal Mining Industry,	9/3/20	
68	NDE of pressure vessels	11/3/20	
69	Castings, welded constructions.	12/3/20	
70	Revision	13/3/20	
71	Revision	16/3/20	
72	Revision	17/3/20	

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TENTATIVE LESSON PLAN: R164203B
NON-DESTRUCTIVE EVALUATION

Course Title: NON-DESTRUCTIVE EVALUATION		
Section : Sec B	**Date : 15/11/2019**	**Page No :** 01 of 03
Revision No : 00	**Prepared By: P.Bhagya lakshmi**	**Approved By : HOD**

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION TO NON-DESTRUCTIVE TESTING **CO1:** Able to understand the principle of radiographic technique, sources of radiographic rays, equipment & different techniques of radiography **TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair**			
1	Introduction to non-destructive testing Applications	18/11/19	Lecture interspersed with discussions
2	**Radiographic test**: principle	19/11/19	
3	Advantages, dis- advantages & applications	20/11/19	
4	Sources of X rays	21/11/19	
5	Sources of Gamma Rays	22/11/19	
6	Properties of x & gamma rays and differences	25/11/19	
7	Interaction of X and Gamma rays with Matter	26/11/19	
8	Radiographic equipment	27/11/19	
9	Radiographic Techniques	28/11/19	
10	Safety Aspects of Industrial Radiography	29/11/19	
UNIT-II ULTRASONIC TEST **CO2:**Able to understand the ultrasonic test, ultrasonic transducers & their characteristics, interpretation of defects, effectiveness & limitations of testing. **TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair**			
11	**Ultrasonics test:** Introduction	2/12/19	Lecture interspersed with discussions
12	Principle of Wave Propagation	3/12/19	
13	Reflection, Refraction, Diffraction	4/12/19	
14	Mode Conversion, Attenuation	5/12/19	
15	Sound Field, Piezo-electric Effect	6/12/19	
16	Ultrasonic Transducers and their Characteristics	10/12/19	
17	Ultrasonic Equipment	11/12/19	
18	Variables Affecting Ultrasonic Test	12/12/19	
19	Methods of testing	13/12/19	
20	Interpretations	16/12/19	
21	Guidelines for Acceptance, Rejection	17/12/19	
22	Ultrasonic Testing, and	18/12/19	

23	Effectiveness and Limitations of Ultrasonic Testing	19/12/19	
UNIT-III LIQUID PENETRANT TEST & EDDY CURRENT TEST **CO3:** Able to understand the concept of liquid penetrant test & eddy current test, test procedure & its applications. **TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair**			
24	**Liquid Penetrant Test:** Liquid Penetrant Test Basic Concepts	20/12/19	Lecture interspersed with discussions
25	Principle of LPT	23/12/19	
26	Liquid Penetrant System	24/12/19	
27	Test Procedure	26/12/19	
28	Test Procedure	27/12/19	
29	Effectiveness and Limitations of Liquid Penetrant Testing	30/12/19	
30	**Eddy Current Test:** Principle of Eddy Current testing	31/12/19	
31	Eddy Current Test System	2/1/20	
32	Applications of Eddy Current Testing	3/1/20	
33	Effectiveness of Eddy Current Testing	6/1/20	
34	Limitations of Eddy Current Testing	7/1/20	
UNIT-IV MAGNETIC PARTICLE TEST **CO4:** Able to understand the concept of Magnetic particle test, test procedure & to interpret the various surface & sub-surface flaws **TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair**			
35	**Magnetic Particle Test:** Magnetic Materials	8/1/20	Lecture interspersed with discussions
36	Magnetization of Materials	9/1/20	
37	Demagnetization of Materials	10/1/20	
38	Principle of Magnetic Particle Test	27/1/20	
39	Magnetic Particle Test Equipment	28/1/20	
40	Magnetic Particle Test Procedure	29/1/20	
41	Standardization and Calibration	30/1/20	
42	Interpretation and Evaluation	31/1/20	
43	Effective and Limitations of the Magnetic Particle Test.	3/2/20	
UNIT-V INFRARED AND THERMAL TESTING **CO5:** Able to understand the fundamentals to infrared & thermal testing, contact & non-contact thermal inspection methods, infrared detectors,thermo mechanical behavior of materials–IR imaging in aerospace applications, electronic components, Honey comb and sandwich structures. **TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair** **Non-Destructive testing of materials- Dr. V. Jayakumar & Dr. K. Elangovan**			
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