

Siruseri IT park, OMR, Chennai - 603103

<b>Evaluation method</b> Marks out of 10							
<b>UNIT III - MECHANICAL PROPERTIES</b>							
19	Tensile test, plastic deformation mechanisms	T2 / R4	1	PPT	L2	CO3	PO4
20	strengthening methods, refinement of the grain size	T2 / R4	1	PPT	L2	CO3	PO1, PO4
21	solid solution strengthening	T2 / R4	1	BB	L2	CO3	PO9
22	hardening,precipitation,martensite, dispersion	T2 / R4	1	BB	L3	CO3	PO9
23	creep resistance, curves, mechanisms of creep	T1 / R4	1	BB	L3	CO3	PO4
24	fracture, griffth criterion	T1 / R4	1	BB	L2	CO3	PO4
25	fatigue test, methods of increase fatigue life	T1 / R4	1	BB	L2	CO3	PO4
26	Rockwell and Brinell hardness	T2 / R4	1	PPT	L3	CO3	PO9
27	Knoop and Vickers microhardness	T2 / R4	1	BB	L3	CO3	PO9, PO12
<b>Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any</b> Assignment							
<b>Evaluation method</b> Marks out of 10							
<b>UNIT IV - MAGNETIC, DIELECTRIC AND SUPERCONDUCTING MATERIALS</b>							
28	Ferromagnetism: Origin and exchange interaction, saturation magnetization and curie temperature	T1 / R4	1	BB	L1	CO4	PO4
29	Domain theory of Ferromagnetism	T1 / R4	1	BB	L3	CO4	PO4
30	Hysteresis of M Vs H behavior	T1 / R4	1	BB	L3	CO4	PO4
31	Dielectric materials, polarisation process	T1 / R4	1	BB	L2	CO4	PO4
32	internal field, Clausius -Mosotti relation	T1 / R4	1	BB	L3	CO4	PO9
33	dielectric breakdown, dielectric loss, dielectric strength	T1 / R4	1	BB	L3	CO4	PO4
34	Superconducting materials	T2 / R4	1	BB	L2	CO4	PO9
35	Properties	T2 / R4	1	PPT	L2	CO4	PO9
36	problems	T1 / R4	1	BB	L3	CO4	PO2
<b>Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any</b> Assignment							
<b>Evaluation method</b> Marks out of 10							
<b>UNIT V - NEW MATERIALS</b>							
37	Ceramics- tyoes and applications	T3 / R3	1	PPT	L2	CO5	PO4
38	composites: classification, rolo of matrix and reinforcement	T3 / R3	1	PPT	L2	CO5	PO9
39	processing of fiber reinforced plastics	T3 / R3	1	PPT	L3	CO5	PO9
40	Metallic glasses: types	T3 / R3	1	PPT	L2	CO5	PO4
41	melt spining process, applications	T3 / R3	1	PPT	L3	CO5	PO9
42	shape memory alloys, shape memory effect, pseudoelastic effect	T3 / R3	1	PPT	L3	CO5	PO4
43	NiTi alloy, applications	T1 / R4	1	PPT	L3	CO5	PO9
44	Nanomaterials preparation, properties and applications	T1 / R4	1	PPT	L3	CO5	PO9
45	carbon nanotubes and its types	T1 / R4	1	PPT	L3	CO5	PO9
<b>Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any</b> Quiz							
<b>Evaluation method</b> Marks out of 10							
<b>Content Beyond the Syllabus Planned</b>							
1	COMPARISON OF DIA, PARA AND FERRO MAGNETISM						

2	BCS THEORY, COOPER PAIR													
Text Books														
1	Balasubramaniam.R, " Callister's Materials Science and Engineering", Wiley India Pvt. Ltd., 2014													
2	Raghavan.V. " Physical Metallurgy: Principles and Practice", PHI Learning, 2015													
3	Raghavan.V. " Materials Science and Engineering: A First course", PHI Learning, 2015													
Reference Books														
1	Askeland.D " Materials Science and Engineering " Brooks/Cole, 2010.													
2	Smith,W.F., Hashemi,J.Prakash,R," Materials Science and Engineering". Tata McGraw Hill Education Pvt.Ltd.,2014													
3	Wahab, M.A. —Solid State Physics: Structure and Properties of Materials. Narosa Publishing House, 2009.													
4	Senthil Kumar G. “ Material Science”, VRB Publications Pvt. Ltd, 2017													
Website / URL References														
1	<a href="https://www.youtube.com/watch?v=M4lDuktUael">shape memory alloys: https://www.youtube.com/watch?v=M4lDuktUael</a>													
2	<a href="https://www.youtube.com/watch?v=oULkYtYPgs">metallic glasses: types:https://www.youtube.com/watch?v=oULkYtYPgs</a> , <a href="https://www.youtube.com/watch?v=AZ3tQioo1DU">https://www.youtube.com/watch?v=AZ3tQioo1DU</a>													
3	<a href="https://www.youtube.com/watch?v=JL8qvTW-WCg">pulsed laser deposition: https://www.youtube.com/watch?v=JL8qvTW-WCg</a>													
4	<a href="https://youtu.be/aVvgEMhOYfo">Carbon Nanotube - https://youtu.be/aVvgEMhOYfo</a>													
5	<a href="https://www.youtube.com/watch?v=5A3vh84eq04">magnetic properties of solids - https://www.youtube.com/watch?v=5A3vh84eq04</a>													
Blooms Level														
Level 1 ( L1 ) : Remembering				Lower Order Thinking	Fixed Hour Exams	Level 4 (L4) : Analysing						Higher Order Thinking	Projects / Mini Projects	
Level 2 (L2) : Understanding						Level 5 (L5) : Evaluating								
Level 3 (L3) : Applying						Level 6 (L6) : Creating								
Mapping syllabus with Bloom's Taxonomy LOT and HOT														
Unit No	Unit Name				L1	L2	L3	L4	L5	L6	LOT	HOT	Total	
Unit 1	PHASE DIAGRAMS				1	4	4	0	0	0	9	0	9	
Unit 2	FERROUS ALLOYS				0	4	5	0	0	0	9	0	9	
Unit 3	MECHANICAL PROPERTIES				0	4	5	0	0	0	9	0	9	
Unit 4	MAGNETIC, DIELECTRIC AND SUPERCONDUCTING MATERIALS				1	3	5	0	0	0	9	0	9	
Unit 5	NEW MATERIALS				0	3	6	0	0	0	9	0	9	
Total				2	18	25	0	0	0	45	0	45		
Total Percentage				4.44	40.00	55.56	0.00	0.00	0.00	100.00	0.00	100.00		
CO PO Mapping														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	2	3	-	-	-	-	3	-	-	1	-	-
CO2	3	-	-	3	-	-	-	-	3	-	-	1	-	-
CO3	3	-	2	3	1	-	-	-	3	-	-	1	-	-
CO4	3	1	1	-	1	-	1	-	-	-	-	1	-	-
CO5	3	1	1	-	1	-	1	-	-	-	-	1	-	-
Avg	3	1	2	3	1	-	-	-	3	-	-	1	-	-
Justification for CO-PO mapping														
CO1	Applying the concepts of phase diagrams strongly (PO1). This will help in design and development of solutions for complex engineering problems (PO3). This will help in conduct investigations of complex problems to some extent (PO4). (PO9) gives the knowledge of individual and team work in engienering field weakly and (PO12) recognizes the need for life-long learning to some extent.													
CO2	Applying the concepts of ferrous alloys strongly (PO1). This will help in conduct investigations of complex problems to some extent (PO4). (PO9) gives the knowledge of individual and team work in engienering field weakly and (PO12) recognizes the need for life-long learning to some extent.													
CO3	Concepts of various mechanical properties of the materials to strong Engineering knowledge (PO1). This will help in design and development of solutions for complex engineering problems (PO3). This will help in conduct investigations of complex problems to some extent (PO4). Developing simple model helps to learn the techniques (PO5) weakly. (PO9) helps to understand the impact of individual and team work to some extent and PO12 recognizes the need for life-long learning weakly.													
CO4	Concepts of various magnetic materials, dielectric materials, superconducting materials and its breakdown attribute to strong Engineering knowledge (PO1). This will help in problem solving (PO2) as well as design and development of solution (PO3) to a greater extent. Developing simple model helps to learn the techniques (PO5) weakly. PO7 helps to understand the impact of magnetic and dielectric materials to environment to some extent and PO12 recognizes the need for life-long learning weakly.													

<b>CO5</b>	Understand the basics of quantum structures and their applications and carbon electronics attributes to strong Engineering knowledge (PO1). This will help in problem solving (PO2) as well as design and development of solution (PO3) to a greater extent. Selecting suitable algorithm helps in learning the commercial software (PO5) to some extent. PO7 gives the knowledge of engineering solutions in society and environment moderately. PO12 recognizes the need for life-long learning to some extent.				
<b>3</b>	<b>High level</b>	<b>2</b>	<b>Moderate level</b>	<b>1</b>	Low level
Name & Sign of Faculty Incharge :					
Name & Sign of Subject Expert :					
Head of the Department :					

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