

RAJA KISHORE CHANDRA ACADEMY OF TECHNOLOGY
NILGIRI, BALASORE
DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

SUBJECT- ENGINEERING MATERIALS

NAME OF THE FACULTY-ER.GAGAN KUMAR SINGH

SEMESTER-3RD
SESSION-

BRANCH – MECHANICAL

UNIT	DATE	LECTURE NO.	TOPIC TO BE COVERED
1		1	Material classification into ferrous category and alloys
		2	Material classification into non ferrous category and alloys
		3	Properties of Materials: Physical , Chemical 'Mechanical
		4	Performance requirements
		5	Material reliability and safety
		6	Doubt Clearing and question answer discussion
2		7	Characteristics and application of ferrous materials
		8	Classification, composition and application of low carbon steel, medium carbon steel and High carbon steel
		9	Alloy steel: Low alloy steel, high alloy steel, tool steel and stainless steel
		10	Tool steel: Effect of various alloying elements such as Cr, Mn,
		11	Tool steel: Effect of various alloying elements such as Ni, V, Mo
		12	Doubt Clearing and question answer Discussion
3		13	Concept of phase diagram
		14	Phase diagram
		15	Cooling curve
		16	Features of Iron-Carbon diagram with salient micro-constituents of Iron
		17	Features of Iron-Carbon diagram with salient micro-constituents of Steel
		18	Doubt Clearing, question discussion
4		19	Defines Crystal, classification of crystals, ideal crystal
		20	crystal imperfections
		21	Classification of imperfection: Point defects, line defects
		22	surface defects and volume defects
		23	Types and causes of line defects: Edge dislocation
		24	screw dislocation
		25	Doubt Clearing, question discussion
		26	Effect of imperfection on material properties
		27	Deformation by slip and twinning

		28	Effect of deformation on material properties
		29	Doubt Clearing, question discussion
5		30	Annealing Process
		31	Normalizing Process
		32	Purpose of heat treatment
		33	Hardening Process
		34	Tempering Process
		35	Process of heat treatment: stress relieving measures
		36	Surface hardening: Carburizing
		37	Surface hardening: Nitriding
		38	Effect of heat treatment on properties of steel
		39	Hardenability of steel
		40	Doubt Clearing, question discussion
6		41	Aluminium alloys: Composition, property and usage of Duralmin,
		42	Aluminium alloys: Composition, property and usage of y alloy
		43	Copper alloys: Composition, property and usage of Copper- Aluminium, Copper-Tin
		44	Copper alloys: Composition, property and usage, Babbit , Phosperous bronze,
		45	Copper alloys: Composition, property and usage of brass, Copper- Nickel
		46	Predominating elements of lead alloys, Zinc alloys
		47	Predominating elements of Nickel alloys
		48	Low alloy materials like P-91, P-22 for power plants and other high temperature services. High alloy materials like stainless steel grades of duplex, super duplex materials
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		50	Doubt Clearing, question discussion
7		51	Classification, composition of Copper base, Tin Base, Lead base, Cadmium base bearing materials
		52	properties and uses of Copper base, Tin Base, Lead base, Cadmium base bearing materials
		53	
8		54	Copper alloys: Composition, property and usage of Copper- Aluminium, Copper-Tin
		55	Copper alloys: Composition, property and usage, Babbit , Phosperous bronze,
		56	Copper alloys: Composition, property and usage of brass, Copper- Nickel
9		57	Predominating elements of lead alloys, Zinc alloys

		58	Copper alloys: Composition, property and usage of Copper- Aluminium, Copper-Tin
		59	Doubt Clearing, question discussion
10		60	Classification, composition, properties and uses of based fiber reinforced composites
		61	Classification, composition, properties and uses of fiber rein forced composites
		63	Classification and uses of ceramics
		64	Doubt Clearing, question discussion
		65	Properties of Materials: Physical , Chemical 'Mechanical
		66	Classification, composition and application of low carbon steel, medium carbon steel and High carbon steel
		67	Tool steel: Effect of various alloying elements such as Cr, Mn, Tool steel: Effect of various alloying elements such as Ni, V, Mo
		68	Features of Iron-Carbon diagram with salient micro-constituents of Iron
		69	Surface defects and volume defects Types and causes of line defects: Edge dislocation screw dislocation
		70	Annealing Process Normalizing Process Purpose of heat treatment Hardening Process Tempering Process Process of heat treatment: stress relieving measures Surface hardening: Carburizing Surface hardening: Nitriding
		71	Aluminium alloys: Composition, property and usage of Duralmin,
		72	Copper alloys: Composition, property and usage of Copper- Aluminium, Copper-Tin
		73	Copper alloys: Composition, property and usage, Babbitt , Phosperous bronze,
		74	Copper alloys: Composition, property and usage of brass, Copper- Nickel
		75	Predominating elements of lead alloys, Zinc alloys
		76	Copper alloys: Composition, property and usage of Copper- Aluminium, Copper-Tin Copper alloys: Composition, property and usage, Babbitt , Phosperous bronze, Copper alloys: Composition, property and usage of brass, Copper- Nickel Predominating elements of lead alloys, Zinc alloys
		77	Effect of imperfection on material properties

		78	Classification, composition, properties and uses of based fiber reinforced composites
		79	Classification, composition, properties and uses of fiber rein forced composites
		80	Classification and uses of ceramics
SIGNATURE OF FACULTY MEMBER SIGNATURE OF H.O.D			