No.	Information on Every Subject	
1.	Unit Name:	Principle of Physical Metallurgy I
2.	Unit Code:	Met-41033
3.	Classification:	Engineering Subject
4.	Credit Value:	2
5.	Semester/Year Offered:	1/2
6.	Pre – requisite:	
7.	Mode of Delivery:	Lecture,Tutorial, Practical
8.	Assessment System and Breakdown of Marks:	
	Test, Assignment	15%,15%
	Mid – term/Final Examination	70%
9.	Academic Staff Teaching Unit:	Professor
10.	Course outcome of unit: In this course, students will • understand the analysis of the concept of processing-structure-properties of materials, the properties of materials and their applications based on the properties. • show a systematic understanding of the role that crystal structures play in material properties. • identify the phases in metals and alloys and phase diagram of binary alloys. • understand about the formation of different phases in iron carbon equilibrium diagram. • distinguish different types of ferrous and non-ferrous alloys with reference to composition, microstructure, properties, and applications.	
11.	Synopsis of unit: The subject deals with methods for studying crystal structures, imperfections in crystal structures, phases in metal systems, equilibrium diagram, phase transformations, phase diagrams, intermediate phases, solid-state reactions and the iron-carbon system and typical industrially important equilibrium diagrams.	
12.	Topic 1.A survey of metallurgy -The study of metallurgy -Extractive metallurgy -Metal forming methods -Casting -Working 2.Structure of metals -Binding in solids -Space lattices and crystal systems -Imperfections in crystal structures -Solid phases Phase transformations	

	3. Metallography -Optical microscopy -X ray metallogrophy -Macrostructure 4.Phase diagrams -Solid solution systems -Eutectic systems -Peritectic systems -Nonequlibrium solidification -Intermediate phases -Solid state reactions -Ternary systems 5.Applications of phase diagrams -The iron carbon system -Irons -Steels -Cast irons -Properties of iron carbon alloys
13.	Main references: Elements of Physical Metallurgy, Albert G.Guy
14.	Additional reference: The Science and Engineering of Materials, Six Edition, Donald R. Askeland

List of Practical

Lab	Activity	Contact Hours
1	Topic: Microstructural Analysis of Gray Cast Iron	5
2	Topic: Microstructural Analysis of Ductile Cast Iron	5
3	Topic: Microstructural Analysis of Steel	5