

# ENGINEERING MATERIAL

## LIST OF MONTH WISE AVAILABLE DAYS/PERIODS

Month	July	Aug	Sept.	Oct	TOTAL
Month Wise No. of Academic Days Available	15	21	18	17	71
Month Wise No. of Academic Periods Available					

## TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Periods as per Syllabus	No of periods actually needed	Expected marks
1	Engg.Materials and their properties.	05	07	05
2	Ferrous materials and alloys	05	05	10
3	Iron-Carbon system	08	11	15
4	Crystal imperfections	10	10	12
5	Heat Treatment	10	11	15
6	Non-ferrous alloys	10	10	15
7	Bearing Material	03	04	10
8	Spring materials	03	03	10
9	Polymers	03	03	10
10	Composites and Ceramics	03	04	10
	<b>TOTAL</b>	<b>60</b>	<b>68</b>	<b>100</b>

Signature of  
Lecturer

Signature of  
HOD I/c

Signature of  
Academic I/c

Signature of  
V.P

## Material classification

Article No.	Name of the Article	Periods Needed	Lect. Sign With Date	Authenticity duly verified by H.O.D.	Sign. of V.P.
1.1	Definition of material. Material classification into ferrous and nonferrous category and alloys	01			
	Cont.	01			
1.2	Understand factors affecting the selection of materials for engineering purposes. Properties of Materials	01			
	Physical Properties of Materials	01			
	chemical and mechanical properties of materials	01			
1.3	Performance requirements	01			
1.4	Material reliability and safety	01			
	<b>TOTAL</b>	07			
	<i>Short Questions with Answer and Long Questions with Hints</i>				

## Chapter 2.0 Ferrous material and alloys

Article No.	Name of the Article	Periods Needed	Lect. Sign With Date	Authenticity duly verified by H.O.D.	Sign. of V.P.
2.1	Characteristics and application of ferrous materials	01			
2.2	Classification, composition and application of low carbon steel, medium carbon steel and High carbon steel	01			
2.3	Alloy steel: Low alloy steel, high alloy steel, tool steel and stainless steel	01			
2.4	Tool steel: Effect of various alloying elements such as Cr, Mn, Ni, V, Mo	01			
	<b>TOTAL</b>	04			
	<i>Short Questions with Answer and Long Questions with Hints</i>				

## Chapter 3.0 Iron-Carbon system

Article No.	Name of the Article	Periods Needed	Lect. Sign With Date	Authenticity duly verified by H.O.D.	Sign. of V.P.
3.1	Concept of phase diagram	01			
	Concept of Cooling curve	01			
	Construction of Iron-Carbon equilibrium diagram with salient micro-constituents. Of iron and steel.	01			
	Explanation with microstructure of various micro constituents	01			
3.2	(a) austenite	01			
	(b) ferrite	01			
	(c) cementite	01			
	(d) ledeburite	01			
	(f) bainite	01			
	(g) martensite	01			
	(h) troostite, sorbite	01			
	<b>TOTAL</b>	11			
	<i>Short Questions With Answer and Long Questions With Hints</i>				

## Chapter 4.0 Crystal imperfections

Article No.	Name of the Article	Periods Needed	Lect. Sign With Date	Authenticity duly verified by H.O.D.	Sign. of V.P.
4.1	Crystal defines, classification of crystals, ideal crystal and crystal imperfections	01			
4.2	Classification of imperfection: Point defects, line defects,	01			
	surface defects and volume defects	01			
4.3	Types and causes of point defects: Vacancies, Interstitials and impurities	01			
	Types and causes of point defects: Vacancies, Interstitials and impurities	01			
4.4	Types and causes of line defects: Edge dislocation and screw dislocation	01			

4.5	Effect of imperfection on material properties	01			
	Effect of imperfection on material properties	01			
4.6	Deformation by slip and twinning	01			
4.7	Effect of deformation on material properties	01			
	<b>TOTAL</b>	10			
	<i>Short Questions With Answer and Long Questions With Hints</i>				

## Chapter 5.0 Heat Treatment

Article No.	Name of the Article	Periods Needed	Lect. Sign With Date	Authenticity duly verified by H.O.D.	Sign. of V.P.
5.0	Definition ,Classification of heat treatment	01			
5.1	Purpose of heat treatment	01			
5.2	Process of heat treatment and the methods, Anneling	01			
	Normalizing	01			
	Hardening, Surface hardening	01			
	Tempering	01			
	Stress relieving measures.	01			
	Age hardening	01			
	Surface hardening,carborising, Nitriding	01			
5.3	Effect of heat treatment on the properties of steel	01			
5.4	Harden ability of steel	01			
	<b>TOTAL</b>	11			
	<i>Short Questions With Answer and Long Questions With Hints</i>				

## Chapter6.0 Nonferrous alloys

Article No.	Name of the Article	Periods Needed	Lect. Sign With Date	Authenticity duly verified by H.O.D.	Sign. of V.P.
6.1	Describe composition, properties and uses of Aluminum alloys duralumin, Y-alloy	01			
	Copper alloys such as copper-aluminum, copper-tin-antimony	01			
6.2	copper-tin-phosphorous, copper-zinc, copper-nickel	01			
6.3	Predominating elements of lead alloys	01			
6.4	Predominating elements of zinc alloys	01			
6.5	Predominating elements of nickel alloys	01			
6.6	Low alloy materials like P-91, P-22 for power plants and other high temperature services	01			
	High alloy materials like stainless steel grades of duplex, super duplex materials etc	01			
	<b>TOTAL</b>	08			
	<i>Short Questions With Answer and Long Questions With Hints</i>				

## Chapter 7.0 Bearing material

Article No.	Name of the Article	Periods Needed	Lect. Sign With Date	Authenticity duly verified by H.O.D.	Sign. of V.P.
7.1	Classification of bearing material	01			
	Describe composition ,properties & uses of tin-base bearing metals	01			
7.2	copper-base bearing metal,	01			
7.3	Lead-base bearing metal and cadmium-base bearing metal	01			
	<b>TOTAL</b>	04			
	<i>Short Questions With Answer and Long Questions With Hints</i>				



