

## Lesson Plan

Name of Institute	: Ambala College of Engineering and Applied Research
Name of the Faculty member	: Er. Gurpinder Singh
Discipline	: Mechanical Engineering
Semester	: 8 <sup>th</sup>
Subject	: Foundry Engineering
Lesson Plan Duration	: 15 weeks (from February 2021 to May 2021)
Work Load	: L-4 T-0 P-0

Week	<b>Theory</b>	
	Lecture day	Topic (including assignment/ test)
1 <sup>st</sup>	1 <sup>st</sup>	Introduction to metal casting and foundry industry in modern industrial scenario.
	2 <sup>nd</sup>	Advantages and limitations of casting methods. Classification of foundries.
	3 <sup>rd</sup>	Different sections in a foundry and their functions.
	4 <sup>th</sup>	Revision of discussed Topics
2 <sup>nd</sup>	1 <sup>st</sup>	Important cast metals and alloys-their composition, properties and uses.
	2 <sup>nd</sup>	Types of patterns
	3 <sup>rd</sup>	Brief classification of pattern making materials
	4 <sup>th</sup>	Revision of discussed Topics
3 <sup>rd</sup>	1 <sup>st</sup>	Consideration in selection of pattern materials
	2 <sup>nd</sup>	Color coding, pattern allowances
	3 <sup>rd</sup>	Core boxes
	4 <sup>th</sup>	Types of core boxes.
4 <sup>th</sup>	1 <sup>st</sup>	Introduction of Moulding and core making
	2 <sup>nd</sup>	Ingredients of common type of moulding and core making sands
	3 <sup>rd</sup>	Properties and behavior of sand
	4 <sup>th</sup>	Revision of discussed Topics
5 <sup>th</sup>	1 <sup>st</sup>	Testing of sands and clay
	2 <sup>nd</sup>	Classification of molding processes and casting processes
	3 <sup>rd</sup>	Brief description of all processes.
	4 <sup>th</sup>	Class Test – 1 ( Syllabus will be notified )
6 <sup>th</sup>	1 <sup>st</sup>	Green sand dry sand, loam sand floor
	2 <sup>nd</sup>	Pit and machine molding
	3 <sup>rd</sup>	<b>Casting processes</b>
	4 <sup>th</sup>	Revision of discussed Topics
7 <sup>th</sup>	1 <sup>st</sup>	Shell molding, CO <sub>2</sub> silicate process
	2 <sup>nd</sup>	Investment casting process

	3 <sup>rd</sup>	Permanent moulding process
	4 <sup>th</sup>	Revision of discussed Topics
8 <sup>th</sup>	1 <sup>st</sup>	Gravity die casting
	2 <sup>nd</sup>	Pressure die casting
	3 <sup>rd</sup>	Centrifugal casting process
	4 <sup>th</sup>	Problems & Assignment
9 <sup>th</sup>	1 <sup>st</sup>	Introduction of Elements of Gating system
	2 <sup>nd</sup>	Classification, basic consideration in gating design
	3 <sup>rd</sup>	Gating ratio
	4 <sup>th</sup>	Revision of discussed Topics
10 <sup>th</sup>	1 <sup>st</sup>	Gating practice for ferrous and nonferrous alloys
	2 <sup>nd</sup>	Pouring equipment.
	3 <sup>rd</sup>	Risering Practice
	4 <sup>th</sup>	Class Test – 1 (Syllabus will be notified)
11 <sup>th</sup>	1 <sup>st</sup>	Function of riser
	2 <sup>nd</sup>	Directional and progressive solidification
	3 <sup>rd</sup>	Centerline feeding resistance
	4 <sup>th</sup>	Riser efficiency
12 <sup>th</sup>	1 <sup>st</sup>	Riser design consideration
	2 <sup>nd</sup>	Risering curves, Cain's, N.R.L
	3 <sup>rd</sup>	Modulus method, feeding distance feeding aids, blind and atmospheric risers.
	4 <sup>th</sup>	Problems & Assignment
13 <sup>th</sup>	1 <sup>st</sup>	Melting of cast iron, Mechanical features of cupola
	2 <sup>nd</sup>	Operational steps and principles of cupola operation
	3 <sup>rd</sup>	Advanced practices in the cupola operation,
	4 <sup>th</sup>	Revision of discussed Topics
14 <sup>th</sup>	1 <sup>st</sup>	Melting of aluminum and copper based alloys
	2 <sup>nd</sup>	Mold treatments such as dressing, grain refining, and modification.
	3 <sup>rd</sup>	Casting defects
	4 <sup>th</sup>	Problems & Assignment
15 <sup>th</sup>	1 <sup>st</sup>	Causes and remedies
	2 <sup>nd</sup>	Shop floor quality control tests such as composition control
	3 <sup>rd</sup>	Casting Modification by different methods like Friction stir processing.
	4 <sup>th</sup>	Class Test – 1 ( Syllabus will be notified )

(Signature of the teacher concerned with date)