

GOVT POLYTECHNIC MAYURBHANJ, TIKARPADA
LESSON PLAN OF MANUFACTURING OF STEEL & STAINLESS-STEEL ACADEMIC YEAR (2026-2027) WINTER

DISCIPLINE: METALLURGY ENGINEERING		SEMESTER: 5TH	NAME OF THE TEACHING FACULTY: ROHIT KUMAR ROUT
SUBJECT: MANUFACTURING OF STEEL & STAINLESS STEEL, COURSE CODE: MTPC301		NO OF DAYS/PER WEEK CLASS ALLOTTED:03	SEMESTER FROM DATE:01.07.2026, TO DATE:05.11.2026, NO OF WEEKS: 16
WEEK	CLASS NO	UNITS	LECTURE TOPICS
1	1	CHAPTER -1 FUNDAMENTALS OF STEELMAKING	Definition and objectives of steelmaking, Role of carbon and impurities (Si, Mn, P, S, O, N), Acid and basic steelmaking processes,
	2		Raw materials: hot metal, scrap, fluxes
	3		Basic thermodynamics and kinetics of steelmaking reactions, Conditions for removal of Si, P, S, Mn, and C,
2	4		Overview of steel grades and their composition, Brief study of obsolete processes
	5		Bessemer process and Open-Hearth process (with limitations)
	6		ACID AND BASIC STEELMAKING PROCESSES
3	7		REVISION
	8		GROUP DISCUSSION
	9		DOUBT CLEARING CLASS
4	10	CHAPTER -2 PRIMARY STEELMAKING PROCESSES STEEL MAKING BY LD CONVERTER	SURPRISE TEST
	11		RAW MATERIALS OF LD PROCESS, CONSTRUCTION AND OPERATION OF LD CONVERTER
5	12		EMULSION AND REFINING REACTIONS IN LD CONVERTER AND SEQUENCE OF ELIMINATION OF IMPURITY.
	14		MN HUMP, QUALITY OF STEEL AND COMPOSITION OF SLAG IN LD PROCESS
	15		ADVANTAGES AND LIMITATIONS OF LD PROCESS, IMPORTANCE OF LANCE HEIGHT, DEVELOPMENTS IN LD PROCESS
6	16		OTHER STEEL MAKING PROCESSES: WORKING PRINCIPLE, PROCESS, ADVANTAGE AND LIMITATIONS OF
	17		OLP PROCESS, OBM PROCESS.
	18		DE-OXIDATION PRACTICE: DE-OXIDISERS AND THEIR USE, KILLED, SEMI KILLED AND RIMMING STEEL
7	19		GROUP DISCUSSION
	20		DOUBT CLEARING CLASS
	21		SURPRISE TEST
8	22		IMPORTANCE OF LANCE HEIGHT, DEVELOPMENTS IN LD PROCESS
	23		RAW MATERIALS OF LD PROCESS, CONSTRUCTION AND OPERATION OF LD CONVERTER
	24		OTHER STEEL MAKING PROCESSES: WORKING PRINCIPLE, PROCESS, ADVANTAGE AND LIMITATIONS OF
9	25		OLP PROCESS, OBM PROCESS.
	26		REVISION
	27		DOUBT CLEARING CLASS
10	28		REVISION

	29	CHAPTER -3 STAINLESS STEEL MANUFACTURING INTRODUCTION TO STAINLESS STEELS	DEFINITION AND ROLE OF CHROMIUM (PASSIVATION), CLASSIFICATION: AUSTENITIC, FERRITIC, MARTENSITIC, DUPLEX, PRECIPITATION HARDENING, PROPERTIES AND APPLICATIONS
	30		STAINLESS STEEL MAKING (PRIMARY PROCESSES): RAW MATERIALS FOR STAINLESS STEEL MAKING, ELECTRIC ARC FURNACE: PRINCIPLE, TYPES OF SLAGS PREPARED BY ELECTRIC ARC FURNACE, STEPS OF ELECTRIC ARC FURNACE HEATING TO PRODUCE STAINLESS STEEL
11	31		ADVANTAGES OF ELECTRIC ARC FURNACE PROCESS, INDUCTION FURNACE: PRINCIPLE AND PROCESS OF INDUCTION FURNACE, ADVANTAGES AND LIMITATIONS OF INDUCTION FURNACE PROCESS
	32		SECONDARY STEEL MAKING PROCESS: OBJECTIVES OF SECONDARY STEEL MAKING, PRINCIPLE OF OPERATION AND ADVANTAGES OF SECONDARY STEEL MAKING PROCESSES SUCH AS: LHF PROCESS
	33		VOD PROCESS, AOD PROCESS AND RH- OB DEGASSING PROCESS,
12	34		INCLUSION CONTROL AND CLEAN LHF PROCESS, VAD PROCESS AND RH- OB DEGASSING PROCESS,
	35		INCLUSION CONTROL AND CLEAN STEEL PRODUCTION, PROCESS CONTROL AND AUTOMATION IN SECONDARY STEELMAKING,
	36	CHAPTER -4 STING, DEFECTS & GREEN STEEL PIT SIDE PRACTICE	STAINLESS STEEL GRADES AND THEIR INDUSTRIAL SELECTION CRITERIA.
13	37		REVISION
	38		GROUP DISCUSSION
	39		CASTING, DEFECTS & GREEN STEEL
14	40		REVISION
	41		PIT SIDE PRACTICE: TEEMING METHODS SUCH AS: DIRECT POURING
	42		DOUBT CLEARING CLASS
15	43		TYPES OF CASTERS, ADVANTAGES OF CONTINUOUS CASTING, PRODUCTS OF CONTINUOUS CASTING
	44		CONTINUOUS CASTING OF STEEL: PRINCIPLE AND OPERATION OF CONTINUOUS CASTING,
	45		GREEN STEEL TECHNOLOGY: BRIEF IDEA ON GREEN STEEL, ITS ADVANTAGES, SUSTAINABLE PRACTICES IN STEEL INDUSTRY, BASIC IDEA ABOUT EMISSIONS AND EFFLUENT TREATMENT
16	46		BASIC IDEA ABOUT WASTE HEAT RECOVERY AND BY- PRODUCT UTILIZATION
	47		GROUP DISCUSSION
	48		REVISION


15/7/2026

Rohit Kumar Raut


15/07/2026