OPEN ELECTIVE COURSES OFFERED TO OTHER DEPARTMENTS

18MTOE01	FOUNDRY AND WELDING TECHNOLOGY	L	T	P	C
		3	0	0	3

Course Objectives:

1.	To know the basic concepts of metal casting technology and to apply them to produce of new materials
2.	To know the concepts of different materials joining technology and emphasis on underlying science and engineering principle of every processes.

UNIT I	MOULDING MATERIALS AND PATTERNS	9	+	0

Introduction to foundry operations, patterns - functions, types, allowances, selection of pattern materials, colour codes, core boxes, moulding practice, ingredients of moulding sand and core sand, Testing of Moulding sands. Sand preparation,. Sand reclamation in foundries

UNIT II	MOULDING AND CASTING TECHNIQUES	9	+	0

Sand moulding: green sand moulding, dry sand moulding, skin dry sand moulding, shell moulding, carbon-di-oxide process, permanent mould casting, die casting, centrifugal casting, , investment casting, squeeze casting, full mould process,Rheocasting,Thixo casting.

UNIT III	MELTING PRACTICE	9	+	0

Melting practice and special precautions for steels, alloy steels, cast irons, aluminium alloys, copper alloys and magnesium alloys, Cleaning and repair of castings. Casting defects and remedies

UNIT IV	WELDING AND OTHER JOINING PROCESSES	9	+	0

Classification of welding processes- oxy-acetylene welding, arc welding-manual, submerged arc welding, gas tungsten arc and gas metal arc welding, electro slag and electro gas welding.Brazing, soldering and cutting processes

UNIT V	SPECIAL WELDING PROCESSES	9	+	0

Principle, equipment, process variables, merits, limitations and applications of Electron beam, plasma arc and laser beam welding processes. friction, friction stir welding, ultrasonic explosive and diffusion welding.

Total (45+0) = 45 Hours

Course Outcomes:

Upon completion of this course, the students will be able to:

CO1	:	Discuss the alloying element effect on the steels and mention the precaution to be taken in moulding and melting of steels
CO2	:	Mention the melting procedure that is adopted for the various alloys like steels, stainless steels,

		discuss the slag-metal reactions
CO3	:	Understand and describe the gas and arc Welding processes such as Fusion welding process, Arc welding-manual process and Gas metal arc welding etc… and their heat sources
CO4	:	Describe the Brazing, Soldering and cutting processes and their advantages, limitations and applications
CO5	:	Explain the pressure welding processes such as cold, hot pressure welding, friction, friction stir welding processes, and special welding process such as Electron beam, plasma arc and laser beam welding.

Text Books:	
1.	Heine R W., Loper, C.R.Rosenthal, P.C.,"Principles of Metal Casting",Tata-McGraw Hill Publishing Co Ltd, New Delhi, 2008.
2.	Srinivasan N K.,"Foundry Engineering", Khanna Tech Publications, New Delhi, 2005.
3.	Parmar, R.S., “Welding Processes and Technology”, 2nd edn. Khanna Publishers, New Delhi, 2001
4.	Srinivasan N K ,"Welding Technology", Khanna Publications, Delhi, 2000
Reference Books:	
1.	Beeley P R.,"Foundry Technology", Butterworths, London, 1982.
2.	Howard B. Cary, "Modern Welding Technology", Prentice Hall, New Jersey, USA, 1998.