ANNEXURE A4

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY
DESIGN AND MANUFACTURING (IIITD&M) KANCHEEPURAM

Course Title	LASERs in Manufacturing	Course No	To be filled by the office		
Specialization	Mechanical engineering	Structure (IPC)	3	0	3
Offered for	UG and PG	Status (Core / Elective)	Elective		
Prerequisite	Engineering electromagnetics	To take effect from	January 2018		
Course Objectives	This course introduces the students about basics of optics and lasers with their applications in manufacturing. Students will learn several manufacturing techniques in terms of laser characteristics. It also introduces the laser safely which is required for laser industry aspirants.				
Course Outcomes	At the end of the course, the students will learn about Basics of optics and Lasers, how to apply these in manufacturing, Different laser based manufacturing techniques in terms of laser characteristics Also learn the laser safety in industry perspective				
Contents of the course	1. **Introduction to Optics and LASERs** (16) 2. **LASER Power delivery** (10) Optics performance at high optical powers, Adaptive optics for high peak power lasers, Fiber optics for remote delivery of high power pulsed laser beams, Beam path conditioning for high-power laser systems, Optical system for high power laser sintering. 3. **LASER based manufacturing techniques** (10) Laser Rapid Manufacturing: Technology, Applications, Modeling and Future Prospects, Lasers in Metal Forming Applications, Laser Forming of Metal Foams, Mathematical Modeling of Laser Drilling, Laser Cutting a Small Diameter Hole: Thermal Stress Analysis, Modeling and Simulation of Laser Welding, Lasers in Surface Engineering, welding, Laser Micromachining. 4. **LASER Safety** (4)				
Textbook	1. Gabriel Laufer, **Introduction to Optics and Lasers in Engineering**, Cambridge University Press, 2005. 2. J. Paulo Davim, **Lasers in Manufacturing,** Wiley, 2012.				
References	Journal: Lasers in Manufacturing and Materials Processing				