	National University of Sciences and Technology	
	Course Description	
Course Title Lase Material Processing	**Course Code** **DME 822**	**Credit Hours** **3 – 0**

Textbook:

- Laser Material Processing (Fourth Edition) By Willian M Steen and J Mazumder.

Reference Books:

- Introduction to Laser Technology (Fourth Edition) By C. Breck Hitz, J. Ewing and Jeff Hecht
- Laser Precision Microfabrication By Koji Sugioka, Michel Meunier and Alberto Pique
- "LIA Handbook of Laser Materials Processing" By John F. Ready (Editor)
- "Powder Metallurgy Technology" By G. S. Upadhyaya

Course Objective:

- The course is intended to give a thorough understanding of the basic working of lasers and their role in modern manufacturing technologies. The principles of operation of different types of industrial lasers are explained in detail with advantages and disadvantages. Emphasis is given to application of lasers in different manufacturing operations such as cutting welding etc. Powder Metallurgy and laser manufacturing of products from powder material is also explained in detail. Areas of future research are identified.

Course Outline:

- Basic Laser optics, Types of Industrial Lasers, Laser Beam Parameters, Powder Metallurgy and Powder Material Characteristics, Metal Powder Characteristics, Metal Powder Compaction, Powder Injection Molding, Laser Material Interaction, Rapid Manufacturing and Laser Manufacturing, Rapid Manufacturing Processes, Direct Metal Laser Sintering (DMLS) processes, Laser based Solid Freeform Fabrication (SFF) Processes, Heat Flow Theory, Modeling of laser processing.

ASSESSMENTS

Description	Percentage Weightage (%)
Assignments	05-10%
Quizzes	10-15%
Mid Semester Exams	30-40%
End Semester Exam	40-50%