	National University of Sciences and Technology	
	Course Description	
Course Title Materials Selection and Design	**Course Code** **DME 837**	**Credit Hours** **3 – 0**

Textbook:

- Michael F. Ashby, Materials Selection in Mechanical Design (4th Ed.)

Reference Books:

- Materials Selection and Design, Md Abdul Maleque, Mohd Sapuan Salit, Springer, 2014

Course Objective:

The purpose of this course is to describe commercial nomenclatures for all common materials systems, to present basic methods for translating mechanical engineering functional requirements into materials property/selection format, and to develop methods for identifying and selecting materials for applications. The course objective is to successfully develop understanding of materials selection techniques in commercial applications, formulation of material indices and the use of Materials selection charts.

Course Outline:

Introduction and Synopsis, Materials in Design , The Evolution of Engineering Materials, The Evolution of Materials in Products, The Design Process, Types of Design, Design Tools and Materials Data , Function, Material, Shape, and Process, Engineering Materials and Their Properties , The Families of Engineering Materials, Materials Information for Design, Material Property Charts, The Material Property Index, Materials Selection—The Basics, The Selection Strategy, Material Indices, Computer-aided Selection, The Structural Index, Case Studies: Materials Selection, Selection with Multiple Constraints, Conflicting Objectives, Selection of Material and Shape, Shape Factors, Limits to Shape Efficiency, Exploring Material-shape Combinations, Material Indices That Include Shape, Graphical Coselecting Using Indices, Processes and Process Selection. Classifying Processes, The Processes: Shaping, Joining, Finishing, Processing for Properties, Systematic Process Selection, Ranking: Process Cost, Computer-aided Process Selection

ASSESSMENTS

Description	Percentage Weightage (%)
Assignments	10%
Quizzes	15%
Mid Semester Exams	30%
End Semester Exam	45%