MENG364 – Manufacturing Technology

Eastern Mediterranean University
Faculty of Engineering

Department:
Mechanical Engineering

Program Name: Mechanical Engineering	**Program Code:** 23		
Course Code: MENG364	**Course Title:** Manufacturing Technology	**Credits:** 4 Cr	**Year/Semester:** 2016-2017 Fall

☒ Engineering or Area Core
☐ Engineering Course offered by other programs
☐ Engineering or Area Elective
☐ Mathematics and Basic Sciences
☐ General Education

Prerequisite(s): MENG 286

Catalog Description:
Fundamentals and principles of major manufacturing processes: Casting, bulk deformation, Sheet Metalworking, Powder Metallurgy. Processing of polymers, ceramics, glass, rubber and composites. Metal cutting: cutting conditions, forces, temperatures, tool life, surface finish, coolants. Cutting tool materials. Principles, tools and process capabilities of basic machining operations: turning, milling, drilling, planning, shaping, boring, broaching. Gear manufacturing. Abrasive operations: grinding, finishing operations. Non-traditional processes. Basics of joining and assembling. Essentials of computer numerical control, Manufacturing Systems and Manufacturing Support Systems.

Instructor Name:	**Office no:**	**Office Tel:**
Associate Professor Dr Qasim Zeeshan	ME141	6301361

Course Web Page:
http://me.emu.edu.tr/zeeshan/courses

Textbook(s):
Fundamentals of Modern Manufacturing materials: Processes And Systems, M.P. Groover, 5th edition, John Wiley & Sons Inc. (2007).

Indicative Basic Reading List :
Manufacturing Technology Lecture Notes, V. Marinov, (2000)

Topics Covered and Class Schedule:
(4 hours of lectures and 1 hour of tutorial and lab per week)

Weeks 1-2 Introduction structure and methodology of the course; materials in engineering, manufacturing processes, and major classes of materials. **Mechanical & physical properties of materials**
Concepts of stress and strain, elastic deformation, stress-strain behaviour, anelasticity, plastic deformation, tensile properties, variability of materials properties, fluid properties, viscoelastic behaviour of polymers, volumetric and melting properties, mass diffusion, electrical and electrochemical properties
Engineering materials: Alloys and phase diagrams, ceramics, polymers, and composite materials
Weeks 2&3 Fundamental of metal casting: Overview of casting technology, metal casting processes
Weeks 4-6 Processing of various materials: Shaping processes for polymers, shaping process for polymer matrix composites, rubber processing technology, processing of ceramics, glass working
Week 7 Powder metallurgy: Powder preparing techniques, compacting, sintering
Weeks 8-9 Mid-Term Examination
Weeks 10&11 Bulk Forming: Fundamental of metal forming, rolling, extrusion, drawing, forging
Sheet Metal Forming: Bending, Cutting, Deep Drawing, and others
Week 12 Machining operations and machine tools: Turning, Milling, Drilling, Planing and shaping, Boaring, Broaching and gear manufacturing.
Abrasive Processes: Grinding, Lapping, Honning, finishing processes
Weeks 13&14 Joining and assembly processes: Welding, Types of welding processes, Bazing, Soldering, Mechanical Assembly. Automation technologies for manufacturing systems, Integrated manufacturing systems, Process Planning and Production control, Quality Control and Inspection,.
Week 15 Final Examination

Lecture and Tutorial Learning Outcome	Student Outcomes	Performed Assessments and Percentage
• What is manufacturing • Casting technology, casting types and casting defects • Bulk and sheet metal working; and forming defects • Chip removal machining processes and technology • Non-traditional machining processes • Welding technology, processes and defects • Introduction to processing of polymers and composites • Introduction to CNC technology and G Codes in manufacturing • Introduction to Powder Metallurgy • Introduction to Production Planning & Control	**e, j**	Midterm Exams 30% Final Exam 30% Assignment 10% Quizzes %10

Lab. Experiment Title and Lab. Equipment Used	Lab Learning Outcome	Student Outcomes	Performed Assessments and Percentage
• G-Code Programming (Machining) • Sand Casting • Sheet Metal Forming • Welding	• Introduction to CNC technology and G Codes in manufacturing • Casting technology, casting types and casting defects • Bulk and sheet metal working; and forming defects • Welding technology, processes and defects	**b, d**	Laboratory % 20

Contribution of Course to Criterion 5
Credit Hours for:
Mathematics & Basic Science : 0
Engineering Sciences and Design : 4
General Education : 0

Important Notes:
University rules and regulations are applied to this course.

NG Policy: Students who fail to attend/submit any of the aforementioned assessments will deserve NG Grade.