YILDIZ TEKNİK ÜNİVERSİTESİ — COURSE SYLLABUS

Mekatronik Mühendisliği Bölümü — Fall 2017-2018

Course Code-Name		**MKT 4161 MANUFACTURING TECHNIQUES**
Course Schedule		Thursday 13:00 - 16:00 A-504
Instructor's	**Name**	Prof.Dr. Haydar Livatyalı
	Phone	212-383 2888, GSM: 532-402 0622
	E-mail	hlivatya@yildiz.edu.tr
	Office Hours	Mon 9:00-11:00, 15:00-17:00; Thu 16:00-18:00 and Fri 9:00-10:00 and 16:00-18.00
Assistant's	**Name**	Namık Zengin
	E-mail	namikzengin@gmail.com
Textbook		Manufacturing Engineering & Technology (7th Ed.) by S Kalpakjian, S Schmid (2013) Prentice Hall ISBN-13: 978-0133128741
Supplementary Materials		1. Fundamentals of Modern Manufacturing, M.P. Groover, John Wiley, 4th SI Ed. 2010 2. Manufacturing Processes for Engineering Materials, S. Kalpakjian, Addison-Wesley, 7th Ed., 2002 3. Materials and Processes in Manufacturing, P. DeGarmo et al. Prentice Hall, 1999. 4. Introduction to Manufacturing Processes, J.E. Schey, 2nd Ed., McGraw Hill, 1987 5. 21st Century Manufacturing, P.K.Wright, Prentice-Hall, 2001 6. The Machine That Changed the World, J.P. Womack, D.T. Jones and D. Roos, Harper Perennial, 1990 (or "Dünyayı Değiştiren Makina" *in Turkish*, OSD Yay.) 7. İmal Usulleri, S.Anık, A.Dikicioğlu, M.Vural, Birsen Yay. İstanbul 2000 8. Metal Döküm Teknolojisi, A. Aran, Birsen Yay., İstanbul,1993 9. Metallere Plastik Şekil Verme, L.Çapan, Çağlayan Kit., İstanbul 1999 10. Talaş Kaldırma Yöntemleri ve Takım Tezgahları, M.Akkurt, Birsen Yay., İstanbul, 1992 11. Kaynak Teknolojisinin Esasları, L.M.Gourd, Çev. İ.B.Eryürek, O.Bodur, A.Dikicioğlu, Birsen Yay., İstanbul 1996
Course Content		Essentials of material science and material selection/ Casting technology / Powder technology / Polymer manufacturing / Processing methods for ceramics / Metal cutting theory and application areas/ Chip formation in metal cutting / Joining technology / Computer aided manufacturing technologies
Course Outline		**Week Content** 1. Introduction, processes vs. systems. Manufacturing properties of materials 2. Fund. of metal casting: classification, metallurgical principles, solidification, fluid flow and heat treatment 3. Metal casting processes: sand, investment, centrifugal, die, pressure. semi-solid 4. Casting design, materials and economics; Polymer processing: Injection molding 5. Classification of forming processes, Mechanical and metallurgical fundamentals. 6. Bulk and hot-working processes. Rolling, extrusion and drawing, forging

	7. Sheet metal forming and cold-working processes. Cutting, Bending, Stamping & Drawing, Presses. 8. Midterm 1 9. Classifications material removal processes, physical essentials. Chip formation. Tools and tool life. 10. Machining processes: Turning, boring, drilling, shaping, planning and machine tools 11. Machining processes: Milling, broaching and machine tools. Abrasive machining processes 12. Classification welding methods and physical principles. Gas flame processes. 13. Midterm 2 14. Arc processes and equipment. Resistance welding. Brazing and soldering. 15. Powder metallurgy. Free-form fabrication. Nontraditional and modern processes. Surface technology. Fabr. of micro-electronic devices 16. Final Exam
Grading	2 Midterms (40%) HW Assignments and quizzes (20%) 1 Final (40%)
Attendance	70% minimum
Additional Remarks	Authors' Recourse Address: http://www3.nd.edu/~manufact/MET.html

Course Objectives	1. To introduce traditional and modern manufacturing methods. To focus on special technologies such as casting, joining, powder metallurgy, plastic, ceramic, glass and composite materials production technologies 2. To teach basic principles, necessary technical equipment and application areas of manufacturing processes. 3. To instruct basic calculation methodology in manufacturing processes
Course Outcomes	1. Describe principles of manufacturing technologies and application areas 2. Describe limitations and application areas of manufacturing processes 3. Describe the equipment used in manufacturing technologies 4. Select suitable manufacturing methods for given part geometry and materials 5. Calculate process parameters in a given manufacturing process 6. Determine/select working parameters for a given manufacturing process