

T.C.
MARMARA ÜNİVERSİTESİ FEN BİLİMLERİ ENSTİTÜSÜ
LİSANSÜSTÜ DERS ÖNERİ FORMU

Dersin Adı	<i>Türkçe</i>	YARIİLETKEN AYGITLAR-II
	<i>İngilizce</i>	SEMICONDUCTOR DEVICES-II
Yarıyılı	Güz	Saat/Hafta (Teorik-Uygulama): (3+0)
Dersin Dili	Türkçe	Program: Fizik
Gerekçe: <p>The semiconductor industry is one of the most important of the twentieth century and its evaluation will impact us all. In the past three decades the Japanese have identified Si technology as the most important industry of our time and have done a marvelous job in advancing this technology.</p> <p>Processing technologies have always played central role in the development of semiconductor devices. Element of compound semiconductors continue to provide a gate way from electronic to photonic technology. The MOS technology is determined by the physical and chemical properties of the SiO₂ and other (such as Ga₂O₃) gate dielectrics. The study of diffusion in crystal semiconductor has played a remarkable role in elucidating the nature of defects at the atomistic level.</p> <p>For access to this massive amount of information and technology, there is a need for a course giving a comprehensive account of device physics, operational principles and processing and fabrication technology.</p>		
Dersin İçeriği (Türkçe): <p>Elementel Yarıiletkenler (Silisyum ve Germanyum), Bileşik Yarıiletkenler (III-V Bileşik Yarıiletkenler (GaAs, InP, InSb, GaP), Oksit Yarıiletkenler (ZnO, TiO₂, Fe₃O₄), Silicon Carbide), Aygıt İmalı (Kristal Büyütme, Kristal Kesme ve Parlatma, Kimyasal Aşındırma, Plazma Yöntemiyle Aşındırma, Kaplama Yöntemleri, Yalıtkan Tabaka Büyütme, Fotorezist Uygulamaları), Tümleşik Aygıt İmalı (Basitleştirilmiş Silisyum Tabanlı Mikro devre İmal İşlemi, İyon Ekme, Ekilmiş Katkılama Profili, Safsızlıkların Difüzyonu, Tümleşik Devreler)</p>		
CONTENTS: <p>Element Semiconductors (Silicon and Germanium), Compound Semiconductors (III-V Compound Semiconductors (GaAs, InP, InSb, GaP), Oxide semiconductors (ZnO, TiO₂, Fe₃O₄), Silicon Carbide), Device Fabrication (Crystal Growing, Crystal Cutting and Polishing, Chemical Etching, Plasma Etching Processing, Coating Methods, Insulator Layer Growing, Photoresist Applications), Integrated Device Application (A Simplified Silicon Microcircuit Fabrication Process, Ion Implantation, Implanted Doping Profile, Diffusion of Impurities, Integrated Circuits)</p>		
Kaynaklar: <ol style="list-style-type: none">1. E.H. Rhoderick, R.H. Williams, Metal-Semiconductor Contacts, Second Edition, Clarendon Press, Oxford, 19882. S.M.Sze, Physics of Semiconductor Devices, Second Edition, A Wiley-Inter Science Publication, New York, Chichester-Brisbane-Toronto-Singapore, 19883. Chih-Tang Sah, Fundamentals of Solid-State Electronics, World Scientific, Singapore-New Jersey-London-Hong Kong, 19914. M. Jaros, Physics and Applications of Semiconductor Microstructures, Clarendon Press, Oxford, 19905. K. Leaver, Microelectronic Devices, Imperial College Press, U.K., 19976. Edited By S. Coffa, F. Priolo, E. Rimini, J.M. Poate, Crucial Issues in Semiconductor Materials and Processing Technologies, NATO Series E:Applied Sciences-Vol:222, 19927. R.E. Williams, Gallium Arsenide Processing Techniques, Artech House INC., Dedham, 19848. C.W. Wilmsen, Physics and Chemistry of III-V Compound Semiconductor, Plenum Press, New York, 1985		