

Course Title-Course Code: ILT515 Semiconductor Materials Technology And Applications I				Name of the Programme: Advanced Technology					
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Term Project	Homework	Other	Total	Credit	ECTS Credit
	42		36		50	60	188	3	7.5
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	None								
Course Contents	Types of semiconductors, p-n, n-p-n, p-n-p, p-i-n junctions, Semiconductor crystal structures, Crystal structure defects, Growth mechanisms of semiconductor crystals and thin-films, Growth methods of semiconductor crystals and thin-films, Annealing of semiconductor materials, Working principles and applications of vacuum pumps, Metalization and oxids depositions in vacuum evaporation and magnetron sputtering systems, Etching, Chemical (Wet) and Dry etching, Observation defects of semiconductors after wet etching process with metallographical microscope.								
Course Objectives	To be informed about technology of semiconductor nanostructure materials, growth methods of bulk and epitaxial semiconductor layers, annealing, and metallization and oxids depositions in vacuum evaporation and magnetron sputtering systems.								
Learning Outcomes and Competences	To gather information about the principles of nanodimensional semiconductor materials technology. Courses are supported with laboratory works including chemical processes and observation of experiments results.								
Textbook and /or References	<ul style="list-style-type: none"> -“ The Growth of Single Crystals”, R.A. Laudise, Prentice- Hall, Inc, , 1970 - “Crystal Growth Mechanisms: Energetics, Kinetics and Transport”, - R.L. Parker, National Bureau of Standards, Washington D.C. 1970 -Crystal Technology, W.L. Bond, John&Wiley, NY, 1980 -“Molecular Beam Epitaxy and Heterostructures”, Leroy L. Chang, Klaus Ploog. Nijhoff, Dordrecht, 1985 -“The Technology and Physics of Molecular Beam Epitaxy”, A.Y. Cho -MBE: Fundamentals and Current Status, M.A. Herman, H.Sitter, Springer, Berlin, 1996 -Physics Of Semiconductor Devices, S.M. Sze, Springer, Wiley-Interscience, 2002 -Kathal Fiziği, J.R. Hook, H.E. Hall, John Wiley & Sons, 1998 -Etching of Crystals, K. Sangwal, Elsevier, 1987 								
Assessment Criteria								<i>If any, mark as (X)</i>	Percent (%)
	Midterm Exams							X	20
	Quizzes								
	Homeworks							X	20
	Projects								
	Term Paper								
	Laboratory Work							X	10
	Other								

	Final Exam	X	50
Instructors	Prof. Dr. Tofiq Mammadov		
Week	Subject		
1	Types of semiconductors,		
2	p-n, n-p-n, p-n-p, p-i-n junctions,		
3	Semiconductor crystal structures,		
4	Crystal structure defects,		
5	Growth mechanisms of semiconductor crystals and nanodimensional thin-films,		
6	Growth methods of semiconductor singlecrystals,		
7	Growth methods of semiconductor nanodimensional thin-films and heteronanostructures.		
8	Working principles and applications of vacuum pumps,		
9	Annealing of semiconductor materials,		
10	Metalization in vacuum evaporation systems,		
11	Metalization and oxids depositions in magnetron sputtering systems,		
12	Etching. Chemical (Wet) and Dry etching,		
13	Wet etching practice of Semiconductor nanostructures.		
14	Visualization of defects made up with wet etching practice with metallographical microscope.		