

**MATERIALS and NANOTECHNOLOGY ENGINEERING PhD Program (on MSc)**

<b>REMEDIAL COURSES</b>				
<b>Dept.</b>	<b>Code</b>	<b>Course Name</b>	<b>CR.</b>	<b>ECTS</b>
MSN	220	Materials Characterization I	NC	
MSN	230	Transport Phenomena	NC	
MSN	240	Phase Diagrams	NC	
MSN	223	Mechanical Behavior of Materials	NC	
MSN	321	Materials Characterization II	NC	
MSN	301	Materials Production Processes-I	NC	
MSN	302	Materials Production Processes-II	NC	
<b>PROGRAM COURSES</b>				
<b>Dept.</b>	<b>Code</b>	<b>Course Name</b>	<b>CR.</b>	<b>ECTS</b>
MSN	660	Advanced Manufacturing Techniques in Materials Engineering	3	10
MSN	510	Advanced Materials Characterization Techniques	3	10
MSN	5/6xx	Departmental Elective I	3	10
MSN	5/6xx	Departmental Elective II	3	10
	5/6xx	Free Elective I	3	10
	5/6xx	Free Elective II*	3	10
	5/6xx	Free Elective III	3	10
MSN	690	PhD Seminar	NC	2
MSN	691	Independent Study for Qualifying Exam	NC	30
MSN	700	PhD Dissertation	NC	150
		TOTAL	21	252
<b>EXTRA/NON-DEGREE COURSES</b>				
<b>Dept.</b>	<b>Code</b>	<b>Course Name</b>	<b>CR.</b>	<b>ECTS</b>
		Extra/Non-degree	NC	

\*If a student did not take a research method/methodologies course during MS work, he/she shall take one of the courses in Research Methodologies instead of Free Elective II

<b>Course Group</b>	<b>Description</b>
Departmental Elective I-II	Materials and Nanotechnology courses under the GSNAS
Free Elective I-III	Unrestricted, by approval of advisor and MSN department
Research Methodologies	MSN 501
Extra/Non-degree	Optional non-credit (NC) courses that are not part of the program
Remedial Courses	Undergraduate level courses offered by department.