

Curriculum Checklist - ITU Dual Degree Program in Bioengineering				145 credits	k:advising/BIOE degree/checklists/DW ITU DDP 2015 checklist and equiv		
2014-2015 CATALOG		Effective FALL 2015		ITU cr. 77	Student:		
				MSU cr. 68	ID:		
S. Thomas					Grad. Date:		
YEAR 1:	ISTANBUL TECHNICAL UNIVERSITY						
FALL SEMESTER					MSU or ITU Course Equivalent:		
Course #	Course Title	Credits	Hours	Grade	Sub #	Sub Title	Sub Cr
BEN 107	Art of Engineering (MSU CORE IA)	3			IA CORE	No direct equivalent	3
BEN 111	Intro to Bioengineering (Biochem/Biotechnology)	2	(2 + 0)		EBIO 100	Intro to Biological Engr	2
CHE 101	Chemistry I (with Lab) (MSU CORE IN)	4	(3 + 2)		CHMY 141	College Chemistry I	4
CMP 103	Intro to Computers and Information Systems	2	(2 + 0)		CAPP120	Introduction to Computers	2
MTH 103	Calculus I	4	(3 + 2)		M 171Q	Calculus I	4
PHY 103	Physics I (with lab)	4	(3 + 2)		PHSX 220	Physics I (w/ calculus)	4
TUR 101	Turkish I	2	(2 + 0)		ELEC 100	Turkish I	2
ULP 101	New Begin.Fresh.Sem&Serv.to Leader.I	0				No direct equivalent	2
		<i>Total Credit Hours</i>	21				

SPRING SEMESTER							
Course #	Course Title	Credits	Hours	Grade	Sub #	Sub Title	Sub Cr
MTH 104	Calculus II	4	(3 + 2)		M 172Q	Calculus II	4
PHY 104	Physics II (with lab)	4	(3 + 2)		PHSX 222	Physics II (w/ calculus)	4
CHE 301	Chemistry II (MSU CORE IN)	4	(2 + 2)		CHMY 143	College Chemistry II	4
CMP 102 or BIL 108E	Intro to Scientific and Engineering Computing	2	(2 + 0)		EGEN 102	Intro to Engr Comp Appl	2
BIO 101	General Biology	3			BIOB 170IN	Principles Biological Diversity	3
TUR 102	Turkish II	2	(2 + 0)		ELEC 100 D	Turkish II	2
GED 037	Knowledge, Language and Logic (MSU CORE IH)	3	(3 + 0)		ELEC 100 IH	Knowledge, Lang & Logic	3
ULP 102	New Begin.Fresh.Sem&Serv.to Leader.II	0				No direct equivalent	
		<i>Total Credit Hours</i>	22				

YEAR 2: MONTANA STATE UNIVERSITY							
FALL SEMESTER							
Course #	Course Title	Credits	Hours	Grade	Sub #	Sub Title	Sub Cr
M 273	Calculus III	4	(4 + 0)		MAT 213E	Mathematics III	4
CHMY 211	Elements of Organic Chemistry	5	(4 + 3)		KIM 104E	Organic Chemistry WITH LAB KIM104EL required	4 ITU (5 req.-1 cr)
ECHM 201	Elementary Principles of Chemical & Biological Engr	3	(3 + 0)			No direct equivalent	
WRIT 101W	College Writing I (MSU CORE W)	3	(3 + 0)			No direct equivalent	
EGEN 350	Applied Engr Data Analysis	2			ISL 213E	Statistics I (First choice)	
		<i>Total Credit Hours</i>	17		MAT 271E	Probability and Statistics (2nd choice)	

SPRING SEMESTER							
Course #	Course Title	Credits	Hours	Grade	Sub #	Sub Title	Sub Cr
M 274	Introduction to Differential Equations	4	(4 + 0)		MAT 201E or MAT 232E	Differential Equations	4
BCH 380	General Biochemistry (with lab)	5	(4 + 3)			No direct equivalent	
EBIO 216	Principles of Biological Engineering	3	(3 + 0)			No direct equivalent	
ECHM 321	Fluid Mechanics Operations	3	(3 + 0)		AKM 204E	Fluid Mechanics or	3

-- ECHM 321	Additional equivalent					CIE 354	Fluid Mechanics	3
COMX 111US	Intro. To Public Speaking (MSU CORE US)	3	(3 + 0)				No direct equivalent	
	<i>Total Credit Hours</i>	18						

YEAR 3:		ISTANBUL TECHNICAL UNIVERSITY						
FALL SEMESTER								
Course #	Course Title	Credits	Hours	Grade	Sub #	Sub Title	Sub Cr	
ATA 101	History of the Turkish Revolution I	2	(2 + 0)			No direct equivalent		
BEN 102	Microbiology	3	(2 + 2)		BIOM 360	General Microbiology	3 [5]	
BEN 321	Reactor Kinetics and Design in Biotechnology	3	(3 + 0)		EBIO 438	Bioprocess Engineering	3	
BEN 323	Materials Science	3			EMAT 251	Materials Structures and Properties	3	
BEN 352	Transport Processes in Bioengineering	3	(3 + 0)		EBIO 324	Bioengineering Transport	3	
	Bioengineering Elective	3				SEE BELOW		
	<i>Total Credit Hours</i>	17						

SPRING SEMESTER								
Course #	Course Title	Credits	Hours	Grade	Sub #	Sub Title	Sub Cr	
ATA 102	History of the Turkish Revolution II (MSU CORE IS)	2	(3 + 0)		ELEC100IS	No direct equivalent		
BEN 324	Bioengineering Lab I	3			EBIO 442	Bioengineering Lab I	3	
BEN 326	Genetics	3	(3 + 0)		BIOB 375	General Genetics	3	
BEN 351	Bioengineering Thermodynamics	3	(3 + 0)		ELEC 300	Bioengineering Thermodynamics	3	
	Bioengineering Elective	3						
	Technical Elective	3						
	<i>Total Credit Hours</i>	17						

YEAR 4:		MONTANA STATE UNIVERSITY						
FALL SEMESTER								
Course #	Course Title	Credits	Hours	Grade	Sub #	Sub Title	Sub Cr	
EBIO 411R	EBIO Design I (Senior/Graduation Project)	3	(2 + 2)			No direct equivalent	3	
EGEN 310R	Introduction to Engineering Design	3	(3 + 0)			No direct equivalent	3	
	Engineering Elective (ECHM 442 strongly recommended)	3	(3 + 0)			[see BIOE Engineering Elec. List]	3	
	Engineering Elective	3	(3 + 0)			[see BIOE Engineering Elec. List]	3	
	Bioengineering Elective	3	(3 + 0)			[see BIOE Bioengr. Elec. List]		
	<i>Total Credit Hours</i>	15						

SPRING SEMESTER								
Course #	Course Title	Credits	Hours	Grade	Sub #	Sub Title	Sub Cr	
EBIO 439	Downstream Processing	3	(3 + 0)			No direct equivalent		
EBIO 412R	EBIO Design II	3	(3 + 0)			No direct equivalent		
EBIO 443	Bioengineering Laboratory II	3	(4 + 0)			No direct equivalent		
ECHM 451	Process Dynamics & Control	3	(3 + 0)			No direct equivalent		
	Engineering Elective	3	(3 + 0)			[see BIOE Engineering Elec. List]		
	Bioengineering Elective	3	(0 + 6)			[see BIOE Bioengr. Elec. List]		
	<i>Total Credit Hours</i>	18						

POSSIBLE ELECTIVES AT ITU:						<i>Sub Cr</i>	
BEN312	Enzymology	3			ELEC300	Enzymology	3
BEN332	Env Biotechnology	3				<i>No direct equivalent</i>	
BEN 335	BIOSENSORS	3				<i>No direct equivalent</i>	
BEN 337	Biofuels and Bioenergy	3				<i>No direct equivalent</i>	
BEN 341	BIOMATERIALS	3				<i>No direct equivalent</i>	
BEN322	Exp. Design & Modeling in Bioe	3				<i>No direct equivalent</i>	