

Curriculum Checklist - ITU Dual Degree Program in Bioengineering					145 credits	k:advising/BIOE degree/checklists/DW ITU DDP 2017 checklist and equi	
2017-2018 CATALOG			Effective FALL 2017		ITU cr. 77	Student:	
S. Thomas					MSU cr. 68	ID:	
YEAR 1:	ISTANBUL TECHNICAL UNIVERSITY					Grad. Date:	
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)	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	4	(2 + 2)		CHMY 143	College Chemistry II	4
<small>CMP 102 or BIL 108E</small>	Intro to Scientific and Engineering Computing	2	(2 + 0)		EGEN 102	Intro to Engr Comp Appl	2
BIO 101	General Biology (MSU CORE IN)	3			BIOB 170IN	Principles Biological Diversity	3
TUR 102	Turkish II	2	(2 + 0)		ELEC 100	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 <small>WITH LAB</small> 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
** or "D" (Only once)	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	
** or "D" (Only once)	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					

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