Metropolia UAS	Biotechnology and Chemical						Jer								
Engineering 29.1.							sustainable developme								
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			science				e de								
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			mat			ucti	Jm,		s aı			competence			е
			.⊑			rod	ουο		rial			mc	Ф	ce	oue
			Strong engineering skills in mathematics and	S	Skills to conduct projects	Clean and sustainable production technologies	Know-how for circular economy	uo	Efficiency for using materials and	ce	_		competence	competence	Technological competence
			g	skills	oroj	ıabl	ula	ıctji	g n	competence	competence	community	ete	ube	luc
		ts	erin	on :	ict p	tair	circ	rodi	usin	be	ete	mu	mc	cor	S I
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		extent of credits	Stro	Good interaction	Skill	Slea	Śno	Clean water production	Effic	Learning	Ethical	Working	nnovation	Multicultural	_ec
1st Year of study	Orientation to Field and Studies in Biotechnical,	۳	0)		0)			J	Ш		ш	_			
	Chemical and Surface Engineering	30													
	Orientation to Field and Studies	5		х						х	х	х			
	Fundamentals of Chemistry 1	5 5	X	v	v		х			X		v	v		
	Introductory Project and Professional Communication Fundamentals of Chemistry 2	5	X	Х	Х					X		Х	Х		
	Fundamentals of Mathematics and Natural Sciences 1	5	Х							Х					
	Fundamentals of Mathematics and Natural Sciences 2	5	х							х					
	Introduction to Industrial Processes in Biotechnical,														
	Chemical and Materials Engineering	<b>30</b> 5							V						V
	Engineering Chemistry Math and Science Basics 3	5	X						Х	х				х	Х
	Project Course in Biotechnology and Chemical Engineering		Х	х	х		х			^		х	х	^	
	Analytical and Organic Chemistry	5	х					х		х					х
	Industrial processes and materials	5				Х	Х	Х	Х	Х					Х
2nd Year of study	In total	60 <b>30</b>													
	Reactions and Reactors Physical and Chemical Properties of Fluids and Materials	5	х			х	х		х	х					х
	Fluid Mechanics	5	Х	х		х	х	х	х						х
	Mathematics in Process Technology	5	х												
	Chemical Reaction Technology	5 5	Х			Х									Х
	Material and Energy Balances Heat Transfer and Energy Efficiency	5	X X			X X	Х	Х	X X						X X
	Process Engineering	30	^			^			_						
	Introduction to Plant Engineering	5			х	х	х	х	х						х
	Statistics and Design of experiments	5	Х						Х						
	Industrial Business	5 5		.,	Х		Х			Х	Х	Х		X	Х
	Engineering English and Communication Skills Unit Operations 1	5	х	Х				х						Х	х
	Process Operation Control and Maintenance	5	Х			х		Х	х		х				х
	In total	60													
3rd Year of study	Applied Process Engineering	25													
	Lab workshop, Chemical engineering Unit operations 2	5 5	X	Х		X X		X X		Х				Х	X
	Multidisciplinary Innovation Project	10	X	х	х	^	х	X	х	х		х	х	х	X
	Engineering Swedish	5		х										x	
	Finnish as a Second Language: Finnish at Work	5		х										х	
	Sustainable Plant Design	20													
	Advanced level of Plant Engineering Automation Technology	10 5	X		Х	Х	Х	X X	Х						X X
	Environment and Safety	5	X			х	х	X	х		х				x
	Elective Study Module	15													
	In total	60													
4th Year of study	Bachelor's Thesis	15													
4th Year of study	Bachelor's Thesis Bachelor's Thesis	15	х	х	х	Х	х	х	х	х			х		Х
4th Year of study	Bachelor's Thesis Bachelor's Thesis Work Placement	15 <b>30</b>			х	Х		Х	х	х		x		x	
4th Year of study	Bachelor's Thesis Bachelor's Thesis	15		x x x	х	x x	x x x	x	х	х		x x	x x x	x x	X X X
4th Year of study	Bachelor's Thesis Bachelor's Thesis Work Placement Work Placement 1	15 <b>30</b> 15		х	х		х		Х	х			х		х