## SPECIALIZATIONS IN BIOSYSTEMS ENGINEERING

Student's accepted between 2021-2023

	Group A: Sciences Electives must accurate to	oth		BIOI	MEDICAL	Group B: BIOE Dosign Electives - Select 2 Cou	rcoc		
Course #	Group A: Sciences Electives - must complete b Course Title		Yr Taken	GRADE	Course #	Group B: BIOE Design Electives - Select 3 Cou Course Title	Cr Hr	Yr Taken	GRAD
BIOL 1410	Anatomy of the Human Body	3	aken	SIADE	BIOE 4414	Imaging & Spectroscopy	4	ruken	31.40
BIOL 1410	Physiology of the Human Body	3			BIOE 4610	Assistive Technology Devices	4		
101 1412	invology of the Human Body	J			BIOE 4640	Bioengineering Application	4		
	Group C: Complementary Studies - Select 1 Cou	irses			BIOE 4650	Textiles in Healthcare and Medical Applications	4		
Course #	Course Title		Yr Taken	GRADE	5102 1000				
NG 1900	Occupational Health and Safety Awareness	3				Group D: Free Electives - Select 2 Courses	*		
NVR 3400	Introduction to Environment and Health	3			Course #	Course Title	Cr Hr	Yr Taken	GRAD
HIST 4660	History of Health and Disease	6			BIOL 2410	Human Physiology 1	3		
HIST 4680	Social History of Health & Disease in Modern CDN	6			BIOL 2420	Human Physiology 2	3		
INSC 1210	Nutrition for Health and Changing Lifestyles	3			BIOL 4470	Physiology of Excitable Cells	3		
NDG 3240	Indigenous Medicine and Health	3			CHEM 2100	Organic Chemistry 1: Foundations of Organic Chemistry	3		
(PER 1200	Physical Activity, Health and Wellness	3			CHEM 2700	Biochemistry 1: Biomolecules and an Introduction to Metabolic Energy	3		
PHIL 2740	Ethics and Biomedicine	3			CHEM 2710	Biochemistry 2: Catabolism, Synthesis, and Information Pathways	3		
					ECE 4610	Biomedical Instrumentation and Signal Processing	4		
					KPER 2330	Biomechanics	3		
					KIN 4330	Advanced Biomechanics	3		
					MECH 4322	Design of Biomechanical Devices (T03)	4		
					MECH 4832	Biomaterials in Biomedical Engineering	4		
					PHYS 3220	Medical Physics and Physiological Measurement	3		
					PHYS 4400	Linear Systems for Imaging	3		
				BIOR	ESOURCE				
	Group A: Sciences Electives - 2 Courses to Com	plete				Group B: BIOE Design Electives - Select 3 Cou	1		
	Must complete the following course				Course #	Course Title	Cr Hr	Yr Taken	GRAD
Course #	Course Title		Yr Taken	GRADE	BIOE 4390	Unit Operations 1	4		
OIL 4060	Physical Properties of Soils	3			BIOE 4412	Light-Frame Building	4		
	Select 1 Course	-			BIOE 4420	Crop Preservation	4		
ANSC 3530	The Animal and its Environment	3			BIOE 4440	Bioprocessing for Biorefining	4		
LNT 2510	Fundamentals of Horticulture	3			BIOE 4560	Structural Design in Wood	4		
					BIOE 4590	Management By-Product	4		
	Group C: Complementary Studies - Select 1 Cou				BIOE 4600	Water Management System	4		
Course #	Course Title		Yr Taken	GRADE					
ABIZ 1000	Introduction to Agribusiness Management	3				Group D: Free Electives - Select 2 Courses			
ABIZ 1010	Economics of World Food Issues and Policies	3			Course #	Course Title	Cr Hr	Yr Taken	GRAD
ABIZ 3530	Farm Management	3			AGRI 1600	Introduction to Agrifood Systems	3		
OOD 1000	Food Safety Today and Tomorrow	3			ENTM 3170	Crop Protection Entomology	3		
GEOG 2520	Geography of Natural Resources	3			FOOD 3010	Food Process 1			
		-				4	3		
					FOOD 4260	Water Management in Food Processing	3		
					FOOD 4260 PLNT 2500	Water Management in Food Processing Crop Production	3		
					FOOD 4260 PLNT 2500 PLNT 2510	Water Management in Food Processing Crop Production Fundamentals of Horticulture <sup>+</sup>	3 3 3		
					FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560	Water Management in Food Processing Crop Production Fundamentals of Horticulture <sup>*</sup> Organic Crop Production on the Prairies	3 3 3 3 3		
					FOOD 4260 PLNT 2500 PLNT 2510	Water Management in Food Processing Crop Production Fundamentals of Horticulture <sup>+</sup>	3 3 3		
					FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560	Water Management in Food Processing Crop Production Fundamentals of Horticulture <sup>*</sup> Organic Crop Production on the Prairies	3 3 3 3 3		
PLNT 2510 c	an be counted as a free elective if ANSC 3530 or BIOE 2600 is				FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560	Water Management in Food Processing Crop Production Fundamentals of Horticulture <sup>*</sup> Organic Crop Production on the Prairies	3 3 3 3 3		
PLNT 2510 c	an be counted as a free elective if ANSC 3530 or BIOE 2600 is			ENVIR	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture <sup>*</sup> Organic Crop Production on the Prairies	3 3 3 3 3		
PLNT 2510 c		taken.		ENVIR	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560	Water Management in Food Processing Crop Production Fundamentals of Horticulture <sup>*</sup> Organic Crop Production on the Prairies	3 3 3 3 3		
PLNT 2510 c	an be counted as a free elective if ANSC 3530 or BIOE 2600 is Group A: Sciences Electives - 2 courses to com Must complete the following course	taken.		ENVIRG	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 DNMENTAL	Water Management in Food Processing Crop Production Fundamentals of Horticulture <sup>+</sup> Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics	3 3 3 3 3 3 3	Yr Taken	GRAD
PLNT 2510 c	Group A: Sciences Electives - 2 courses to com	taken.	Yr Taken	ENVIR	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title	3 3 3 3 3 3 3	Yr Taken	GRAL
Course #	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title	taken. Diete	Yr Taken		FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520 SOIMENTAL Course # BIOE 4412	Water Management in Food Processing Crop Production Fundamentals of Horticulture <sup>+</sup> Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems	3 3 3 3 3 3 4 5 5 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7	Yr Taken	GRAD
Course #	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils	taken.	Yr Taken		FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520 SOIMENTAL Course # BIOE 4412 BIOE 4460	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment	3 3 3 3 3 3 4 5 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8	Yr Taken	GRAI
<b>Course #</b> 601L 4060	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course	taken. Diete Cr Hr 3	Yr Taken		FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520 SOIMENTAL Course # BIOE 4412 BIOE 4412 BIOE 44590	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product	3     3     3     3     3     3     3     3     4     4     4	Yr Taken	GRAL
<b>Course #</b> 501L 4060 AGEC 2370	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology	taken. Dete Cr Hr 3	Yr Taken		FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System	3 3 3 3 3 3 4 3 3 4 5 5 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8	Yr Taken	GRAD
<b>Course #</b> OIL 4060	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course	taken. Diete Cr Hr 3	Yr Taken		FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520 SOIMENTAL Course # BIOE 4412 BIOE 4412 BIOE 44590	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product	3     3     3     3     3     3     3     3     4     4     4	Yr Taken	GRAI
<b>Course #</b> GOIL 4060	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology	taken.	Yr Taken		FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System	3 3 3 3 3 3 4 3 3 4 5 5 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8	Yr Taken	GRAI
Course # OIL 4060 AGEC 2370 BIOL 2300	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology Principles of Ecology Group C: Complementary Studies - Select 1 Course	taken. Dete Cr Hr 3 3 3 3	Yr Taken Yr Taken		FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System	3     3     3     3     3     3	Yr Taken	GRAI
Course # OIL 4060 AGEC 2370 BIOL 2300	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology Principles of Ecology Group C: Complementary Studies - Select 1 Course Course Title	taken. Diete Cr Hr 3 3 3 3 srses Cr Hr		GRADE	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 <b>DNMENTAL</b> Course # BIOE 4412 BIOE 4412 BIOE 4460 BIOE 4600 BIOE 4620	Water Management in Food Processing Crop Production Fundamentals of Horticulture <sup>4</sup> Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System Remediation Engineering	3     3     3     3     3     3		
Course # OIL 4060 AGEC 2370 BIOL 2300 Course # ABIZ 2390	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology Principles of Ecology Group C: Complementary Studies - Select 1 Course Course Title Introduction to Environmental Economics	taken. Cr Hr 3 3 Cr Hr 3 Cr Hr 3 Cr Hr 3		GRADE	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System Remediation Engineering Group D: Free Electives - Select 2 Courses Course Title	3     3     3     3     3     3     3     3     4     4     4     4     4     4     4     4     4     4     4     4     4		
Course # GOIL 4060 AGEC 2370 BIOL 2300 Course # ABIZ 2390 ENVR 1000	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology Principles of Ecology Group C: Complementary Studies - Select 1 Course Course Title Introduction to Environmental Economics Environmental Science 1 - Concepts	taken. Diete Cr Hr 3 3 3 3 srses Cr Hr		GRADE	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System Remediation Engineering Group D: Free Electives - Select 2 Courses Course Title Environmental Engineering Analysis	3     3     3     3     3     3     3     4		
Course # GOIL 4060 AGEC 2370 BIOL 2300 Course # ABIZ 2390 ENVR 1000 ENVR 2000	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology Principles of Ecology Group C: Complementary Studies - Select 1 Cou Course Title Introduction to Environmental Economics Environmental Science 1 - Concepts Environmental Science 2 - Issues	taken. Diete Cr Hr 3 3 3 srses Cr Hr 3 3 3		GRADE	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System Remediation Engineering Group D: Free Electives - Select 2 Courses Course Title Environmental Engineering Analysis Environmental Engineering Design	3     3 <t< td=""><td></td><td></td></t<>		
Course # GOIL 4060 AGEC 2370 BIOL 2300 Course # ABIZ 2390 ENVR 1000 ENVR 2000 ENVR 2810	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology Principles of Ecology Group C: Complementary Studies - Select 1 Cou Course Title Introduction to Environmental Economics Environmental Science 1 - Concepts Environmental Science 2 - Issues Environmental Science 2 - Issues	taken. blete Cr Hr 3 3 4		GRADE	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System Remediation Engineering Group D: Free Electives - Select 2 Courses Course Title Environmental Engineering Analysis Environmental Engineering Design Hazardous Waste Treatment	3     3     3     3     3     3     3     4     4     4     4     4     4     4     4     4     4     4     4     4     4     4     4     4     4		
Course # OIL 4060 AGEC 2370 BIOL 2300 Course # ABIZ 2390 ENVR 1000 ENVR 2810 ENVR 3160	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology Principles of Ecology Group C: Complementary Studies - Select 1 Cou Course Title Introduction to Environmental Economics Environmental Science 1 - Concepts Environmental Science 2 - Issues Environmental Responsibilities and the Law	taken. cr Hr 3 3 3 Cr Hr 3 4 4 4 4		GRADE	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System Remediation Engineering Group D: Free Electives - Select 2 Courses Course Title Environmental Engineering Analysis Environmental Engineering Design Hazardous Waste Treatment Environmental Chemistry	3     3     3     3     3     3     3     4     4     4     4     4     4     4     4     4     4     4     4     4     4     4     3		
Course # OIL 4060 AGEC 2370 BIOL 2300 Course # ABIZ 2390 ENVR 1000 ENVR 2810 ENVR 2810 ENVR 3160 ENVR 3400	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology Principles of Ecology Group C: Complementary Studies - Select 1 Cou Course Title Introduction to Environmental Economics Environmental Science 1 - Concepts Environmental Science 2 - Issues Environmental Responsibilities and the Law Introduction to Environment and Health	taken.         cr Hr         3         cr Hr         3         cr Hr         3         d         4         4         3		GRADE	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System Remediation Engineering Group D: Free Electives - Select 2 Courses Course Title Environmental Engineering Analysis Environmental Engineering Design Hazardous Waste Treatment Environmental Chemistry Environmental Conservation and Restoration	3     3     3     3     3     3     3     4     4     4     4     4     4     4     4     4     4     3     3		
Course # OIL 4060 AGEC 2370 BIOL 2300 Course # ABIZ 2390 ENVR 1000 ENVR 2000 ENVR 2000 ENVR 3160 ENVR 3400 ENVR 3750	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology Principles of Ecology Group C: Complementary Studies - Select 1 Cou Course Title Introduction to Environmental Economics Environmental Science 1 - Concepts Environmental Science 2 - Issues Environmental Responsibilities and the Law Introduction to Environment and Health Green Building and Planning	taken.         cr Hr         3         Gr Hr         3         Gr Hr         3         4         4         3         4         3         3		GRADE	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System Remediation Engineering Group D: Free Electives - Select 2 Courses Course Title Environmental Engineering Analysis Environmental Engineering Design Hazardous Waste Treatment Environmental Chemistry	3     3     3     3     3     3     3     4     4     4     4     4     4     4     4     4     4     4     4     4     4     4     3		
Course # GOIL 4060 AGEC 2370 BIOL 2300 BIOL 2300 ENVR 2300 ENVR 2300 ENVR 2000 ENVR 2810 ENVR 3400 ENVR 3400 ENVR 3750 ENVR 3850	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology Principles of Ecology Group C: Complementary Studies - Select 1 Cou Course Title Introduction to Environmental Economics Environmental Science 1 - Concepts Environmental Science 2 - Issues Environmental Science 2 - Issues Environmental Responsibilities and the Law Introduction to Environment and Health Green Building and Planning Sustainable Manitoba (A)	Cr Hr         3         3         3         3         3         4         4         3         3         3		GRADE	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System Remediation Engineering Group D: Free Electives - Select 2 Courses Course Title Environmental Engineering Analysis Environmental Engineering Design Hazardous Waste Treatment Environmental Chemistry Environmental Conservation and Restoration	3     3     3     3     3     3     3     4     4     4     4     4     4     4     4     4     4     3     3		
Course # GOIL 4060 AGEC 2370 BIOL 2300 BIOL 2300 ENVR 1000 ENVR 1000 ENVR 2810 ENVR 3160 ENVR 3160 ENVR 3750 ENVR 3850 ENVR 3850	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology Principles of Ecology Group C: Complementary Studies - Select 1 Course Course Title Introduction to Environmental Economics Environmental Science 1 - Concepts Environmental Science 2 - Issues Environmental Science 2 - Issues Environmental Responsibilities and the Law Introduction to Environment and Health Green Building and Planning Sustainable Manitoba (A) Ecosystem Management	Cr Hr         3         3         3         3         4         4         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3		GRADE	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System Remediation Engineering Group D: Free Electives - Select 2 Courses Course Title Environmental Engineering Analysis Environmental Engineering Design Hazardous Waste Treatment Environmental Chemistry Environmental Conservation and Restoration	3     3     3     3     3     3     3     4     4     4     4     4     4     4     4     4     4     3     3		GRAD
Course # GOIL 4060 AGEC 2370 BIOL 2300 BIOL 2300 ENVR 1000 ENVR 2000 ENVR 2000 ENVR 2810 ENVR 3160 ENVR 3160 ENVR 3400 ENVR 3400 ENVR 3850 ENVR 4050 ENVR 4400	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology Principles of Ecology Group C: Complementary Studies - Select 1 Course Environmental Science 1 - Concepts Environmental Science 2 - Issues Environmental Science 2 - Issues Environmental Science 2 - Issues Environmental Responsibilities and the Law Introduction to Environment and Health Green Building and Planning Sustainable Manitoba (A) Ecosystem Management Advanced Issues in Environment and Health	taken. Cr Hr 3 Cr Hr 3 Cr Hr 3 4 4 4 4 3 3 3 3 3 3 3 3 3 3 3 3 3		GRADE	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System Remediation Engineering Group D: Free Electives - Select 2 Courses Course Title Environmental Engineering Analysis Environmental Engineering Design Hazardous Waste Treatment Environmental Chemistry Environmental Conservation and Restoration	3     3     3     3     3     3     3     4     4     4     4     4     4     4     4     4     4     3     3		
Course # GOIL 4060 AGEC 2370 BIOL 2300 BIOL 2300 ENVR 1000 ENVR 1000 ENVR 2810 ENVR 3160 ENVR 3160 ENVR 3750 ENVR 3850 ENVR 3850	Group A: Sciences Electives - 2 courses to com Must complete the following course Course Title Physical Properties of Soils Select 1 course Principles of Ecology Principles of Ecology Group C: Complementary Studies - Select 1 Course Course Title Introduction to Environmental Economics Environmental Science 1 - Concepts Environmental Science 2 - Issues Environmental Science 2 - Issues Environmental Responsibilities and the Law Introduction to Environment and Health Green Building and Planning Sustainable Manitoba (A) Ecosystem Management	Cr Hr         3         3         3         3         4         4         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3		GRADE	FOOD 4260 PLNT 2500 PLNT 2510 PLNT 3560 SOIL 3520	Water Management in Food Processing Crop Production Fundamentals of Horticulture* Organic Crop Production on the Prairies Pesticides: Environment, Economics and Ethics Pesticides: Environment, Economics and Ethics Group B: BIOE Design Electives - Select 3 Cou Course Title Design of Light-Frame Building Systems Air Pollution Assessment Management By-Product Water Management System Remediation Engineering Group D: Free Electives - Select 2 Courses Course Title Environmental Engineering Analysis Environmental Engineering Design Hazardous Waste Treatment Environmental Chemistry Environmental Conservation and Restoration	3     3     3     3     3     3     3     4     4     4     4     4     4     4     4     4     4     3     3		

## **BIOSYSTEMS ENGINEERING DESIGN ELECTIVES**

## Students are required to take 3 BIOE design electives. Specific courses are required if a Specialization is

BIOE design electives are typically offered in a two-year rotation. The department will ensure that design electives satisfying each of the three specializations are offered each academic year.

BIOE Design Electives (General Program)				
Course #	Course Title	СН	Prerequisites	
BIOE 4390	Unit Operations 1	4	BIOE 2790, BIOE 3320 (co-req), BIOE 3270 (co-req)	
BIOE 4412	Design of Light-Frame Building	4	BIOE 2110, BIOE 3590	
BIOE 4414	Imaging & Spectroscopy for Biosystems	4	BIOE 3270	
BIOE 4420	Crop Preservation	4	BIOE 2110	
BIOE 4440	Bioprocessing for Biorefin	4	BIOE 2110, BIOE 3320 (co-req)	
BIOE 4460	Air Pollution Assessment & Management	4	BIOE 2790 or MECH 2262	
BIOE 4560	Structural Design in Wood	4	BIOE 3590 or CIVL 3770	
BIOE 4590	Management of By-Products from Animal Production	4	BIOE 2790 or MECH 2262	
BIOE 4600	Design of Water Management System	4	SOIL 4060 or CIVL 3730	
BIOE 4610	Design of Assistive Technology Devices	4	BIOL 1412	
BIOE 4620	Remediation Engineering	4	BIOE 2790	
BIOE 4640	Bioengineering Applications in Medicine	4	BIOL 1410, BIOL 1412, BIOE 3320	
BIOE 4650	Textiles in Healthcare and Medical Applications	4	BIOE 2590, BIOE 3320 (co-req)	

Biomedical Specialization Design Electives (select 3 courses)				
Course #	Course Title	СН	Prerequisites	
BIOE 4414	Imaging & Spectroscopy for Biosystems	4	BIOE 3270	
BIOE 4610	Design of Assistive Technology Devices	4	BIOL 1412	
BIOE 4640	Bioengineering Applications in Medicine	4	BIOL 1410, BIOL 1412, BIOE 3320	
BIOE 4650	Textiles in Healthcare and Medical Applications	4	BIOE 2590, BIOE 3320 (co-req)	

Bioresource Specialization Design Electives (select 3 courses)				
Course #	Course Title	СН	Prerequisites	
BIOE 4390	Unit Operations 1	4	BIOE 2790, BIOE 3320 (co-req), BIOE 3270 (co-req)	
BIOE 4412	Design of Light-Frame Building	4	BIOE 2110, BIOE 3590	
BIOE 4420	Crop Preservation	4	BIOE 2110	
BIOE 4440	Bioprocessing for Biorefining	4	BIOE 2110, BIOE 3320 (co-req)	
BIOE 4560	Structural Design in Wood	4	BIOE 3590 or CIVL 3770	
BIOE 4590	Management of By-Products from Animal Production	4	BIOE 2790	
BIOE 4600	Design of Water Management System	4	SOIL 4060 or CIVL 3730	

Environmental Specialization Design Electives (select 3 courses)				
Course #	Course Title	CH	Prerequisites	
BIOE 4412	Design of Light-Frame Building	4	BIOE 2110, BIOE 3590	
BIOE 4460	Air Pollution Assessment & Management	4	BIOE 2790 or MECH 2262	
BIOE 4590	Management By-Products from Animal Production	4	BIOE 2790 or MECH 2262	
BIOE 4600	Design of Water Management System	4	SOIL 4060 or CIVL 3730	
BIOE 4620	Remediation Engineering	4	BIOE 2790 or MECH 2262	

Revised: May 30, 2023