UPEI Faculty of Sustainable Design Engineering (FSDE)
BSc Degree in Sustainable Design Engineering

PROGRAM INFO
2024-2025 Course Matrix

Four (4) Year Degree Plan

Term 1 (Year 1 - Fall Semester)		Sem Hrs	Term 2 (Year 1 - Winter Semester)		Sem Hrs
ENGN 1210	Engineering Communications	3	ENGN 1220	Engineering Analysis	3
ENGN 1230	Engineering Mechanics I: Statics	3	ENGN 1250	Materials Science	3
ENGN 1410	Sustainability in Engineering Design	3	ENGN 1310	Computer Programming	3
CHEM 1110	General Chemistry I	3	ENGN 1340	Engineering Mechanics II: Dynamics	3
MATH 1910	Single Variable Calculus I	4	MATH 1920	Single Variable Calculus II	4
MATH 2610	Linear Algebra	3	ENG 1010	Writing Studies (UPEI 1010)*	3
Term 3 (Year 2 - Fall Semester)			**Term 4 (Year 2 - Winter Semester)**		
ENGN 2210	Engineering Projects I	3	ENGN 2220	Engineering Projects II	3
ENGN 2310	Strength of Materials	3	ENGN 2130	Statistics for Engineering Applications	3
ENGN 2610	Thermo Fluids I: Thermodynamics	3	ENGN 2360	Materials, Mechanics and Manufacturing	3
ENGN 2810	Electric Circuits	3	ENGN 2620	Thermo Fluids II: Fluid Mechanics	3
MATH 2910	Multivariable and Vector Calculus	4	ENGN 2830	Digital Logic Design	3
IKE 1040	Indigenous Teachings	3	MATH 3010	Differential Equations	3
Term 5 (Year 3 - Fall Semester)			**Term 6 (Year 3 - Winter Semester)**		
ENGN 3710	Project-Based Professional Practice I	6	ENGN 3720	Project-Based Professional Practice II	6
ENGN 3220	Engineering Measurements	3	ENGN 3270	Machines and Automatic Control	3
ENGN 3630	Thermo Fluids III: Heat Transfer and Thermodynamic Cycles	3	ENGN 3430	Technology Management and Entrepreneurship	3
ENGN 3810	Systems Engineering	3	ENGN 3820	System Dynamics with Simulation	3
ENGN	Intro Focus Area Elective	3	ENGN	Focus Area Elective	3
Term 7 (Year 4 - Fall Semester)			**Term 8 (Year 4 - Winter Semester)**		
ENGN 4710	Project-Based Professional Practice III	6	ENGN 4720	Project-Based Professional Practice IV	6
ENGN 4210	Facilitated Study and Experimental Practice	3	ENGN	Focus Area Elective	3
ENGN 4850	Computational Methods for Engineering Design	3	COMP**	Complementary Studies Elective	3
ENGN	Focus Area Elective	3	COMP/SCI**	Complementary Studies or Science Elective	3
	Total Fall Semester Hours	71		Total Winter Semester Hours	70

Notes:

A 60% minimum grade is required in: ENGN 1210, 1220, 2210, 2220, 3710, 3720 and 4710 to proceed to the next course.

*UPEI 1010 is cross-listed with ENG 1010 - **search ENG 1010** in the course catalogue.

**Complementary Studies is considered to be any non-Engineering or non-Science course.

Elective Courses - Four (4) Year Degree Plan

Degree Focus Areas

Students in Program Years 3 and 4 can enhance their technical knowledge by choosing one of three engineering focus areas: **Mechatronics**, **Sustainable Energy**, **or Bioresources**. A minimum of 4 focus area (FA) electives must be taken. The first focus area elective (Term 5, Program Year 3) must be the introductory elective course in either Mechatronics (ENGN 3340), Sustainable Energy (ENGN 3440), or Bioresources (ENGN 3540). The remaining focus area electives in Terms 6, 7 and 8 can be selected from any of the available courses listed below in any of the three focus areas. At least one of the focus area electives must be at the 4000 level.

Intro Focus Area Electives		**Term 5 (Year 3 – Fall Semester)**
ENGN 3340	Introduction to Mechatronics Engineering	
ENGN 3440	Introduction to Sustainable Energy Engineering	
ENGN 3540	Introduction to Bioresources Engineering	
Focus Area Electives		**Term 6 (Year 3 – Winter Semester)**
ENGN 3370	Mechatronic System Integration and Interface Design	
ENGN 3380	Real-time Embedded Systems	
ENGN 3390	Intro to Mechatronic Computer-Aided Product Development, Modelling and Simulation	
ENGN 3450	Wind and Water Power	
ENGN 3460	Solar Energy and Electricity Storage	
ENGN 3490	Chemical Energy Conversion	
ENGN 3570	Engineering Applications of Biological Materials	
ENGN 3580	Soil Mechanics	
Focus Area Electives		**Term 7 (Year 4 – Fall Semester)**
ENGN 4310	Advanced Fabrication Techniques and Computer-Integrated Manufacturing	
ENGN 4320	Control System Design	
ENGN 4330	Innovations in Biomedical Engineering	
ENGN 4410	Macro Energy Systems	
ENGN 4440	Advanced Energy Storage	
ENGN 4510	Geoinformatics in Bioresources	
ENGN 4530	Fundamentals of Agricultural Machinery	
Focus Area Electives		**Term 8 (Year 4 – Winter Semester)**
ENGN 4350	Advanced Robotic Dynamics and Control	
ENGN 4370	Fluid Power Control	
ENGN 4450	Fluid Loads on Energy Structures	
ENGN 4470	Micro Grids	
ENGN 4550	Biotechnological Processes	
ENGN 4830	Biomedical Signal Processing	
ENGN 4840	Sustainable Technology Development and Commercialization	

Not all elective courses are offered every year. Courses are offered subject to enrollment and instructor availability.