UPEI Faculty of Sustainable Design Engineering (FSDE) **PROGRAM INFO**

BSc Degree in Sustainable Design Engineering **2024-2025 Course Matrix**

Five (5) 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 1410	Sustainability in Engineering Design	3	ENGN 1310	Computer Programming	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 1230	Engineering Mechanics I: Statics	3	ENGN 1250	Materials Science	3
ENGN 2810	Electric Circuits	3	ENGN 1340	Engineering Mechanics II: Dynamics	3
CHEM 1110	General Chemistry I	3	ENGN 2130	Statistics for Engineering Applications	3
MATH 2910	Multivariable and Vector Calculus	4	MATH 3010	Differential Equations	3
Term 5 (Year 3 - Fall Semester)			**Term 6 (Year 3 - Winter Semester)**		
ENGN 2210	Engineering Projects I	3	ENGN 2220	Engineering Projects II	3
ENGN 2310	Strength of Materials	3	ENGN 2360	Materials, Mechanics and Manufacturing	3
ENGN 2610	Thermo Fluids I: Thermodynamics	3	ENGN 2620	Thermo Fluids II: Fluid Mechanics	3
ENGN 3220	Engineering Measurements	3	ENGN 2830	Digital Logic Design	3
IKE 1040	Indigenous Teachings	3	ENGN 3270	Machines and Automatic Control	3
Term 7 (Year 4 - Fall Semester)			**Term 8 (Year 4 - Winter Semester)**		
ENGN 3630	Thermo Fluids III: Heat Transfer and Thermodynamic Cycles	3	ENGN 3430	Technology Management and Entrepreneurship	3
ENGN 3710	Project-Based Professional Practice I	6	ENGN 3720	Project-Based Professional Practice II	6
ENGN 3810	Systems Engineering	3	ENGN 3820	System Dynamics with Simulation	3
ENGN	Intro Focus Area Elective	3	ENGN	Focus Area Elective	3
Term 9 (Year 5 - Fall Semester)			**Term 10 (Year 5 - Winter Semester)**		
ENGN 4210	Facilitated Study and Experimental Practice	3	ENGN 4720	Project-Based Professional Practice IV	6
ENGN 4710	Project-Based Professional Practice III	6	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 each of 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 - Five (5) Year Degree Plan

Degree Focus Areas

Students in Program Years 3 and 4 can enhance their technical knowledge by choosing one of two engineering focus areas: **Mechatronics**, or **Sustainable Energy**. A minimum of 4 focus area (FA) electives must be taken. The first focus area elective (Term 7, Program Year 4) must be the introductory elective course in either Mechatronics (ENGN 3340), or Sustainable Energy (ENGN 3440). The remaining focus area electives in Terms 8, 9 and 10 can be selected from any of the available courses listed below in any of the two focus areas. At least one of the focus area electives must be at the 4000 level.

Intro Focus Area Electives		**Term 7 (Year 4 – Fall Semester)**
ENGN 3340	Introduction to Mechatronics Engineering	
ENGN 3440	Introduction to Sustainable Energy Engineering	
Focus Area Electives		**Term 8 (Year 4 – 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	
Focus Area Electives		**Term 9 (Year 5 – Fall Semester)**
ENGN 4310	Advanced Fabrication Techniques and Computer-Integrated Manufacturing	
ENGN 4320	Control System Design	
ENGN 4410	Macro Energy Systems	
ENGN 4330	Innovations in Biomedical Engineering	
ENGN 4440	Advanced Energy Storage	
Focus Area Electives		**Term 10 (Year 5 – Winter Semester)**
ENGN 4350	Advanced Robotic Dynamics and Control	
ENGN 4370	Fluid Power Control	
ENGN 4470	Micro Grids	
ENGN 4830	Biomedical Signal Processing	

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