

SUSTAINABLE PRODUCT DESIGN AND INNOVATION (B.S.)

Integrative Studies Requirements

40 credits minimum

Code	Title	Credits	Completed
Major Requirements (66 credits)			
<i>SPDI Core Courses</i>			
SPDI-110	Elect & Electronic Fund	4	_____
IISPD-151	Product Design Principles	4	_____
SPDI-180	Metal Procs & Proto	4	_____
SPDI-221	3-D CADD	4	_____
SPDI-302	Properties of Materials	2	_____
SPDI-304	Materials - a Life Cycle View	4	_____
SPDI-351	Product Design II	4	_____
<i>Management Core Courses</i>			
MGT-101	Introduction to Management	4	_____
MGT-140	Quantitative Decision-Making	4	_____
ACCT-215	Accounting for Decision Making	4	_____
Select one of the following:			4
MGT-331	Principles of Marketing		_____
MGT/SPDI-446	Competitive Manufacturing Mgt		_____
<i>SPDI/Management/Physics Electives</i>			
Select four credits of the following:			4
MGT-451	Business and Society		_____
INPHYS-131	Engineering Fundamentals		_____
SPDI-121	Design Vis in Pd & Eng		_____
SPDI-170	Intro Woodworking Tech		_____
INSPDI-183	Ultra-Precision Manufacturing		_____
SPDI-290	Special Topics		_____
SPDI-298	Independent Study		_____
SPDI-321	Advanced 3D CADD		_____

SPDI-330	Metrology & CMM		_____
SPDI-380	CAM/CNC		_____
INSPDI-385	Bio-Fabrication		_____
SPDI-410	Mechatronics and Automation		_____
SPDI-450	Product DfMA		_____
SPDI-456	Portfolio Design		_____
SPDI-490	Advance Special Topics		_____
SPDI-495	Seminar		_____
SPDI-498	Independent Study		_____

Required Allied Discipline Courses

IAART-103	3-D Design	4	_____
SAFE-215	Human Factors in Safety	4	_____

Select **at least one** of the following MATH courses:

MATH-111	Applied College Algebra		_____
MATH-112	Precalculus		_____
MATH-211	Calculus I		_____

SPDI Capstone Courses

SPDI-352	Product Design III	4	_____
SPDI-400	Manufacturing Enterprise	4	_____

Internships and/or Cooperative Education Experiences are recommended:

SPDI-294	Cooperative Education (counts toward elective credit)		_____
SPDI-494	Adv Cooperative Education (counts toward elective credit)		_____

Total Credits **66** _____

Options

The SPDI Major Pathway is cross-disciplinary and provides a strong foundation in the processes of New Product Design and Manufacturing while integrating Sustainability principles and decision-making methods. This Pathway allows for exploring other Minors and academic interests. While not required for the SPDI major, each student may choose one of the following other Pathways as Options. These Options are #General Engineering#and#Manufacturing Engineering. Courses for the option that also fulfill requirements for the SPDI major are not counted twice for overall college credit. Please note that some courses within the options may require prerequisite courses.

SPDI: Manufacturing Engineering Option

This option prepares students for career growth and flexibility in many aspects of 21st century manufacturing. Students electing the Manufacturing Engineering option will build on their SPDI major's knowledge and skills in design thinking, product design and

development processes, materials and manufacturing methods, business management, and sustainability, with additional cross-disciplinary courses in Mathematics, Physics, Chemistry, Computer Science, and Statistics. Students also have the opportunity to gain further knowledge and skills that create key competitive advantages in today's advanced manufacturing companies including LEAN manufacturing, advanced CAD, CAM, CNC programming, metrology, design for manufacturing and assembly, and mechatronics and automation. To fulfill the Manufacturing Engineering option students must take the following courses while fulfilling the requirements for the SPDI major. Failure to do so may impact time to graduation:

Code	Title	Credits	Completed
Manufacturing Engineering (minimum of 40 additional Credits)			
<i>Core Courses (20 Credits)</i>			
SPDI-321	Advanced 3D CADD ¹	4	_____
SPDI-330	Metrology & CMM ¹	2	_____
SPDI-380	CAM/CNC ¹	4	_____
SPDI-410	Mechatronics and Automation ¹	4	_____
SPDI-450	Product DfMA ¹	4	_____
SPDI-456	Portfolio Design ¹	2	_____
<i>Allied Courses (16 Credits)</i>			
INPHYS-141	College Physics I	4	_____
	or INPHYS-241 University Physics I		_____
PHYS-142	College Physics II	4	_____
	or PHYS-242 University Physics II		_____
ISCS-140	Programming Foundations I	4	_____
	or ISCS-210 Python Programming		_____
INCHEM-111	General Chemistry	4	_____
Select one of the following:			4
MATH-341	Applied Statistics		_____
ISMG-383	Applied Data Analysis & Vis		_____
IIPHYS-342	Data Analysis for Scientists		_____
Total Credits		40	_____

SPDI: General Engineering

This option can help prepare the student for career growth and flexibility related to new product design and development, engineering and manufacturing and for further academic study upon graduation in Engineering and Physics. Students electing the General Engineering Option will build on their SPDI major's knowledge and skills in design thinking, product design and development processes, materials and manufacturing methods, business management, and sustainability, with a strong crossdisciplinary foundation in Math and Physics and in other engineering related disciplines of chemistry, data analytics, and areas of interest. To fulfill this option students must take the following courses while fulfilling the requirements for the SPDI major. Failure to do so may impact time to graduation:

Code	Title	Credits	Completed
SPDI General Engineering Courses (Minimum of 36 Credits)			
SPDI Core Courses			
<i>Mathematics</i>			
MATH-212	Calculus II	4	_____
MATH-335	Linear Algebra	4	_____
<i>Physics</i>			
INPHYS-241	University Physics I	4	_____
PHYS-242	University Physics II	4	_____
<i>Chemistry</i>			
INCHEM-111	General Chemistry	4	_____
CHEM-112	Gen Chemistry II	4	_____
<i>Allied Courses</i>			
Select one of the following:			4
ISCS-210	Python Programming		_____
IIPHYS-342	Data Analysis for Scientists		_____
ISMG-383	Applied Data Analysis & Vis		_____
<i>Engineering Electives</i>			
Select two of the following:			8
PHYS-339	Classical Mechanics		_____
SPDI-410	Mechatronics and Automation ¹		_____
ARCH-375	Statics/Structural Analysis		_____
INOPTC-101	Introduction to Optics		_____
	or INOPTC-1 Laser Optics		_____
	or INOPTC-1:Thin Film in Optics		_____
MATH-311	Vector Calculus		_____
MATH-312	Differential Equations		_____
Total Credits		36	_____

Students are encouraged to complete a minor or an organized cluster of courses related to their career interests.

Electives

Select additional courses of your choice to bring total number of credits earned to 120.

Degree Requirements

120 credits

40 credits at the upper-level