INTEGRATED DESIGN, ENGINEERING, ARTS & SOCIETY MINOR

MINOR DESCRIPTION

The challenges of our society demand nimble students that utilize an integrated skill set. The Integrated Design, Engineering, Arts & Society (IDEAS) program prepares students to succeed at the intersection of design, the arts, and engineering in a liberal arts context. Students develop foundational knowledge in these areas by working in collaborative groups and individually on project-based assignments which emphasize making and doing as critical forms of knowledge. Core courses within the minor provide a foundation in the technical, aesthetic, and human dimensions of design and engineering. These courses are followed by a focus in one of many concentrations that span design and engineering disciplines.

ADMISSION TO THE MINOR

Students should complete at least one course from the required core courses to be admitted to the IDEAS minor. Declare the IDEAS minor through your WesPortal.

MINOR REQUIREMENTS

A minor in IDEAS requires seven credits. Comprised of three courses the IDEAS minor core is designed to introduce students to hands-on project-based studio, laboratory, and critical coursework in design and engineering. The remaining four elective courses come from course concentrations. Some courses offered on an irregular basis are not listed in concentrations, but may be used for electives subject to approval from the minor advisor.

STUDENT PORTFOLIO

All IDEAS minors will assemble a portfolio encompassing work developed within IDEAS courses. Students participating in the minor will begin the development of a digital and/or physical portfolio in the required project-based minor courses. In consultation with an advisor, projects will be added to this portfolio and reviewed before completion of the minor.

REQUIRED CORE COURSES

Students must complete one course from each group below.

Code	Title	Hours
One Engineering Foundations Lab		**1**
IDEA170	Introduction to Mechanical Design and Engineering	
IDEA175	Introduction to Electrical Design & Engineering	
One Introductory Design Studio		**1**
ARST235	Architecture I	
ARST220	Ecological Design I: Being at Home in the World	
ARST221	A Thousand Years of Iteration: Design for an Uncertain Future	
ARST271	Biodegradable Design: Soft and Hairy	
IDEA160	Product Design I	
IDEA185	Form and Code	
IDEA190	Digital Foundations	
IDEA236	Fast & Furious	
IDEA243	Introduction to Graphic Design	
IDEA285	Digital Projects Lab	
One Design & Technology Seminar		**1**
IDEA180	Design Studies	
Or another approved social science course		

ELECTIVE COURSES FROM CONCENTRATIONS:

The concentrations provide topical focus in the wide array of areas in Design, Engineering, Arts & Society. The IDEAS concentrations consist of four courses above the three required courses, to make the total of seven courses in the minor.

Some of the proposed concentrations include courses listed among those that will satisfy the gateway course distribution requirement listed above. Students will work with an advisor to help them achieve the appropriate depth of study in the concentration. Related courses that are not offered on a regular basis or course substitutions may be considered for minor credit, subject to review by the minor advisor. Typically, introductory (100-level) courses may not be counted toward the elective requirement.

ARTS AND DESIGN

The study of objects, their design, and technologies of production. This module consolidates project-based learning in architecture, product design and furniture design.

Code	Title	Hours
If not completed in the general requirements, three of the following design courses:		**3**
IDEA160	Product Design I	
ARST220	Ecological Design I: Being at Home in the World	
ARST221	A Thousand Years of Iteration: Design for an Uncertain Future	
ARST233	Studies in Computer-based Modelling and Digital Fabrication	
ARST235	Architecture I	
ARST236	Fast & Furious	
ARST271	Biodegradable Design: Soft and Hairy	
ARST320	Ecological Design II: Worn Out/Broken In	
ARST336	Architecture II	
ARST370	Product Design II	
IDEA210	How Things Fail: Mechanics and Materials	
THEA359	Space Design for Performance	
THEA185	Text & Visual Imagination: Introduction to Eco Design for Performance	
One course in the History of Architecture:		**1**
ARHA151	European Architecture and Urbanism to 1750	
ARHA210	Romanesque and Gothic Art and Architecture	
ARHA224	Italian Art and Architecture of the 16th Century	
ARHA244	European Architecture and Urbanism, 1750-1910	

ARHA246	American Architecture and Urbanism, 1770--1914
ARHA254	Architecture of the 20th Century
ARHA258	Contemporary World Architecture
ARHA284	Buddhist Art and Architecture in East Asia
ARHA352	Energy and Modern Architecture, 1850-2020

APPLIED MATH

Mathematical methods applied in science, engineering, computer science, and social science.

Code	Title	Hours
If not completed in the general requirements, two of the following engineering design courses:		**2**
IDEA170	Introduction to Mechanical Design and Engineering	
IDEA175	Introduction to Electrical Design & Engineering	
IDEA210	How Things Fail: Mechanics and Materials	
IDEA215	Introduction to Sensors, Measurement, and Data Analysis	
IDEA292	Interdisciplinary Project Lab	
One course in computing and programming foundations:		**1**
COMP112	Introduction to Programming	
COMP113	Bioinformatics Programming	
COMP114	How to Talk to Machines	
COMP115	How to Design Programs	
COMP211	Computer Science I	
PHYS340	Computational Physics	
One additional course from the following list:		**1**
MATH229	Differential Equations	
MATH231	An Introduction to Probability	
MATH232	Mathematical Statistics	
PHYS213	Waves and Oscillations	
PHYS217	Nonlinear Dynamics and Chaos	
PHYS565	Mathematical Physics	

BIOLOGICAL OR BIOCHEMICAL

Applications of biology and biochemistry to solve challenges in life and health sciences.

Code	Title	Hours
If not completed in the general requirements, one of the following engineering design courses:		**1**
IDEA170	Introduction to Mechanical Design and Engineering	
IDEA175	Introduction to Electrical Design & Engineering	
IDEA210	How Things Fail: Mechanics and Materials	
IDEA215	Introduction to Sensors, Measurement, and Data Analysis	
IDEA292	Interdisciplinary Project Lab	
One course in computing and programming foundations:		**1**
COMP112	Introduction to Programming	
COMP113	Bioinformatics Programming	
COMP114	How to Talk to Machines	
COMP115	How to Design Programs	
COMP211	Computer Science I	
PHYS340	Computational Physics	
Two additional courses from the following list:		**2**
BIOL212	Principles and Mechanisms of Cell Biology	
BIOL265	Bioinformatics Programming	
BIOL310	Genomics Analysis	
CHEM396	Molecular Modeling and Design	
IDEA261	Science Materials For a Malagasy Classroom	
MB&B228	Introductory Medical Biochemistry	
MB&B325	Introduction to Biomolecular Structure	
MB&B377	Advanced Genetics	
MB&B381	Physical Chemistry for the Life Sciences	

CHEMICAL

Applications of chemistry to the design of new chemicals, materials, and energy production.

Code	Title	Hours
If not completed in the general requirements, one of the following engineering design courses:		**1**
IDEA170	Introduction to Mechanical Design and Engineering	
IDEA175	Introduction to Electrical Design & Engineering	
IDEA210	How Things Fail: Mechanics and Materials	
IDEA215	Introduction to Sensors, Measurement, and Data Analysis	
IDEA292	Interdisciplinary Project Lab	
One course in computing and programming foundations:		**1**
COMP112	Introduction to Programming	
COMP113	Bioinformatics Programming	
COMP114	How to Talk to Machines	
COMP115	How to Design Programs	
COMP211	Computer Science I	
PHYS340	Computational Physics	
Two additional courses from the following list:		**2**
CHEM251	Principles of Organic Chemistry I	
CHEM252	Principles of Organic Chemistry II	
CHEM337	Physical Chemistry I: Quantum Mechanics and Spectroscopy	
CHEM338	Physical Chemistry II: Thermodynamics, Statistical Mechanics, and Kinetics	
CHEM377	Chemistry of Materials and Nanomaterials	
CHEM381	Physical Chemistry for the Life Sciences	
CHEM396	Molecular Modeling and Design	

COMPUTER

Applications of computer science to the design of new computer hardware and software.

Code	Title	Hours
If not completed in the general requirements, one of the following engineering design courses:		**1**
IDEA170	Introduction to Mechanical Design and Engineering	
IDEA175	Introduction to Electrical Design & Engineering	
IDEA215	Introduction to Sensors, Measurement, and Data Analysis	

IDEA292	Interdisciplinary Project Lab	
One course in computing and programming foundations:		**1**
COMP112	Introduction to Programming	
COMP113	Bioinformatics Programming	
COMP114	How to Talk to Machines	
COMP115	How to Design Programs	
COMP211	Computer Science I	
PHYS340	Computational Physics	
Two additional courses from the following list:		**2**
IDEA285	Digital Projects Lab	
COMP212	Computer Science II	
COMP301	Automata Theory and Formal Languages	
COMP312	Algorithms and Complexity	
COMP321	Design of Programming Languages	
COMP331	Computer Structure and Organization	
IDEA350	Computational Media: Videogame Development	

ELECTRICAL

Applications of electrical and magnetic systems to the design of new devices and communications.

Code	Title	Hours
If not completed in the general requirements, one of the following engineering design courses:		**2**
IDEA170	Introduction to Mechanical Design and Engineering	
IDEA175	Introduction to Electrical Design & Engineering	
IDEA215	Introduction to Sensors, Measurement, and Data Analysis	
IDEA292	Interdisciplinary Project Lab	
One course in computing and programming foundations:		**1**
COMP112	Introduction to Programming	
COMP113	Bioinformatics Programming	
COMP114	How to Talk to Machines	
COMP115	How to Design Programs	
COMP211	Computer Science I	
PHYS340	Computational Physics	
Two additional courses from the following list:		**2**
ASTR240	Radio Astronomy	
PHYS213	Waves and Oscillations	
PHYS214	Quantum Mechanics I	
PHYS324	Electricity and Magnetism	
PHYS342	Experimental Optics	
PHYS345	Electronics Lab	

ENVIRONMENTAL

Application of environmental and ecological knowledge to the protection of ecosystems and human population.

Code	Title	Hours
If not completed in the general requirements, one of the following engineering design courses:		**1**
IDEA170	Introduction to Mechanical Design and Engineering	
IDEA175	Introduction to Electrical Design & Engineering	
IDEA210	How Things Fail: Mechanics and Materials	
IDEA215	Introduction to Sensors, Measurement, and Data Analysis	
IDEA292	Interdisciplinary Project Lab	
One course in computing and programming foundations:		**1**
COMP112	Introduction to Programming	
COMP113	Bioinformatics Programming	
COMP114	How to Talk to Machines	
COMP115	How to Design Programs	
COMP211	Computer Science I	
PHYS340	Computational Physics	
Two additional courses from the following list:		**2**
BIOL216	Ecology	
E&ES244	Soils	
E&ES246	Hydrology	
E&ES250	Environmental Geochemistry	
E&ES253	Energy Sustainability: An examination of US, New England and Connecticut Energy	
E&ES280	Introduction to GIS	
E&ES361	Living in a Polluted World	
E&ES375	Modeling the Earth and Environment	

GEOMECHANICS/GEOSYSTEMS

Applications of geology and earth science to the development and preservation of subterranean resources.

Code	Title	Hours
If not completed in the general requirements, one of the following engineering design courses:		**1**
CIS170	Introduction to Mechanical Design and Engineering	
CIS175	Introduction to Electrical Design & Engineering	
IDEA210	How Things Fail: Mechanics and Materials	
IDEA292	Interdisciplinary Project Lab	
One course in computing and programming foundations:		**1**
COMP112	Introduction to Programming	
COMP113	Bioinformatics Programming	
COMP114	How to Talk to Machines	
COMP115	How to Design Programs	
COMP211	Computer Science I	
PHYS340	Computational Physics	
Two additional courses from the following list:		**2**
E&ES213	Mineralogy	
E&ES215	Earth Materials	
E&ES223	Structural Geology	
E&ES280	Introduction to GIS	
E&ES375	Modeling the Earth and Environment	

MATERIALS SCIENCE

Discovery, design, and properties of new materials.

Code	Title	Hours
If not completed in the general requirements, two of the following engineering design courses:		**2**

CIS170	Introduction to Mechanical Design and Engineering	
CIS175	Introduction to Electrical Design & Engineering	
IDEA215	Introduction to Sensors, Measurement, and Data Analysis	
One course in computing and programming foundations:		**1**
COMP112	Introduction to Programming	
COMP113	Bioinformatics Programming	
COMP114	How to Talk to Machines	
COMP115	How to Design Programs	
COMP211	Computer Science I	
PHYS340	Computational Physics	
One course in statics and dynamics:		**1**
IDEA210	How Things Fail: Mechanics and Materials	

MECHANICAL

Application of mechanics, kinematics, and thermodynamics to design and develop new mechanical systems.

Code	Title	Hours
If not completed in the general requirements, two of the following engineering design courses:		**2**
CIS170	Introduction to Mechanical Design and Engineering	
CIS175	Introduction to Electrical Design & Engineering	
IDEA215	Introduction to Sensors, Measurement, and Data Analysis	
One course in computing and programming foundations:		**1**
COMP112	Introduction to Programming	
COMP113	Bioinformatics Programming	
COMP114	How to Talk to Machines	
COMP115	How to Design Programs	
COMP211	Computer Science I	
PHYS340	Computational Physics	
One course is statics and dynamics:		**1**
IDEA210	How Things Fail: Mechanics and Materials	

PERFORMANCE DESIGN

Stage design for theater or dance, sets, costumes, and lighting.

Code	Title	Hours
Two courses from the following list:		**2**
THEA185	Text & Visual Imagination: Introduction to Eco Design for Performance	
ARST233	Studies in Computer-based Modelling and Digital Fabrication	
THEA305	Lighting Design for the Theater	
THEA360/ DANC364	Media for Performance	
THEA359	Space Design for Performance	
THEA383	Introduction to Costume Design for Performance	
One course in the History of Design:		**1**
ARHA244	European Architecture and Urbanism, 1750-1910	
ARHA246	American Architecture and Urbanism, 1770--1914	
ARHA254	Architecture of the 20th Century	
ARHA151	European Architecture and Urbanism to 1750	
One additional credit from the following list:		**1**
THEA434	Applied Scenography: From Idea to the Stage	
and		
THEA435	Performance Practice in Design A	
or		
THEA437	Performance Practice in Design B	

ADDITIONAL MINOR INFORMATION

- There may be prerequisite courses required for some of the courses listed above. These prerequisites do not count towards the minor.
- Some of the courses may be cross-listed with other departments; students can enroll in any listing for the specified course.
- Students may propose a different combination of elective courses in consultation with the IDEAS advisor.
- Some courses may overlap with existing major requirements. A student may only count three course credits toward the IDEAS minor that are also counted towards a major, linked major, certificate, or other minor, unless receiving explicit approval from the IDEAS minor administrator to waive this requirement.