

ENTREPRENEURSHIP AND INNOVATION, MINOR

Requirements for a minor may be completed at any campus location offering the specified courses for the minor. Students may not change from a campus that offers their major to a campus that does not offer their major for the purpose of completing a minor.

Program Description

Skills attributed to entrepreneurial behavior and innovative thinking are beneficial for students in most if not all majors, and are critical to career success in established companies and new organizations to address pressing needs around the globe. This interdisciplinary minor uses problem-based learning and other active learning pedagogies to prepare students to create value and be agents of positive change in their discipline and their careers. The courses develop skills, knowledge and values in problem solving, innovation, opportunity recognition, self-efficacy, leadership, ethics, communications and learning from failure. To meet the students' broad range of entrepreneurship and innovation interests, core courses (9 credits) establish foundational knowledge, and then students select a concentration cluster aligned to specific contexts such as entrepreneurship in food and bio-innovation, technology, bio-tech, the arts, media, hospitality, digital, social entrepreneurship, advocacy or new ventures. Students who complete the ENTI minor will be better prepared to be innovation leaders in their chosen career path, such as being entrepreneurial in an existing company (intrapreneurship), engaging in a start-up venture full or part-time, finding avenues to leverage their art or craft, or creating alliances to meet social or business needs.

Advising for students in this minor and approval of curriculum exceptions will be available through the Entrepreneurship and Innovation (ENTI) adviser for each cluster.

Bio-Tech Cluster (Eberly College of Science)

This specialization prepares students to develop an entrepreneurial mindset and apply innovative strategies to find solutions that benefit humans, animals, and the environment. Students will also develop unique skills in career readiness such as teamwork, leadership and communication. Students who complete this cluster will be better able to take an interdisciplinary approach to solving problems through Biotechnology.

Digital Entrepreneurship and Innovation Cluster (College of Information Sciences and Technology)

This specialization prepares a student to harness digital technologies and digital business models to develop their own concepts into commercial concerns or to contribute to the innovation activities of existing organizations (i.e., intrapreneurship). The IST Digital Entrepreneurship & Innovation cluster focuses on the impact of Information Technology (IT)-driven innovation across multiple industry sectors including for-profit, non-profit and governmental organizations. IT-driven innovation has created new business opportunities for both entrepreneurs and intrapreneurs and is key to increasing efficiencies and expanding the linkage between user-centric products and services. Students who complete this cluster will gain a foundational understanding of emerging information technologies, the components of digital business models, and implementation and design techniques that meet or exceed user-centric requirements.

Entrepreneurship as Advocacy Cluster (College of the Liberal Arts)

This specialization empowers students to utilize the process of entrepreneurship as a form of advocacy to improve the human condition and enhance public life. The cluster leverages a critique of the business paradigm of "maximize shareholder value" to encourage students to create organizations that can be a force for positive change in society.

Food and Bio-innovation Cluster (College of Agricultural Sciences)

This specialization will develop future entrepreneurs and innovators to address opportunities and challenges in the agriculture and life sciences space. The cluster focuses on the cornerstone challenge for agriculture: producing food for the world with entrepreneurial activity and innovation to develop, convert and use biological materials and natural resources (plants, animals, ecosystems and organisms, etc.) to meet the material and energy needs of society. Students are encouraged to take a series of courses in the cluster that complement their personal venture interests and engage in a series of immersive venturing experiences that can range from creating new ventures to mentoring with seasoned entrepreneurs or working within entrepreneurial organizations.

Hospitality Management Cluster (College of Health and Human Development)

This specialization prepares a student to create and develop novel but sound entrepreneurial concepts related to the hospitality industry in such businesses as lodging and food service. For example, through this cluster, students could develop and refine entrepreneurial concepts related to hotels, motels, bed & breakfasts, quick-service restaurants, upscale restaurants, mobile dining such as food trucks, on-line travel agencies, and other on-line ventures. The minor is also designed to prepare students to be innovators within existing organizations. Students who complete this cluster develop skills in creating business plans, feasibility studies, competitive analysis, supply and demand analysis, market analysis and financial forecasting. Students in this concentration are expected to include a mix of majors, not only students majoring in hospitality management.

New Media Cluster (College of Communications)

This specialization examines opportunities and challenges in the creation and distribution of news, entertainment and information. The same technological innovations that make it easy to start a media enterprise have introduced a host of editorial and business complexities. Media production and distribution skills and knowledge of media business, technologies, law and ethics are critical.

New Ventures Cluster (Smeal College of Business)

This specialization helps students develop the skills and ways of thinking required to create, develop, innovate and manage entrepreneurial companies. Students learn about acquiring and balancing limited resources, changing business direction quickly, building a coherent team, managing intellectual property, and creating new markets. This cluster develops a wide range of managerial skills not usually demanded in one person within a larger organization.

Product innovation Cluster (College of Engineering)

This specialization develops skills and knowledge through a practical entrepreneurial experience in a technology based environment. Technology and engineering design topics form the practical content of the cluster. General entrepreneurial business topics and tracking current

and emerging technologies provide additional foundation structure for this cluster. Students understand and apply fundamental engineering design skills, product feasibility analysis and marketing techniques to move innovative products toward commercialization.

Social Entrepreneurship Cluster (College of Engineering)

This specialization focuses on creating sustainable social impact within marginalized communities. The cluster grounds students in social business, user-centered design for extreme affordability, systems thinking and scholarly research to develop innovative and appropriate technology-based solutions to address compelling global challenges. Travel and fieldwork in which students work in multidisciplinary teams to research, design, test, and commercialize ventures are required.

What is Entrepreneurship and Innovation?

Entrepreneurship and innovation is an interdisciplinary field that deals with new enterprise creation and the process of change and transformation in methods, ideas, and products. It is about problem-solving and the creation of value and positive change in business and society.

You Might Like This Program If...

- You want to learn what entrepreneurs do and how innovators create and solve problems in any field. Whatever you're majoring in or whatever career you've chosen, entrepreneurs and innovators are there already making a positive difference. You can learn to be one, too.
- You're passionate about starting your own business, non-profit, or social enterprise (entrepreneurship) or pursuing a career as an innovator within an existing firm or organization (intrapreneurship).
- You want to learn the skills and develop the mindset of an entrepreneur and innovator.

MORE INFORMATION ABOUT ENTREPRENEURSHIP AND INNOVATION (<https://cpsse.psu.edu/enti/>)

Program Requirements

Requirement	Credits
Requirements for the Minor	18-19

Requirements for the Minor

A grade of C or better is required for all courses in the minor, as specified by Senate Policy 59-10 (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/59-00-minors-and-certificates/#59-10>). In addition, at least six credits of the minor must be unique from the prescribed courses required by a student's major(s).

Code	Title	Credits
Prescribed Courses		
<i>Prescribed Courses: Require a grade of C or better</i>		
ENGR 310	Entrepreneurial Leadership	3
ENGR/IST/MGMT 425	New Venture Creation	3
MGMT 215	Entrepreneurial Mindset	3
Additional Courses		
<i>Additional Courses: Require a grade of C or better</i>		
Select 9 or more credits from one of the clusters listed below ¹		9-10

¹ Students may not use a required course from their major in their chosen cluster. Other courses, such as technical electives, out-of-college electives, and general education courses may be able to be used to meet requirements in major as well as the ENTI Minor. In all clusters, students may substitute up to 3 credits of research topics, internship or independent studies courses focused on relevant entrepreneurship or innovation topics in consultation with an adviser. Each cluster is structured to provide a clear course "path" so any student from any major can complete the cluster and therefore the ENTI minor.

Bio-Tech Cluster

Code	Title	Credits
Required Courses		
Choose one foundational course for the Bio-Tech cluster from the following list:		3-4
BIOL 230W	Biology: Molecules and Cells	
BIOL 230M	Honors Biology: Molecules and Cells	
BMB/MICRB 251	Molecular and Cell Biology I	
BMB 251H	Molecular and Cell Biology I	
MICRB 201	Introductory Microbiology	
MICRB 201H	Introductory Microbiology	
Choose one of the following advanced courses for the Bio-Tech cluster:		3-4
BIOL 405	Molecular Evolution	
BIOL 409	Biology of Aging	
BIOL 412	Ecology of Infectious Diseases	
BIOL 415	Ecotoxicology	
BIOL 416	Biology of Cancer	
BIOL 419	Ecological and Environmental Problem Solving	
BIOL 419H	Ecological and Environmental Problem Solving	
BIOL 424	Seeds of Change: The Uses of Plants	
BIOL 426	Developmental Neurobiology	
BIOL 431	Reproductive Biology	
BIOL 432	Developmental Genetics	
BIOL 439	Practical Bioinformatics	
BIOL 443	Evo-devo: Evolution of Developmental Mechanisms	
BIOL 451	Biology of RNA	
BIOL/ANTH 460	Human Genetics	
BIOL 461	Contemporary Issues in Science and Medicine	
BIOL 467	Molecular Basis of Neurological Diseases	
BIOL/BBH 469	Neurobiology	
BIOTC/BIOL/HORT 459	Plant Tissue Culture and Biotechnology	
BIOTC/AGRO 460	Advances and Applications of Plant Biotechnology	
BMB 401	General Biochemistry	
BMB 442	Laboratory in Proteins, Nucleic Acids, and Molecular Cloning	
BMB/MICRB 480	Cancer Development and Progression	
BMB 482	Introduction to Computational Biology	

BMB 484	Functional Genomics	
BMB/VBSC 485	Human Genomics and Biomedical Informatics	
CHEM 402	Environment Chemistry: Atmosphere	
CHEM 423W	Chemical Spectroscopy	
CHEM 425W	Chromatography and Electrochemistry	
CHEM 431W	Advanced Synthetic Methodologies	
CHEM 459W	Advanced Experimental Physical Chemistry	
CHEM 476	Biological Chemistry	
FRNSC 427W	Forensic Chemistry	
MATH 405	Advanced Calculus for Engineers and Scientists I	
MATH 406	Advanced Calculus for Engineers and Scientists II	
MATH 448	Mathematics of Finance	
MATH 450	Mathematical Modeling	
MATH 484	Linear Programs and Related Problems	
MATH 486	Mathematical Theory of Games	
MICRB 401	Microbial Physiology and Structure	
PHYS 462	Applications of Physics in Medicine	
PHYS 465	Network analysis of biological systems	
PHYS 472	Elements of Nuclear Physics and its Applications to Medical Imaging and Treatments	
Choose one of the following capstone courses for the Bio-Tech cluster. ¹		3
BIOTC/MICRB 416	Microbial Biotechnology	
BIOTC/BIOL/HORT 459	Plant Tissue Culture and Biotechnology	

¹ Note: if a course is taken to satisfy 400-level elective, it cannot also be used to satisfy capstone requirement.

Digital Entrepreneurship and Innovation Cluster

Code	Title	Credits
Required Courses		
IST 237	Digital Entrepreneurship	3
IST 337	Technologies for Digital Entrepreneurs	3
IST 437	Digital Design & Innovation ¹	3

¹ IST 237 is prerequisite for IST 437.

Entrepreneurship as Advocacy Cluster

Code	Title	Credits
Required Courses		
LA 202	Innovation and Entrepreneurship in the Liberal Arts ¹	3
LA 424	Liberal Arts Venture Development ¹	3
Select 3 credits from the following:		3
AFAM 100N	Black Freedom Struggles	
AFAM/SOC/WMNST 103	Racism and Sexism	
AFAM/LHR/WMNST 136	Race, Gender, and Employment	
AFAM/HIST/WMNST 213Y	African American Women's History	

CAS/ENGL 137H	Rhetoric and Civic Life I	
CAS 175N	Persuasion and Propaganda	
CAS 210	Landmark Speeches on Democracy and Dissent	
CAS 220	Persuasion	
CAS 222N/AYFCE 211N/CIVCM 211N	Foundations: Civic and Community Engagement	
CAS 321	Rhetoric and Law	
CAS 373	The Rhetorics of War and Peace	
ENGL 162N	Communicating Care	
ENGL 228	Introduction to Disability Studies in the Humanities	
ENGL 236N	Inequality: Economics, Philosophy, Literature	
LHR 100	Exploring Work and Employment	
LHR 201	Employment Relationship: Law and Policy	
PLSC 202	American Public Policy	
PLSC 210N	Rights in America	
PLSC 291	Introduction to Peace and Conflict Studies	
PSYCH 100	Introductory Psychology	
SOC 1	Introductory Sociology	
SOC 5	Social Problems	
SOC/CRIM/CRIMJ 12	Criminology	
SOC 23	Population and Policy Issues	
WMNST 100	Introduction to Women's and Gender Studies	
WMNST 105N	Living in a Diverse World	
WMNST 200	Global Feminisms	

¹ LA 202 and LA 424 should be taken in sequence.

Food and Bio-innovation Cluster

Code	Title	Credits
Required Courses		
Select up to 6 credits of the following 200-300 level courses in the College of Agricultural Sciences:		6
AEE 201	Interpersonal Skills for Tomorrow's Leaders	
AEE 360	Leadership Development for Small Groups	
AGBM 200	Introduction to Agricultural Business Management	
AGBM 302	Food Product Marketing	
AGBM 308W	Strategic Decision Making in Agribusiness	
AGBM 338	Agribusiness in the Global Economy	
ANSC 201	Animal Science	
ANSC 306	Swine Production and Management	
ANSC 308	Sheep and Goat Production and Management	
ANSC 309	Beef Cattle Production and Management	
ANSC 310	Dairy Cattle Production and Management	
ANSC 311	Poultry Production and Management	
ANSC 324	Value Determination of Meat Animals	
ANSC 327	Horse Production and Management	
ANSC 346	Animal Enterprise Analysis	
ANSC 350	Dairy Problem Solving	
BE/ABSM 391	Communication Skills for BE and ABSM Students	
BE/ABSM 392	Leadership and Ethics for BE and ABSM Students	

CED 375	Community, Local Knowledge, and Democracy	
ERM 300	Basic Principles and Calculations in Environmental Analysis	
FDSC 200	Introductory Food Science	
FDSC 206	Improving Food Quality	
FORT 250	Forest Management Practices	
HORT 250	Landscape Contracting Design/Build Principles	

Select at least 3 credits of the following 400 level courses in the College of Agricultural Sciences: 3

ABSM/ERM 402	Foundations of Sustainable Business	
ABSM 429	Agricultural and Biorenewable Systems Analysis and Management	
AEE 460	Foundations in Leadership Development	
AGBM 407	Farm Planning and Financial Management	
AGBM 408	Financial Decision Making for Agribusiness	
AGBM 440	Food Product Innovation Management	
AGBM 445	AgTech Entrepreneurship	
AGBM/HORT 455	Retail Horticulture Business Management	
AGBM 460	Managing the Food System	
ANSC 410	Advanced Dairy Herd Management	
ANSC 429	Advanced Beef Cattle Production	
ANSC 450	Dairy Farm Management Systems	
BRS 437	Bioproduct Marketing and Sales	
CED 417	Power, Conflict, and Community Decision Making	
CED 425	International Community and Economic Development	
CED 430W	Principles of Community Economic Development	
ERM 411	Legal Aspects of Resource Management	
ERM 412	Resource Systems Analysis	
ERM 413W	Case Studies in Ecosystem Management	
FDSC 411	Managing Food Quality	
FDSC 430	Unit Operations in Food Processing	
FDSC 444	Arguing about Food	
FDSC 450	Food Innovation and Product Design	
FDSC/INTAG 460	International Food Production	
FOR 440	Forest and Conservation Economics	
HORT 410W	Issues in Landscape Contracting	
HORT 453	Flower Crop Production and Management	
HORT/AGBM 455	Retail Horticulture Business Management	
TURF 436W	Case Studies in Turfgrass Management	

Hospitality Management Cluster

Code	Title	Credits
HM 484	Hospitality Entrepreneurship and Innovation	3
Select 6 credits from the following:		6
HM 382	Franchising in the Hospitality Industry	
HM 407	The Sustainable Fork: Food Systems Decisions for Away-From-Home Eating	
HM 435	Hospitality Corporate Finance	

HM 482	Hospitality Real Estate	
HM 485	Advanced Meeting and Event Management	
HM 488	Hospitality Asset Management	

New Media Cluster

Code	Title	Credits
Required Courses		
COMM 271	Principles of Journalism	3
Select 6 credits from the following:		6
COMM 361	Entrepreneurial Journalism	
COMM 362	Podcasting	
COMM 384	Telecommunications Promotion and Sales	
COMM 461A	Digital Magazine Production	
COMM 462	Feature Writing	
COMM 483	Wireless Communications Industry	
COMM 484	Emerging Telecommunications Technologies	
COMM 492	Internet Law and Policy	
COMM 493	Entrepreneurship in the Information Age	

New Ventures Cluster

Code	Title	Credits
Required Courses		
Select 6-7 credits from the following category: ¹		6-7
BA 241 & BA 242	Legal Environment of Business and Social and Ethical Environment of Business	
or BA 243	Social, Legal, and Ethical Environment of Business	
or BLAW 243	Legal Environment of Business	
or BLAW 341	Business Law I: Introduction to Contracts, Liability Issues, and Intellectual Property	
BA 250	Small Business Management	
BA 322	Negotiation Skills for Business Professionals	
MGMT 365	Social Entrepreneurship	
MGMT/ENGR/IST 426	Invention Commercialization	
MGMT 427	Managing an Entrepreneurial Start-Up Company	
MGMT 427W	Managing an Entrepreneurial Start-up	
MGMT 451	Business, Ethics, and Society	
MGMT 451W	Business, Ethics, and Society	
MGMT 453	Creativity and Innovation	
Select 3 credits from the following category: ¹		3
MGMT 426	Invention Commercialization	
MGMT 427	Managing an Entrepreneurial Start-Up Company	
MGMT 427W	Managing an Entrepreneurial Start-up	
MGMT 451	Business, Ethics, and Society	
MGMT 451W	Business, Ethics, and Society	
MGMT 453	Creativity and Innovation	

¹ Courses cannot double count in these categories.

Product Innovation Cluster

Code	Title	Credits
Required Courses		
ENGR 407	Technology-Based Entrepreneurship	3
ENGR 411	Entrepreneurship Business Basics	3

Select 3 credits from the following:	3
EDSGN 367 Design Thinking and Making	
EDSGN 467 Prototyping to Launch	
ENGR 408 Leadership Principles	
ENGR 415 Launching Innovation: Ideas to Opportunities	

Social Entrepreneurship Cluster

Code	Title	Credits
Required courses to be taken in the following order:		
ENGR 451	Social Entrepreneurship	3
EDSGN 452	Projects in Humanitarian Engineering	2
EDSGN 453	Design for Developing Communities	1
EDSGN 454	Humanitarian Engineering and Social Entrepreneurship Field Experience	0.5
ENGR 455	Humanitarian Engineering and Social Entrepreneurship Reflection and Research Dissemination	3

Academic Advising

The objectives of the university's academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee's unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy/>)

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