

INTERDISCIPLINARY SCIENCE AND BUSINESS, B.S.

Begin Campus: Any Penn State Campus

End Campus: Erie

Program Description

This major provides students with an interdisciplinary program containing both science and business course content. The major includes a set of core courses in both science and business that should enable a graduate to function effectively in a business environment that involves science applications or knowledge. A student will be able to choose from a selection of science and business modules that will enable a student to function in specific science and business areas. Each student will choose one science module and one business module. The modules will be approved by both the Schools of Science and Business and will provide an entry-level set of skills that will help graduates provide immediate value as an employee. In addition, the program develops written and oral communication skills from an early stage and culminates in a capstone experience, or an independent study of internship experience that stresses communication, strategic product development, and product realization.

What is Interdisciplinary Science and Business?

Health-care centers, pharmaceutical companies, tech firms, and research facilities are changing our lives every day. Those organizations are based in science but rely on business experts to oversee sales, finances, marketing, supply chains, and more. That's where the B.S. in Interdisciplinary Science and Business has its roots—preparing you to work on the business side of a science-based organization.

You'll build a foundation in science with core classes, then choose a specialized path in either quantitative science, laboratory science, or human health, depending on your personal interests and career goals. Likewise, you'll study the fundamentals of business before choosing to specialize in either accounting and finance, technical sales, or operations and supply chain management.

You Might Like This Program If...

- You have both a brain for business and an interest in understanding the world around you—specifically the scientific world.
- You have wide-ranging interests and can picture yourself working in a variety of career fields.
- You are curious about both science and business and don't both fields fitting into a traditional degree—and see the appeal of a program that is unique to you.

Entrance to Major

To be eligible for the Interdisciplinary Science and Business (ISB) major, students must:

- Have completed the following entrance-to-major requirements with a grade of C or better in each:
 - ACCTG 211
 - BIOL 110 or (CHEM 106 and CHEM 111) or (CHEM 110 and CHEM 111) or PHYS 250

- ECON 102
- ENGL 15 or ENGL 30H
- MATH 83 or MATH 110 or MATH 140
- SCM 200 or STAT 200 or STAT 250
- Have achieved a minimum cumulative grade point average of 2.00 prior to and through the end of the semester during which the entrance to major is requested.

Degree Requirements

For the Bachelor of Science degree in Interdisciplinary Science and Business, a minimum of 124 credits is required:

Requirement	Credits
General Education	45
Requirements for the Major	106-113

27 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 9 credits of GN courses, 6 credits of GQ courses, 6 credits of GS courses, 6 credits of GWS courses.

Per Senate Policy 83.80.5, the college dean or campus chancellor and program faculty may require up to 24 credits of coursework in the major to be taken at the location or in the college or program where the degree is earned.

Requirements for the Major

Each student must earn at least a C or better in each 300- and 400-level course in the major field.

A grade of C or better is required for all courses in the major. To graduate, a student enrolled in the major must earn at least a C grade in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44>).

Code	Title	Credits
Prescribed Courses		
<i>Prescribed Courses: Require a grade of C or better</i>		
ACCTG 211	Financial and Managerial Accounting for Decision Making	4
BA 241	Legal Environment of Business	2
BA 242	Social and Ethical Environment of Business	2
BIOL 110	Biology: Basic Concepts and Biodiversity	4
CAS 100	Effective Speech	3
CHEM 111	Experimental Chemistry I	1
ECON 102	Introductory Microeconomic Analysis and Policy	3
ECON 104	Introductory Macroeconomic Analysis and Policy	3
ENGL 202C	Effective Writing: Technical Writing	3
FIN 301	Corporation Finance	3
ISB 207	Integrating Science and Business	1
ISB 475W	Strategic Integration of Science & Business	3
MIS 204	Introduction to Management Information Systems	3
MGMT 301	Basic Management Concepts	3
MGMT 410	Project Management	3
MKTG 301	Principles of Marketing	3
PSU 7	First-Year Seminar Behrend	1
SCM 301	Supply Chain Management	3

Additional Courses*Additional Courses: Require a grade of C or better*

CHEM 106	Introductory and General Chemistry	3-5
or CHEM 110	Chemical Principles I	

PHYS 250	Introductory Physics I	4
or CHEM 112 & CHEM 113	Chemical Principles II and Experimental Chemistry II	

Select one of the following:		4
------------------------------	--	---

MATH 83	Technical Calculus	
---------	--------------------	--

MATH 110	Techniques of Calculus I	
----------	--------------------------	--

MATH 140	Calculus With Analytic Geometry I	
----------	-----------------------------------	--

Select one of the following:		3-4
------------------------------	--	-----

SCM 200	Introduction to Statistics for Business	
---------	---	--

STAT 200	Elementary Statistics	
----------	-----------------------	--

STAT 250	Introduction to Biostatistics	
----------	-------------------------------	--

Supporting Courses and Related Areas*Supporting Courses and Related Areas: Require a grade of C or better*

Select 15-16 credits from one business module from School Approved List ¹	15-16
--	-------

Select 29-32 credits from one science module from School Approved List ¹	29-32
---	-------

¹ Except where noted, courses taken to satisfy General Education requirements may not be used to satisfy module requirements.

General Education

Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (<https://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program/>) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required and Inter-Domain courses do not meet this requirement.)

- **Quantification (GQ):** 6 credits
- **Writing and Speaking (GWS):** 9 credits

Breadth in the Knowledge Domains (Inter-Domain courses do not meet this requirement.)

- **Arts (GA):** 3 credits
- **Health and Wellness (GHW):** 3 credits
- **Humanities (GH):** 3 credits
- **Social and Behavioral Sciences (GS):** 3 credits
- **Natural Sciences (GN):** 3 credits

Integrative Studies

- **Inter-Domain Courses (Inter-Domain):** 6 credits

Exploration

- **GN**, may be completed with Inter-Domain courses: 3 credits
- **GA, GH, GN, GHW, Inter-Domain courses.** This may include 3 credits of World Language course work beyond the 12th credit level or the requirements for the student's degree program, whichever is higher: 6 credits

University Degree Requirements**First Year Engagement**

All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement

6 credits are required and may satisfy other requirements

- United States Cultures: 3 credits
- International Cultures: 3 credits

Writing Across the Curriculum

3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits

A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

Quality of Work

Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition

The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (<https://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80>)). For more information, check the Suggested Academic Plan for your intended program.

Program Learning Objectives

- **Communication:** Communicating and illustrating complex ideas that require an understanding of both science and business.
- **Evaluation:** Envisioning, designing, and evaluating new products or procedures relevant for science-based businesses.
- **Extending Essential Knowledge:** Extending this essential knowledge in specific areas of science and business in an effort to develop solutions to issues relevant to science-based businesses.
- **Understanding Essential Concepts:** Understanding of the essential concepts of mathematics, statistics, science and business in order to

relate these concepts to cases and situations requiring an expertise in both business and science.

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/>)

Erie

Michael Rutter, Ph.D.

Associate Professor of Statistics
3B Prischak
Erie, PA 16563
814-898-6272
mar36@psu.edu

Diane Parente, Ph.D.

Samuel A. and Elizabeth B. Breene Professor of Business and Management
254 Burke
Erie, PA 16563
814-898-6436
dhp3@psu.edu

Suggested Academic Plan

The suggested academic plan(s) listed on this page are the plan(s) that are in effect during the 2023-24 academic year. To access previous years' suggested academic plans, please visit the archive (<https://bulletins.psu.edu/undergraduate/archive/>) to view the appropriate Undergraduate Bulletin edition (*Note: the archive only contains suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin*).

Interdisciplinary Science and Business, B.S. at Erie Campus

The course series listed below provides **only one** of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an **Academic Requirements** or **What If** report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

First Year

Fall	Credits Spring	Credits
MATH 140 or 110 (GQ) ^{*#†}	4 STAT 200, 250, or SCM 200 (GQ) ^{*#†}	3-4

BIOL 110 (GN) ^{*#†}	4 PHYS 250 or CHEM 112 <i>and</i> CHEM 113 (GN) ^{*#†}	4
CHEM 110 & CHEM 111 (GN) ^{*#†}	4 ECON 102 (GS) ^{*#†}	3
ENGL 15 or 30H (GWS) ^{‡#†}	3 MIS 204 [*]	3
PSU 7 [*]	1 CAS 100 (GWS) ^{*††}	3
	16	16-17

Second Year

Fall	Credits Spring	Credits
MKTG 301 [*]	3 FIN 301 [*]	3
ACCTG 211 ^{*#}	4 ENGL 202C (GWS) ^{*††}	3
BA 242 [*]	2 SCM 301 [*]	3
BA 241 [*]	2 Science Module ^{*1}	3
ISB 207 [*]	1 Science Module ^{*1}	3-4
General Education Course (GA/GH/GHW)	3	
	15	15-16

Third Year

Fall	Credits Spring	Credits
ECON 104 (GS) ^{*†}	3 Business Module ^{*1}	3
MGMT 301 [*]	3 Business Module ^{*1}	3
Science Module ^{*1}	3 Science Module ^{*1}	3-4
Science Module ^{*1}	3 Science Module ^{*1}	3
Business Module ^{*1}	3 General Education Course (GA/GH/GHW)	3
General Education Course (GA/GH/GHW)	3	
	18	15-16

Fourth Year

Fall	Credits Spring	Credits
MGMT 410 [*]	3 ISB 475W [*]	3
Science Module ^{*1}	3 Science Module ^{*1}	3
Business Module ^{*1}	3-4 Science Module ^{*1}	3
Business Module ^{*1}	3 General Education Course (GA/GH/GHW)	3
Science Module ^{*1}	3 General Education Course (GA/GH/GHW)	3
	15-16	15

Total Credits 125-129

- * Course requires a grade of C or better for the major
- ‡ Course requires a grade of C or better for General Education
- # Course is an Entrance to Major requirement
- † Course satisfies General Education and degree requirement

¹ For the current list of Science and Business module courses, please contact Dr. Michael Rutter (mar36@psu.edu) or Dr. Diane Parente (dhp3@psu.edu)

University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity Requirements (United States and International Cultures).

W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

Program Notes:

- **School Approved Lists for Science Modules**
 - **Human Health Module (required 23 credits):** BIOL 230W, BIOL 220W, KINES 203, MICRB 201, MICRB 202, BIOL 421, BIOL 472. Select an additional nine credits from the following: BIOL 416, BIOL 322, MICRB 410, BIOL 430, BMB 400, CHEM 472.
 - **Laboratory Science Module (required 18-19 credits):** CHEM 210, CHEM 212, CHEM 227, CHEM 440, CHEM 441, MICRB 106 and MICRB 107 or MICRB 201 and MICRB 202. Select an additional eleven credits from the following: BIOL 220W, BIOL 230W, BIOL 240W, BIOL 322, BIOL 416, BIOL 460, BMB 401 or CHEM 472, BMB 406, BMB 442, BMB 465, BMB 484, CHEM 408, CHEM 413, CHEM 430, CHEM 432, CHEM 446, CHEM 450 or BMB 428, CHEM 452, CHEM 457, MICRB 410, CHEM 494 or BIOL 494 or MICRB 494.
 - **Quantitative Module (required 9 credits):** CMPSC 101 or CMPSC 121 or CMPSC 131 or CMPSC 200 or CMPSC 201, STAT 461, STAT 462. Select an additional twenty-one credits from the following: DIGIT 410, ECON 481, ECON 485, MATH 482, MIS 315, MIS 336, MIS 345, STAT 318, STAT 414, STAT 464, STAT 466, STAT 494 or MATH 494.
- **School Approved Lists for Business Modules**
 - **Accounting and Finance (required 10 credits):** ACCTG 305, ACCTG 340, and FIN 451. Select an additional six credits from the following: any other 400-level ACCTG and FIN courses.
 - **Technical Sales (required 9 credits):** MKTG 410, SCM 455, SCM 460. Select an additional six credits from the following: MIS 404, MKTG 485, ACCTG 340.
 - **Operations and Supply Chain Management (required 9 credits):** SCM 445, SCM 455, SCM 460. Select an additional six credits from the following: ECON 485, MKTG 485, MIS 404, MIS 336.
- For updates to the list of Science and Business module courses, please contact Dr. Michael Rutter (mar36@psu.edu) or Dr. Diane Parente (dhp3@psu.edu).

Advising Notes:

- Students are encouraged to meet their general education requirements of inter-domain and linked courses in their general education credits.
- Students are encouraged to complete the US and IL general education requirements as part of their general education course selections.

Career Paths

As science, health-care, and technology business continue to grow, demand is expected to increase for employees who understand both what the business does and how to lead it—those with a deep

understanding of the science but also a specialization in sales, finance, marketing, or management.

Careers

Interdisciplinary Science and Business graduates can expect to find employment at laboratories, pharmaceutical companies, health-care facilities and medical practices, and environmental firms. Typical entry-level positions include sales representatives, analysts, managers, and specialists in purchasing, supply chain, or operations.

MORE INFORMATION ABOUT POTENTIAL CAREER PATHS FOR GRADUATES OF THE INTERDISCIPLINARY SCIENCE AND BUSINESS PROGRAM (<https://behrend.psu.edu/school-of-science/academic-programs/interdisciplinary-science-and-business/>)

Opportunities for Graduate Studies

Students interested in continuing studies could add to their specialization by pursuing in advanced degrees on either the science side or business side of their undergraduate degree.

MORE INFORMATION ABOUT OPPORTUNITIES FOR GRADUATE STUDIES (<https://behrend.psu.edu/admissions-financial-aid/graduate-degrees/>)

Contact Erie

SCHOOL OF SCIENCE
1 Prischak Building
Erie, PA 16563
814-898-6105
behrend-science@psu.edu

<http://behrend.psu.edu/school-of-science> (<http://behrend.psu.edu/school-of-science/>)