

Undergraduate Business Administration

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The Business Administration Major in the Tepper School of Business is for students interested in a broad undergraduate education based on management science, quantitative reasoning, leadership development, and communications skills. The curriculum is rigorous and flexible to accommodate student interests, academic, and career goals.

Students who complete the B.S. in Business Administration will be able to: i) Demonstrate a depth of knowledge in business functional areas; ii) Solve business problems using analytic methods; iii) Use diverse and broad intellectual frameworks to solve problems; iv) Develop judgment and the ability to work in diverse environments; and v) Communicate effectively and persuasively.

The curriculum includes a central core of courses in the functional areas of business, economics, mathematics, communications, and university courses in liberal arts and sciences. Students complete an in-depth study in one functional business concentration and additional business electives. Students also complete a minor from outside the Tepper School of Business to enhance their business education. The minor promotes students' intellectual confidence and leads to the broad knowledge that can last a lifetime. The curriculum structure helps Tepper graduates become leaders in complex global business, technical, and political environments.

Beyond the major in Business Administration, the Tepper School offers minors and additional majors to students in other programs of the university.

B.S. Degree in Business Administration

To receive the B.S. degree in Business Administration, students must complete at least 364 units, consisting of the requirements for the Business Foundations, Business Core, Concentration, Business Electives, University Core, and a Minor.

Business Foundations

	Units
Mathematics	
21-120 Differential and Integral Calculus	10
or 21-111 Differential Calculus & 21-112 and Integral Calculus	
21-256 Multivariate Analysis	9
or 21-259 Calculus in Three Dimensions	
70-257 Optimization for Business	9
or 21-257 Models and Methods for Optimization	
or 21-292 Operations Research I	
Economics	
73-102 Principles of Microeconomics	9
or 73-104 Principles of Microeconomics Accelerated	
73-103 Principles of Macroeconomics	9
73-230 Intermediate Microeconomics	9
or 73-240 Intermediate Macroeconomics	
Statistics	
70-207 Probability and Statistics for Business Applications	9
or 36-200 Reasoning with Data	
70-208 Regression Analysis	9
or 36-202 Methods for Statistics & Data Science	

Business Core

	Units
70-106 Business Science	9
70-110 Business Computing	9
70-122 Introduction to Accounting	9
70-311 Organizational Behavior	9
70-332 Business, Society and Ethics	9
70-340 Business Communications	9
70-345 Business Presentations	9
70-371 Operations Management	9
70-381 Marketing I	9
70-391 Finance	9
70-104 Business Leadership Endeavor I	3
70-204 Business Leadership Endeavor II	3
70-304 Business Leadership Endeavor III	3
70-401 Management Game	12
or 70-447 Client Consulting Project: Strategic Management of the Enterprise	

Concentration

Students must complete one concentration that allows them to gain knowledge and expertise in a particular area of business practice. For students electing to complete an additional major, the concentration requirement is waived (as is the minor requirement) and students must complete three business elective courses as part of the waived concentration requirement. Concentration courses cannot double-count with any other degree requirement including the minor requirement.

- Accounting
- AI and Business
- Business Analytics and Technologies
- Entrepreneurship
- Finance
- Global Economics and Business
- Islamic Business Management
- Marketing Management
- Operations Management
- Product Management
- Strategic Management

Business Electives

Students must complete 18 units of Business Electives. A business elective course is any Business course (70-3xx) that is not being used to satisfy another degree requirement. This can include 21-270 Introduction to Mathematical Finance and upper-level Economics courses (73-3xx and above). Business Electives cannot double-count with any other degree requirement, including the minor.

Minor

In order to obtain the degree, students must complete an academic minor. Students pursuing the business administration primary major are not permitted to complete the following minors: Business Administration, Business Analytics and Optimization, Financial Management, Product Management, and/or Operations and Supply Chain. For students electing to complete an additional major or dual degree, the minor and concentration requirements are waived and the student must complete 9 additional units of business elective coursework.

University Core

Students are required to complete University Core which is the general education program in the Tepper School.

Core @ Carnegie Mellon

All undergraduate students are required to take 99-101 (<http://coursecatalog.web.cmu.edu/search/?P=99-101>) CORE @ Carnegie Mellon to graduate (completed during the first year).

Business Concentrations

The business concentration allows students to gain knowledge and expertise in a particular area of practice. The concentration coursework prepares students with the knowledge and skills for their career pursuits and completing a concentration is part of the business degree requirements. Students should consult with their academic advisor as they consider their business concentration selection.

Business concentrations require at least 36 units beyond the Business Core. Courses taken to meet concentration requirements are not allowed to double count toward any other BA degree requirements, including the minor requirement. Business concentrations may require prerequisites from courses outside the concentration.

Accounting

Required:

70-424 Corporate Financial and Sustainability Reporting

Choose 3 remaining courses from:

70-422 Managerial Accounting

70-427 Modern Banks: Strategy and Regulation

70-428 Financial Statement Analysis

70-498 Business Language Analytics: Mining Financial Texts and Graphs

AI and Business

Required:

70-468 Advanced AI and Business Strategy

70-464 AI & Emerging Economies

Choose 1 course:

70-334 Ethics of Emerging Technologies

70-389 Design Thinking with AI

73-367 AI, Technology, and Work

Chose 1 course:

70-374 Data Mining & Business Analytics

70-458 Advanced Data Management

70-462 Uncertainty and Risk Modeling

70-467 Machine Learning for Business Analytics

Business Analytics and Technologies

Required, choose 1 from:

70-374 Data Mining & Business Analytics

70-467 Machine Learning for Business Analytics

Choose 3 remaining courses from:

70-374 Data Mining & Business Analytics

70-387 Strategy for High-Tech Products and Services

70-455 Data Management Fundamentals

70-458 Advanced Data Management

70-460 Mathematical Models for Consulting

70-467 Machine Learning for Business Analytics

70-469 End to End Business Analytics

70-498 Business Language Analytics: Mining Financial Texts and Graphs

73-366 Designing the Digital Economy

73-374 Econometrics II

Entrepreneurship

Required:

70-415 Introduction to Entrepreneurship

70-416 New Venture Creation

Choose 2 remaining courses from:

70-395 Funding Entrepreneurial Ventures

70-409 Innovation and Entrepreneurship in Emerging Markets

70-438 Commercialization and Innovation

70-443 Digital Marketing and Social Media Strategy

70-496 Venture Capital

49-300 Integrated Product Conceptualization

70-509 Independent Study in Entrepreneurship (special permission required)

Finance

Required:

70-492 Investment Analysis

70-495 Corporate Finance

Choose 2 remaining courses from:

70-337 Business of Blockchain

70-353 Financial Regulation in the Digital Age

70-388 Islamic Finance

70-398 International Finance

70-484 Data Science for Finance

70-493 Valuation and Financial Modeling

70-491 Private Equity

70-496 Venture Capital

70-497 Derivative Securities

70-498 Business Language Analytics: Mining Financial Texts and Graphs

Global Economics and Business

Required:

73-265 Economics and Data Science

Choose 1 course from:

73-347 Game Theory Applications for Economics and Business

73-421 Emerging Markets

Choose 2 remaining courses from:

70-398 International Finance

73-341 Managing through Incentives

73-354 Sports Economics

73-365 Firms, Market Structures, and Strategy

73-366 Designing the Digital Economy

73-427 Sustainability, Energy, and Environmental Economics

Islamic Business Management*

Required:

70-388 Islamic Finance

73-369 Islamic Economics

Choose 2 remaining courses from:

70-342 Managing Across Cultures

70-409 Innovation and Entrepreneurship in Emerging Markets

73-421 Emerging Markets

70-492 Investment Analysis OR 70-495 Corporate Finance (students cannot complete both to fulfill the concentration)

*The Islamic Business Management concentration requires courses only available at CMU-Q.

Marketing Management

Required:

70-481 Marketing Research

Choose 3 remaining courses from:

70-385 Consumer Behavior

70-387 Strategy for High-Tech Products and Services

70-443 Digital Marketing and Social Media Strategy

70-482 Pricing Strategy

70-483 Advertising and Marketing Communications

70-485 Brand Management

Operations Management

Required:

70-460 Mathematical Models for Consulting
70-471 Supply Chain Management

Choose 2 remaining courses from:

70-373 Sustainable Operations
70-422 Managerial Accounting
70-447 Client Consulting Project: Strategic Management of the Enterprise
70-462 Uncertainty and Risk Modeling
70-476 Service Operations Management
70-493 Valuation and Financial Modeling

Product Management

Required:

70-387 Strategy for High-Tech Products and Services
70-452 Introduction to Product Management

Choose 1 course from*:

05-391 Designing Human Centered Software
05-410 User-Centered Research and Evaluation
70-389 Design Thinking with AI

*For business majors with an HCII minor or additional major the requirement is waived and students are required to take 2 courses from 70-385, 70-443, 70-481, 70-482.

Choose 1 course from:

70-385 Consumer Behavior
70-443 Digital Marketing and Social Media Strategy
70-481 Marketing Research
70-482 Pricing Strategy

Strategic Management

Required:

70-437 Strategic Management and Innovation

Choose 3 remaining courses from:

70-387 Strategy for High-Tech Products and Services
70-341 Team Dynamics and Leadership

70-342 Managing Across Cultures

70-385 Consumer Behavior

70-424 Corporate Financial and Sustainability Reporting

Additional Major in Business Administration

Students are eligible to apply for the Additional Major in Business Administration after completion of the Minor in Business Administration requirements plus 21-120 Differential and Integral Calculus and 70-207 Probability and Statistics for Business Applications (or equivalent course).

The following courses are required for the Additional Major:

Business Foundations

Mathematics	Units
21-120 Differential and Integral Calculus	10
or 21-111 Differential Calculus & 21-112 and Integral Calculus	
21-256 Multivariate Analysis	9
or 21-254 Linear Algebra and Vector Calculus for Engineers	
or 21-259 Calculus in Three Dimensions	
or 21-266 Vector Calculus for Computer Scientists	
70-257 Optimization for Business	9
or 21-292 Operations Research I	
Economics	
73-102 Principles of Microeconomics	9
or 73-104 Principles of Microeconomics Accelerated	
73-103 Principles of Macroeconomics	9

73-230 Intermediate Microeconomics	9
or 73-240 Intermediate Macroeconomics	
Statistics	
70-207 Probability and Statistics for Business Applications	9
or 36-200 Reasoning with Data	
70-208 Regression Analysis	9
or 36-202 Methods for Statistics & Data Science	

Business Core

70-110 Business Computing	9
70-122 Introduction to Accounting	9
70-311 Organizational Behavior	9
70-332 Business, Society and Ethics	9
70-340 Business Communications	9
70-345 Business Presentations	9
70-371 Operations Management	9
70-381 Marketing I	9
70-391 Finance	9
70-401 Management Game	12

Business Electives

Students must complete a minimum of 18 units with a maximum of 21 units in upper-level Business courses (70-3xx or higher) that are not being used elsewhere in the additional major requirements. The electives cannot include the Business Leadership Endeavor courses (70-104 Business Leadership Endeavor I, 70-204 Business Leadership Endeavor II, 70-304 Business Leadership Endeavor III) and Independent Study/Internship courses.

Double-Counting Restriction

Students pursuing the additional major may double-count two courses with any other major or minor requirements and are allowed unlimited double-counts for the business foundation courses. There are no double counting restrictions between the additional major and a student's home college general education requirements.

Minors

The Tepper School offers several minor options for students interested in studying business: Business Administration, Business Analytics and Optimization, Financial Management, Operations and Supply Chain Management, and Product Management.

The minor in Innovation and Entrepreneurship is offered by the Tepper School through the Integrated Design, Arts, and Technology (IDeATe) network; students must follow IDeATe policies and procedures for the minor.

Double-Counting:

While there are no double counting restrictions between the minor and the student's home college general education requirements, only one minor course may double-count with any other major or minor requirements. The Minor in Operations and Supply Chain Management allows an additional double-count for a total of 2 courses that may double-count with any other major or minor requirements.

Minor in Business Administration

Required:

70-100 Global Business ¹	9
or 70-101 Business Strategy Fundamentals	
70-122 Introduction to Accounting	9
73-102 Principles of Microeconomics ²	9
or 73-104 Principles of Microeconomics Accelerated	

¹ 70-106 Business Science can substitute for 70-100 or 70-101 only if 70-106 has already been completed by a former primary business major.

² If a student successfully passes the 73-102 waiver, this requirement is waived and the student must take an additional 9 units of either constrained or business electives as defined by the minor.

Constrained Elective (choose one):

70-311	Organizational Behavior	9
70-371	Operations Management	9
70-381	Marketing I	9
70-391	Finance	9

Business Electives: 18 units of coursework at 70-3xx level or above.

The electives **cannot** include: the Business Leadership Endeavor courses (70-104 Business Leadership Endeavor I, 70-204 Business Leadership Endeavor II, 70-304 Business Leadership Endeavor III), 70-207 Probability and Statistics for Business Applications, 70-208 Regression Analysis, and Independent Study/Internship courses.

Note: Students with a primary major in Information Systems using the Business Administration minor to complete the Information Systems concentration have restricted course options by the Information Systems major and should consult with their primary major advisor.

Minor in Business Analytics & Optimization

Students working toward the minor must take a Multivariate Calculus prerequisite course: 21-254 Linear Algebra and Vector Calculus for Engineers, 21-256 Multivariate Analysis, 21-259 Calculus in Three Dimensions, or 21-266 Vector Calculus for Computer Scientists.

Modeling Uncertainty (choose one):

70-207	Probability and Statistics for Business Applications	9
36-200	Reasoning with Data	9
36-220	Engineering Statistics and Quality Control	9
36-225	Introduction to Probability Theory	9

Business Analytics and Optimization Core (required):

70-467	Machine Learning for Business Analytics	9
or 70-374	Data Mining & Business Analytics	
or 15-388	Practical Data Science	
70-257	Optimization for Business	9
or 21-257	Models and Methods for Optimization	
or 21-292	Operations Research I	
70-469	End to End Business Analytics	9

Business Foundations Elective (choose one):

70-122	Introduction to Accounting	9
70-311	Organizational Behavior	9
70-371	Operations Management	9
70-381	Marketing I	9
70-391	Finance	9
73-102	Principles of Microeconomics ¹	9
or 73-104	Principles of Microeconomics Accelerated	

¹ Students may not use the 73-102 prerequisite waiver to satisfy this requirement.

Technical Elective (choose one):

70-208	Regression Analysis	9
70-374	Data Mining & Business Analytics	9
70-455	Data Management Fundamentals	9
70-458	Advanced Data Management	9
70-460	Mathematical Models for Consulting	9
70-462	Uncertainty and Risk Modeling	9
70-467	Machine Learning for Business Analytics	9
73-374	Econometrics II	9
15-388	Practical Data Science	9

Minor in Financial Management

Required:

70-391	Finance	9
70-493	Valuation and Financial Modeling	9
70-207	Probability and Statistics for Business Applications	9
or 36-200	Reasoning with Data	
or 36-220	Engineering Statistics and Quality Control	
or 36-218	Probability Theory for Computer Scientists	
or 36-225	Introduction to Probability Theory	

Elective Courses (choose three):

70-398	International Finance	9
70-428	Financial Statement Analysis	9
70-492	Investment Analysis	9
70-495	Corporate Finance	9
73-103	Principles of Macroeconomics	9
73-337	Business of Blockchain	9
21-270	Introduction to Mathematical Finance	9

Minor in Innovation & Entrepreneurship (IDEATe)

The minor in *Innovation & Entrepreneurship* is offered by the Tepper School of Business (<https://www.cmu.edu/tepper/>) as part of the Integrative Design, Arts, and Technology (<https://ideate.cmu.edu/>) network. *Innovation & Entrepreneurship* is for thinkers, dreamers, problem solvers, and realists. Students quickly learn the myth of the lone creative genius is just that, a myth, and the most transformative ideas and viable businesses come from creativity and repeatable innovation processes, business strategies and models, focused work, and a commitment to tackling real-world problems to bring value to people and the market. Through multidisciplinary coursework and a diverse cadre of faculty experts in business, technology, engineering, and design you will learn how to research, ideate, visualize, and strategize taking an idea or venture forward from multiple perspectives and collaborations. You can expect to expand as a critical thinker while adding hard and soft skills in your toolkit through hands-on learning experiences.

Specifically, you will take courses that emphasize:

- Experiential learning by doing through real-world problems, scenarios, case studies, etc.
- Critical thinking skills to understand problems, analyze strategies, determine approaches
- Multidisciplinary teamwork and collaboration
- Innovation processes, business models, strategies, and approaches
- 2D and 3D prototyping and visualizing of concepts and solutions

The IDEATe undergraduate curriculum consists of ten areas, all of which can also be taken as minors. The themes of these areas integrate knowledge in technology and arts: Game Design, Animation & Special Effects, Media Design, Design for Learning, Sonic Arts, Innovation and Entrepreneurship, Intelligent Environments, Physical Computing, Soft Technologies, and Immersive Technologies in Arts & Culture. *For more information about IDEATe, please see the Undergraduate Options (<http://coursecatalog.web.cmu.edu/aboutcmu/undergraduateoptions/#ideate>) section of the Catalog.*

Innovation & Entrepreneurship Minor Requirements

Prerequisite Course

		Units
73-102	Principles of Microeconomics (prerequisite for 70-438 Commercialization and Innovation)	9

Innovation Entrepreneurial Mindset Course

		Units
70-246	Innovation & Entrepreneurial Mindset	6

One Portal Course

For students without prior design or product design experience, one of the following: Units

15-294	Special Topic: Rapid Prototyping Technologies	5
15-394	Intermediate Rapid Prototyping	5
51-236	Information Design	9
62-478	IDeATe: digiTOOL	9

For students without prior programming or computer science experience: Units

15-104	Introduction to Computing for Creative Practice	10
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One Entrepreneurship Course

70-415	Introduction to Entrepreneurship	9
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One Venture Creation Course

70-395	Funding Entrepreneurial Ventures	9
70-416	New Venture Creation	9

One Innovation Process Course

70-438	Commercialization and Innovation (73-102 Principles of Microeconomics is a prereq)	9
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One Product Development Course

49-300	Integrated Product Conceptualization	12
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Practice/Experience

Multiple possibilities, including:

- 70-416 New Venture Creation (if you did not take it as your Venture Creation option)
- The Swartz Center for Innovation and Entrepreneurship Innovation Scholars Program (<http://www.cmu.edu/swartz-center-for-entrepreneurship/education-and-resources/experiential-learning/innovation-scholars/>)
- The Swartz Center for Innovation and Entrepreneurship Project Olympus Probe (<http://www.cmu.edu/swartz-center-for-entrepreneurship/education-and-resources/project-olympus/probes/student-probe-projects.html>) - Working on your own startup (12 weeks full-time in summer or throughout one full academic year);
- Students may also, with prior approval of Dave Mawhinney, fulfill this requirement through an internship with a qualifying startup or product design firm (12 weeks, full-time). If interested in this option, students should contact Dave Mawhinney (<http://www.cmu.edu/swartz-center-for-entrepreneurship/about/staff.html>) during their internship search.

Double-Counting

No more than two minor courses may double-count toward a student's major core requirements or an additional minor's core requirements.

Minor in Operations & Supply Chain Management**Required:**

73-102	Principles of Microeconomics ¹	9
or 73-104	Principles of Microeconomics Accelerated	
70-371	Operations Management	9
70-257	Optimization for Business	9
or 21-257	Models and Methods for Optimization	
or 21-292	Operations Research I	
70-471	Supply Chain Management	9
70-460	Mathematical Models for Consulting	9
or 70-477	Real Options: Creating Value Beyond NPV	

¹ If a student successfully passes the 73-102 waiver, this requirement is waived and the student must take an additional 9 units of business electives (70-3xx). The electives cannot include the Business Leadership Endeavor courses (70-104 Business Leadership Endeavor I, 70-204 Business Leadership Endeavor II, 70-304 Business Leadership Endeavor III), 70-207 Probability and Statistics for Business Applications, 70-208 Regression Analysis and Independent Study/Internship courses.

Engineering Project Management (choose one):

06-421	Chemical Process Systems Design	12
12-411	Project Management for Engineering and Construction	9
18-540	Rapid Prototyping of Computer Systems	12
18-578	Mechatronic Design	12
19-451 & 19-452	EPP Projects I and EPP Projects II	12
24-370	Mechanical Design: Methods and Applications	12
42-402	BME Design Project	9
88-451 & 88-452	Policy Analysis Senior Project and Policy Analysis Senior Project	12

Minor in Product Management**Required:**

70-381	Marketing I	9
70-387	Strategy for High-Tech Products and Services	9
70-452	Introduction to Product Management	9
73-102 or 73-104	Principles of Microeconomics [*] or Principles of Microeconomics Accelerated	9

* If a student successfully passes the 73-102 waiver, this requirement is waived and the student must take an additional 9 units of minor coursework.

Course in Design Thinking (choose one):

70-389	Design Thinking with AI	9
05-391	Designing Human Centered Software	12
05-410	User-Centered Research and Evaluation	12

Marketing Course (choose one):

70-385	Consumer Behavior	9
70-481	Marketing Research	9
70-482	Pricing Strategy	9
70-483	Advertising and Marketing Communications	9