PRE-GRADUATE BUSINESS ADMINISTRATION

SPS Certificate website: https://sps.northwestern.edu/post-baccalaureate/pregraduate-business-administration/

The Pregraduate Business Administration post-baccalaureate certificate prepares students for the core curriculum of many graduate business schools, including MBA programs. Courses in a range of business-related subjects give students an advantage in the competitive application process and environment of graduate business study.

Certificate Offered

- Pre-Graduate Business Administration, Certificate (https://catalogs.northwestern.edu/sps/certificates/post-baccalaureate/pre-graduate-business-administration/pre-graduate-business-administration-certificate/)

Pre-Graduate Business Administration Courses

ACCOUNT 201-DL Introduction to Financial Accounting (1 Unit)
Introduction to the financial accounting process, including the identification, recording, and communication of accounting information to external users. Generally Accepted Accounting Principles (GAAP) and how their framework fosters the relevance and reliability of financial statements.

ACCOUNT 202-DL Introduction to Managerial Accounting (1 Unit)
A continuation of the introduction to accounting, with emphasis on providing relevant and timely accounting information and analysis to managers for use in planning, decision making, and controlling strategic operational objectives. Topics include the classifications of costs and different ways of reporting and analyzing those costs; the operating budgeting process; capital budgeting; and job-order, standard, process, and activity-based costing systems.
Prerequisite: ACCOUNT 201-DL.

ACCOUNT 208-DL Income Tax I (1 Unit)
Introduction to the field of taxation, with attention to individual income taxation. Gross income, capital gains, deductions, and alternate tax methods. IRS forms used.
Prerequisite: ACCOUNT 202-DL.

ACCOUNT 210-DL Intermediate Accounting I (1 Unit)
Accounting theory and concepts; analysis of special problems that arise in applying these underlying concepts to financial accounting. Accounting information as a basis for decisions by management, stockholders, creditors, and other users of financial and accounting reports.
Prerequisite: ACCOUNT 202-DL.

ACCOUNT 211-DL Intermediate Accounting II (1 Unit)
Accounting problems of corporations' valuation, cost allocation, stockholder equity, and long-term debt; leases, pension plans, and income tax allocations; financial statement construction, effect of errors, cash and other funds, and issues relating to the analysis of financial statements; the present-value concept.
Prerequisite: ACCOUNT 210-DL.

ACCOUNT 308-DL Income Tax II (1 Unit)
A continuation in the field of taxation with particular attention to the field of corporate and business taxation at the Federal level. Corporate formation and capital structure, corporate income tax, other corporate levies, consolidated tax returns, partnerships, and S-corporations.
Prerequisite: ACCOUNT 208-DL.

ACCOUNT 310-DL Managerial Cost Accounting (1 Unit)
Managerial uses of cost data in planning, controlling, and evaluating organizational activities and in making business decisions. Topics include discussion of activity-based costing, standard costs, inventory costing, and review of cost allocation techniques. In addition, contemporary topics, including pricing decisions, balanced scorecard, and capital budgeting techniques will be discussed, along with ethical and behavioral issues addressing both manufacturing and service sectors.
Prerequisite: ACCOUNT 202-DL.

ACCOUNT 340-CN Government and Nonprofit Accounting (1 Unit)
The defining characteristics of accounting for government and nonprofit organizations.

ACCOUNT 350-DL Auditing I (1 Unit)
Foundational concepts of balance sheet audits. Students exercise the role of an external auditor, identifying audit risks, determining appropriate audit techniques and evidencing, and executing audits of primary financial areas present at most companies.

ACCOUNT 360-DL Auditing II (1 Unit)
Builds on foundational audit concepts and applies them to real-life situations, including the understanding and analysis of company financial statements. Internal control frameworks and standards, alternatives to the traditional financial statement audit, roles of the external and internal auditor are also considered.
Prerequisite: ACCOUNT 350-DL.

ACCOUNT 370-CN Advanced Accounting (1 Unit)
Accounting for multi-corporate entities and acquisitions, consolidated financial statements, accounting for state and local governments, partnerships, accounting for non-profit organizations, and foreign operations.
Prerequisite: ACCOUNT 211-DL.

ACCOUNT 390-CN Topics in Accounting: (1 Unit)
Topics vary. May be repeated for credit with different topic.

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Topics vary. May be repeated for credit with different topic.

ACCOUNT 399-CN Independent Study (1 Unit)

FINANCE 202-CN Introduction to Finance (1 Unit)
Introduction to the basic concepts and models used in finance.
Prerequisite: MATH 101-CN, STAT 202-CN, or college algebra, statistics, financial accounting, microeconomics, and macroeconomics, or equivalents. Carries business credit.

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FINANCE 360-CN Corporate Finance (1 Unit)
Topics include capital budgeting; how companies determine what an appropriate discount rate would be for a given capital investment; the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT) models used to estimate a firm's cost of equity; detailed consideration of how beta is estimated for the CAPM; how a company derives its weighted average cost of capital (WACC); the dividend policy decision and capital structure theory; financial planning models; the adjustments typically made to financial statement data to accommodate

the needs and viewpoints of financial analysts and investors; corporate risk management (hedging techniques).
Prerequisite: FINANCE 202-CN or equivalent.

FINANCE 363-CN Financial Markets and Institutions (1 Unit)
The role of financial institutions and markets from a financial manager's perspective. Process of financial intermediation within the economy.
Prerequisite: FINANCE 202-CN.

FINANCE 364-CN Investment Theory (1 Unit)
Theory underlying the construction of a financial assets portfolio with the objective of maximizing expected return for a specified tolerable level of risk. Topics include risk aversion and utility functions; diversification; capital allocation to risky assets (the separation property); optimal risky portfolios; index models; the Capital Asset Pricing Model and multifactor models of risk and return; and the efficient market hypothesis.
Prerequisite: FINANCE 202-CN or equivalent.

FINANCE 365-CN Portfolio Management (1 Unit)
Applied investment management.
Prerequisite: FINANCE 202-CN or equivalent.

FINANCE 368-CN Options and Futures (1 Unit)
Development of skills to value and use options, futures, and related financial contracts. Topics include arbitrage, hedging, spreading, pricing relations, models such as Black Scholes and cost of carry, and currency and interest-rate swaps.
Prerequisite: FINANCE 202-CN or equivalent.

FINANCE 390-CN Special Topics: (1 Unit)
Topics vary. May be repeated for credit with different topic.

FINANCE 399-CN Indp Study (1 Unit)

MATH 100-CN Quantitative Reasoning (1 Unit)
NPEP course.

MATH 101-CN Algebra (1 Unit)
Overview of core mathematical concepts that permeate business, science and everyday life. Primary focus is on mathematical tools needed in a variety of degree programs. Topics include: functions and graphs, linear, polynomial and rational equations, inequalities and their applications, modeling, variation, and systems of equations. This course does not count for credit if taken after any higher mathematics course. May not be audited.

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Overview of core mathematical concepts that permeate business, science and everyday life. Primary focus is on mathematical tools needed in a variety of degree programs. Topics include: functions and graphs, linear, polynomial and rational equations, inequalities and their applications, modeling, variation, and systems of equations. This course does not count for credit if taken after any higher mathematics course. May not be audited.

MATH 110-CN Introduction to Mathematics (1 Unit)
NPEP course.

MATH 113-CN Precalculus Mathematics (1 Unit)
Properties and graphs of the basic functions: polynomial, rational, exponential, logarithmic, and trigonometric. Complex numbers, theory of equations, and selected topics are also included. May not be audited.

MATH 202-CN Finite Mathematics (1 Unit)
Foundation of mathematical knowledge targeting data analysis. Topics chosen from set theory, combinatorics (the art of counting), finite probability, elementary linear algebra and its applications to linear optimization problems.

MATH 211-CN Short Course in Calculus (1 Unit)
Elements of differential and integral calculus.

MATH 220-A Single-Variable Differential Calculus (1 Unit)
Limits. Differentiation. Linear approximation and related rates. Extreme value theorem, mean value theorem, and curve-sketching. Optimization.

MATH 220-B Single-Variable Integral Calculus (1 Unit)
Definite integrals, antiderivatives, and the fundamental theorem of calculus. Transcendental and inverse functions. Areas and volumes. Techniques of integration, numerical integration, and improper integrals. First-order linear and separable ordinary differential equations.
Prerequisite: MATH 220-A.

MATH 226-CN Sequences and Series (1 Unit)
Sequences, series, and convergence tests. Power series, Taylor polynomials and error. Complex numbers. Second-order linear ordinary differential equations and power series solutions.
Prerequisite: MATH 220-B.

MATH 230-A Multivariable Differential Calculus (1 Unit)
Vectors, vector functions, partial derivatives, and optimization.
Prerequisite: MATH 220-B.

MATH 230-B Multivariable Integral Calculus (1 Unit)
Multiple integration: double integrals, triple integrals, and the change of variables theorem. Vector calculus: vector fields, line integrals, surface integrals, curl and divergence, Green's theorem, Stokes' theorem, and the divergence theorem.
Prerequisite: MATH 230-A.

MATH 240-CN Linear Algebra (1 Unit)
Elementary linear algebra: systems of linear equations, matrix algebra, subspaces, determinants, eigenvalues, eigenvectors, and orthogonality.
Prerequisite: MATH 230-A or equivalent.

MATH 250-CN Elementary Differential Equations (1 Unit)
Elementary ordinary differential equations: first-order equations, second-order linear equations, series solutions, and systems of first-order linear equations.
Prerequisite: MATH 230-A, MATH 240-CN, or equivalents.

MATH 300-CN Foundations of Higher Mathematics (1 Unit)
Introduction to fundamental mathematical structures, including sets, functions, equivalence relations, and cardinal numbers. Elementary logic and proof techniques.
Prerequisite: MATH 240-CN.

MATH 306-CN Combinatorics & Discrete Mathematics (1 Unit)
Discrete mathematics, inductive reasoning, counting problems, binomial coefficients and Pascal's triangle, Fibonacci numbers, combinatorial probability, divisibility and primes, partitions, and generating functions.
Prerequisite: MATH 240-CN.

MATH 310-A Probability and Stochastic Processes (1 Unit)
Axioms of probability. Conditional probability and independence. Random variables. Joint distributions. Expectation. Limit theorems: the weak law of large numbers and the central limit theorem.
Prerequisite: MATH 230-B.

MATH 310-B Probability and Stochastic Processes (1 Unit)
Discrete-time Markov chains, recurrence and transience.
Prerequisite: MATH 240-CN and MATH 310-A.

MATH 310-C Probability and Stochastic Processes (1 Unit)
Continuous-time Markov chains, queues, population growth models. Brownian motion and other diffusion processes.
Prerequisite: MATH 310-B.

MATH 320-A Introduction to Real Analysis (1 Unit)

Analysis on the real line: axiomatic development of the real number system, sequences and series of real numbers, continuity, and differentiability.
Prerequisite: MATH 300-CN.

MATH 320-B Real Analysis II (1 Unit)
Analysis on the real line: the Riemann integral and sequences and series of functions.
Prerequisite: MATH 320-A.

MATH 320-C Introduction to Real Analysis (1 Unit)
Analysis on Euclidean spaces: the topology of Euclidean spaces, limits, continuity, and differentiability, including the inverse and implicit function theorems.
Prerequisite: MATH 320-B.

MATH 325-CN Complex Analysis (1 Unit)
Complex numbers. Analytic functions. Cauchy's theorem and the Cauchy integral formula. Series. Residues.
Prerequisite: MATH 230-B.

MATH 330-A Abstract Algebra (1 Unit)
Group theory.
Prerequisite: MATH 300-CN.

MATH 334-CN Linear Algebra II: Second Course (1 Unit)
Vector spaces. Linear maps. Eigenvalues, eigenvectors and invariant subspaces. Inner product spaces. Canonical forms of operators on real and complex vector spaces.
Prerequisite: MATH 300-CN.

MATH 336-A Introduction to the Theory of Numbers (1 Unit)
Divisibility and prime numbers. Congruences. Quadratic reciprocity. Diophantine equations.
Prerequisite: MATH 230-A.

MATH 340-CN Geometry (1 Unit)
Axioms for Euclidean geometry. Non-Euclidean geometry. Projective geometry. Introduction of coordinate systems from the axioms. Quadrics. Erlangen program. Introduction to plane algebraic curves.
Prerequisite: MATH 300-CN.

MATH 366-A Mathematical Models in Finance (1 Unit)
Cash flow computations. Basic financial concepts (stocks, bonds, options, arbitrage, hedging) and put-call parity. Binomial tree models. Risk-neutral valuation. Random walk and Brownian motion as a tool of modeling fluctuations. Options pricing. Applications of the central limit theorem. The Black-Scholes formula and partial differential equation. Numerical approximations. Some familiarity with differential equations is desirable.
Prerequisite: MATH 240-CN.

MATH 399-CN Independent Study (1 Unit)