Course Description

This course reviews principles of corporate finance and managerial accounting with a focus on the work of analytics managers. Analytics managers are often responsible for the Profit-and-Loss (P&L) of their projects and divisions which have certain unique needs in terms of workflow, co-working with other businesses, cooperating with multiple stakeholders (especially IT), and employing highly specialized knowledge professionals. To support these responsibilities, students learn how to conduct break even (cost-volume-profit) analysis, apply discounted cash flow analysis and compute return on investments. Students also learn how to build and read balance sheets, income statements, and cash flow statements and infer risks related to companies. The course provides in-depth coverage of spreadsheet programming methods, setting the stage for subsequent financial modeling work.

Course Objectives

By the end of this course, you will be able to:

- Define the basic building blocks of financial accounting, managerial accounting, and corporate finance and recall the associated terminology.
- Conduct cost-volume-profit analysis using discounted cash flows and predict future cash flows to compute current and potential returns on investment.
- Read and summarize key features of a Balance Sheet, Income Statement, and Cash-Flow Statement of an organization.
- Calculate and interpret the ratios necessary to understand the financial health of an organization or a project.
- Construct a financial plan for an analytics project or business using the metrics learnt in the course and develop a pricing strategy for the project or business.

Prerequisites

MSDS 402-DL Introduction to Data Science

Required and Optional Readings and Resources

Required Readings

*Electronic versions of the text are perfectly acceptable.

- Brealey, R. A., Myers, S. C., and Allen, F. 2016. *Principles of Corporate Finance* (Twelfth Edition). New York: McGraw-Hill. [ISBN-13: 978-1259144387]
- Dauderis, H and Annand, D. 2014. *Introduction to Financial Accounting* (Version 2017 – Revision C). Lyryx Advanced Learning. (Can be freely accessed under a Creative Commons License.)
- Heisinger, K and Hoyle, J. *Managerial Accounting*. [ISBN-13: 978-1-4533452-9-0] Saylor Foundation. (Can be freely accessed under a Creative Commons License.)

- Assigned readings posted on Canvas, including timely news articles and academic research that you will read in order to complete some assignments and participate in discussion forums.

Course Reserves

Some readings will be available through the Course Reserves in the left navigation menu. Assignment and Discussion forum instructions will note which readings are to be accessed through Course Reserves. For assistance with Course Reserves, e-mail e-reserve@northwestern.edu. To ask a librarian for assistance, visit Northwestern's Ask A Librarian page.

Assignment Overview and Grading Breakdown

Grading and feedback turnaround will be one week from the due date. You will be notified if turnaround will be longer than one week. The Midterm Exam and Final Exam and Presentation will be graded and returned within two weeks.
The discussion forums, written assignments, and midterm and final presentation will be graded based on specific criteria or a rubric. The criteria or rubric for each type of assessment will be available in the course. To view the discussion forum rubric, click the gear icon in the upper right corner of the page and choose Show Rubric. The Written Assignment Rubric and Presentation Rubric will automatically appear on the page.

Item	Details	Grade
Discussion Boards	There will be 2 graded weekly discussion forum questions. I have come to believe that the discussion forum is an important tool after seeing its efficacy in online teaching in the last few years – so I will expect you all to please participate. And participation would be with seriously well thought out arguments and discussions, where you will enhance the quality of discussion with your commentary.	10%
Quizzes	There will be 5 graded quizzes. These may or may not be multiple choice questions and the objective will be to test your understanding of the material covered in the previous week. Quizzes are for 5 or 10 points and will usually have 5 short questions	35%
Assignments	There will be 2 long assignments with a total of 30 points. These will usually seem like a mix between a quiz and a discussion – and will have both structured questions along with questions where I would expect to hear your analysis of a subject.	30%
Final Presentations	Students will use the tools discussed over the entire course to build a detailed presentation on a hypothetical analytics company or an analytics division in a firm which they plan to start. Students will work with any idea – original or not – using which they will start a hypothetical company. The Final Presentation will effectively be a financial business plan for their start up or new data science division and cover all areas of the course.	25%

Grading Scale

Grade	Percentage/Points
A	93%–100% (465–500 points)
A-	90%–92% (450–464 points)
B+	87%–89% (435–449 points)
B	83%–86% (415–434 points)
B-	80%–82% (400–414 points)
C+	77%–79% (385–399 points)
C	73%–76% (365–384 points)
C-	70%–72% (350–364 points)
F	0%–69% (0–349 points)

Late Work Policy

Late work will be accepted only in the event of an instructor-approved absence. Contact your instructor as soon as possible, at least 24 hours in advance.

Online Communication and Interaction Expectations

Discussion Forums

The purpose of the discussion boards is to allow students to freely exchange ideas. It is imperative to remain respectful of all viewpoints and positions and, when necessary, agree to respectfully disagree. While active and frequent participation is encouraged, cluttering a discussion board with inappropriate, irrelevant, or insignificant material will not earn additional points and may result in receiving less than full credit. Frequency matters, but contributing content that adds value is paramount. Please remember to cite all sources—when relevant—in order to avoid plagiarism. Please post your viewpoints first and then discuss others' viewpoints. The quality of your posts and how others view and respond to them are the most valued. A single statement mostly implying "I agree" or "I do not agree" is not counted as a post. Explain, clarify, politely ask for details, provide details, persuade, and enrich communications for a great discussion experience. Please note, there is a requirement to respond to at least two fellow class members posts. Also, remember to cite all sources—when relevant—in order to avoid plagiarism – which is a very serious offence.

Participation and Attendance

This course will not meet at a particular time each week. All course goals, session learning objectives, and assessments are supported through classroom elements that can be accessed at any time. To measure class participation (or attendance), your participation in threaded discussion boards is required, graded, and paramount to your success in this course. Please note that any scheduled synchronous meetings are optional. While your attendance is highly encouraged, it is not required and you will not be graded on your attendance or participation.

Student Support Services

AccessibleNU

This course is designed to be welcoming to, accessible to, and usable by everyone, including students who are English-language learners, have a variety of learning styles, have disabilities, or are new to online learning. Be sure to let me know immediately if you encounter a required element or resource in the course that is not accessible to you. Also, let me know of changes I can make to the course so that it is more welcoming to, accessible to, or usable by students who take this course in the future.
Northwestern University and AccessibleNU are committed to providing a supportive and challenging environment for all undergraduate, graduate, professional school, and professional studies students with disabilities who attend the University. Additionally, the University and AccessibleNU work to provide students with disabilities and other conditions requiring accommodation a learning and community environment that affords them full participation, equal access, and reasonable accommodation. The majority of accommodations, services, and auxiliary aids provided to eligible students are coordinated by AccessibleNU, which is part of the Dean of Students Office.

SPS Student Services

The Department of Student Services supports the academic and professional growth of SPS students. The Student Services team guides students through academic planning, policies, and administrative procedures, and promotes a supportive environment to foster student success. Students are encouraged to actively make use of the resources and staff available to assist them: Academic and Career Advisers, Counseling and Health Services, Student Affairs, Legal Services, Financial Aid and Student Accounts, among other services.
For a comprehensive overview of course and program processes and policies and helpful student resources, please refer to your SPS Student Handbook.

Academic Support Services

Northwestern University Library

As one of the leading private research libraries in the United States, Northwestern University Library serves the educational and information needs of its students and faculty as well as

scholars around the world. Visit the Library About page for more information or contact Distance Learning Librarian Tracy Coyne at 312-503-6617 or tracy-coyne@northwestern.edu.

Program-Specific Library Guides

- Data Science

Additional Library Resources

- Connectivity: Campus Wireless and Off-Campus Access to Electronic Resources
- Reserve a Library Study Room
- Sign up for an in-person or online Research Consultation Appointment
- Getting Available Items: Delivery to Long-Distance Patrons
- Social Science Data Resources
- Resources for Data Analysis

The Writing Place

The Writing Place is Northwestern's center for peer writing consultations. Consultations are free and available to anyone in the Northwestern community: undergraduates, graduate students, faculty, or staff. To book an appointment, go to The Writing Place website.

The Math Place

The Math Place is a free tutorial service provided to students currently enrolled in Northwestern University's School of Professional Studies courses or in other Northwestern University courses. Students of all levels can benefit from the individual tutoring provided from this service, whether they are taking undergraduate or graduate level courses. To book an appointment, go to The Math Place website.

Academic Integrity at Northwestern

Students are required to comply with University regulations regarding academic integrity. If you are in doubt about what constitutes academic dishonesty, speak with your instructor or graduate coordinator before the assignment is due and/or examine the University Web site. Academic dishonesty includes, but is not limited to, cheating on an exam, obtaining an unfair advantage, and plagiarism (e.g., using material from readings without citing or copying another student's paper). Failure to maintain academic integrity will result in a grade sanction, possibly as severe as failing and being required to retake the course, and could lead to a suspension or expulsion from the program. Further penalties may apply. For more information, visit The Office of the Provost's Academic Integrity page.
Some assignments in SPS courses may be required to be submitted through Turnitin, a plagiarism detection and education tool. You can find an explanation of the tool here.

Course Technology

This course will involve a number of different types of interactions. These interactions will take place primarily through the Canvas system. Please take the time to navigate through the course

and become familiar with the course syllabus, structure, and content and review the list of resources below.

Canvas

The Canvas Student Center includes information on communicating in Canvas, navigating a Canvas course, grades, additional help, and more. The Canvas at Northwestern website provides information of getting to know Canvas at Northwestern and getting Canvas support.
The Canvas Student Guide provides tutorials on all the features of Canvas. For additional Canvas help and support, you can always click the Help icon in the lower left corner to begin a live chat with Canvas support or contact the Canvas Support Hotline.
The Canvas Accessibility Statement and Canvas Privacy Policy are also available.

BlueJeans

We will use BlueJeans for optional synchronous meetings. The Northwestern IT YouTube channel on Blue Jeans Video conferencing and the Canvas Learning Center BlueJeans page provide additional guidance for using BlueJeans.
The Blue Jeans Privacy Policy and the Accessibility Features on BlueJeans are also available.
Please note that any scheduled synchronous meetings are optional. While your attendance is highly encouraged, it is not required and you will not be graded on your attendance or participation. These synchronous sessions will be recorded, so you will be able to review the session afterwards.

Panopto

Videos in this course may be hosted in Panopto. If you have not used Panopto in the past, you may be prompted to login to Panopto for the first time and authorize Panopto to access your Canvas account. You can learn more about using Panopto and login to Panopto directly by visiting the Panopto guide on the Northwestern IT Resource Hub. Depending on the assignment requirements of this course, you may be asked to create videos using Panopto in addition to viewing content that your instructor has provided through Panopto.
The Panopto Privacy Policy and the Accessibility Features on Panopto are also available.

Minimum Required Technical Skills

Students in an online program should be able to do the following:

- Communicate via email and Canvas discussion forums.
- Use web browsers and navigate the World Wide Web.
- Use the learning management system Canvas.
- Use integrated Canvas tools (e.g., BlueJeans, YellowDig, ARC, Panopto, Course Reserves).
- Use applications to create documents and presentations (e.g., Microsoft Word, PowerPoint).
- Use spreadsheet software (e.g. MS Excel)
- Use applications to share files (e.g., Box, Google Drive).
- Use software for statistical analysis (e.g., SPSS).

- Use software for predictive analytics (e.g., R, Tableau).

Systems Requirements for Distance Learning

Students and faculty enrolled in SPS online master's degree programs should have access to a computer with the Minimum System Requirements.

Technical Help and Support

The SPS Help Desk is available for Faculty, Students and Staff to support their daily IT needs. For additional technical support, contact the Northwestern IT Support Center.

Course Schedule

Module 1

Learning Objectives

- Outline the differences between different types of corporate ownerships and structures.
- Recall the different types of capital raising formats.
- Distinguish between the different forms of capital (like debt, equity, venture capital etc.) and discuss their unique characteristics

Readings & Media

Required Readings

- Principles of Corporate Finance (PCF) Chapter 1: Introduction to Corporate Finance.
- PCF Chapter 14: An Overview of Corporate Finance.

Assignments

Discussion on capital raising in the analytics industry.

Module 2

Learning Objectives

- Describe the Balance Sheet equation.
- Demonstrate the use of double entry system of accounts.
- Employ journal and the general ledger (T-Accounts) for basic accounting entries.

Readings & Media

Required Readings

- Introduction to Financial Accounting (IFA) Chapter 2: The Accounting Process.

Assignments

Short Quiz on creating Journal Entries and Ledger Entries from transactions.

Module 3

Learning Objectives

- Create a basic Trial Balance for a company.
- Explain the concept of Accrual Accounting.
- Demonstrate the needs for Adjustments to Trial Balance.
- Create a basic Balance Sheet and Income Statement for a company.

Readings & Media

Required Readings

- Chapter 3: Financial Accounting and Adjusting Entries.

Assignments

Creating a Simple Balance Sheet and Income Statement for a small data science firm.

Module 4

Learning Objectives

- Apply the concept of Time Value of Money to financial problems.
- Calculate Present Value and Net Present Value of future cash flows.

Readings & Media

Required Readings

- PCF Chapter 2: How to Calculate Present Value.

Assignments

Short Quiz on calculating NPV and other return measures of an analytics project.

Module 5

Learning Objectives

- Calculate the Internal Rate of Return of a project.
- Calculate Holding Period Returns and Payback Period Returns to evaluate multiple returns calculations.
- Compare across project on the basis of IRR, HPR, PPR, and NPV to take investment decisions.

Readings & Media

Required Readings

- PCF Chapter 5: Net Present Value and Other Investment Criteria.
- PCF Chapter 6.3.

Assignments

Discuss forum on the use and abuse of different investment criteria.

Module 6

Learning Objectives

- Relate interest rates and inflation, and how that correlates to foreign exchange.
- Judge what optimal discount rates should be for any local or international project.
- Calculate the values of an annuity and other interest-bearing fixed income instruments.

Readings & Media

Required Readings

- PCF Chapter 3
- PCF Chapter 27

Assignments

Assignment on the economics of analytics outsourcing.

Module 7

Learning Objectives

- Employ the methods of managerial accounting to record, analyze, and allocate costs for any project.
- Prepare break-even analysis for projects.
- Generate budgets for analytics projects using costing and valuation.

Readings & Media

Required Readings

- Managerial Accounting (MA) Chapter 1.1, 1.6, 2.1 and 2.4.
- MA Chapter 5.2 & 5.3: Cost Estimation and Contribution Margin Income Statement.
- MA Chapter 6.1 - 6.3 : How Is Cost-Volume-Profit Analysis Used for Decision Making?

Optional Readings

- MA Chapter 9: How are Operating Budgets Created.

Assignments

Ungraded: Idea for the Final Presentation – a one-page document with a planned outline.

Module 8

Learning Objectives

- Sketch the key steps of a financial plan.
- Interpret key financial planning metrics to prepare a plan for short-term financing.

- Interpret working capital metrics and employ these metrics to gauge budgeting needs.

Readings & Media

Required Readings

- PCF Chapter 29: Financial Planning.
- PCF Chapter 30.2 and Chapter 30.3: Working Capital Management.

Assignments

Short quiz on calculating financial planning metrics.

Module 9

Learning Objectives

- Discuss the efficient market hypothesis and portfolio theory.
- Apply the capital asset pricing model for markets.
- Calculate risk adjusted returns measures like the Sharpe Ratio.
- Calculate the Weighted Average Cost of Capital (WACC).
- Create a capital budgeting plan for a corporation.

Readings & Media

Required Readings

- PCF Chapter 7: Introduction to Risk and Return.
- PCF Chapter 8.1 and 8.2: Portfolio Theory and Capital Asset Pricing Model.
- PCF Chapter 9.1 and 9.2: Risk and Cost of Capital.

Assignments

Short quiz on calculating risk metrics for technology firms.

Module 10

Learning Objectives

- Evaluate the financial health, profitability, liquidity, solvency and leverage of a corporation using financial ratios.
- Evaluate the potential Return on Equity and Return on Assets of a company using the Du Pont Model.

Readings & Media

Required Readings

- PCF Chapter 28: Financial Analysis.

Optional Readings

- PCF Chapter 11: Investment, Strategy and Economic Rents.

Assignments

- Short quiz on financial ratios of a large technology firm.
- Final Project Submission after One Week.