Graduate Student Manual

Master of Science in Finance

I | **Gies College of Business**

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Welcome MSF Class of 2022 & congratulations on your admission to the MSF Program!

In the MSF Academic Handbook you will find useful information about your studies. Please refer to this handbook for academic related issues. The handbook includes:

- A description of the MSF curriculum and program requirements
- A discussion of areas of specialization in finance
- A list of MSF specializations requirements and corresponding electives
- Course descriptions and tentative schedule
- Provisional study plans by specialization track.

If you would like to discuss any academic issue with me, please sign up for an appointment at **my.business.illinois.edu/advising**.

I again would like to extend a warm welcome to all of you and wish you a very productive year!

Best regards,

Martin Widdicks

Director, MSF Program
Teaching Associate Professor in Finance
James F. Towey Faculty Fellow

STEM program

Dear Class of 2022,

Since 2017, the MSF degree has been classified as a STEM (Science, Technology, Engineering, Mathematics) program.

This classification reflects the increasing technical focus of our program with well- established Courses in Financial Engineering, Financial Modeling, Risk Management, and Statistics as well as our new offerings in Market Microstructure, Big Data Analysis, Interest Rate Modeling, and Practical Asset Allocation.

The STEM classification allows international students to extend their stay in the US by working in their field of study. In particular MSF graduates on F-1 visas will be able to remain in the US for up to 36 months via the optional practical training (OPT) **STEM extension** instead of 12 months.

Regards,

Martin Widdicks

Incoming International MSF Students, Class of 2022

Finding permanent employment in the United States has, in recent years, become more challenging for students requiring H1B visa sponsorship. The primary factors that negatively impact an international graduate's chances of securing a position in the US include the current economic conditions and present US government regulations on the number H-1B visas available, and the high number of international applicants seeking positions. The following announcement was made by USCIS on **April 5, 2021** regarding the H-1B applications received last year:

"USCIS Completes the H-1B Cap Random Selection Process for FY 2020 and Reaches the Advanced Degree Exemption Cap

On March 30, USCIS used a computer-generated random selection process to select enough H-1B petitions to meet the congressionally-mandated regular cap and the U.S. advanced degree exemption for fiscal year (FY) 2020. After completing the random selection process for the regular cap, USCIS also determined that it has received a number of petitions projected as sufficient to meet the 20,000 H-1B visa U.S. advanced degree exemption, also known as the master's cap.

*USCIS received nearly 275,000 H-1B petitions during the filing period, which began April 1, including petitions filed for the advanced degree exemption. **USCIS announced on April 5** that it had received enough petitions to reach the congressionally mandated H-1B regular cap of 65,000.*

*In accordance with the **new H-1B regulation**, USCIS first conducted the selection process for H-1B cap-subject petitions submitted on behalf of all beneficiaries, including those that may have been eligible for the advanced degree exemption. USCIS then selected a number projected to reach the advanced degree exemption from the remaining eligible petitions. USCIS will reject and return all unselected petitions with their filing fees unless the petition is a prohibited **multiple filing (PDF, 119 KB)**."*

Those international graduate students who, in recent years, have been successful in finding employment in the United States, have most often possessed the following attributes:

- Exceptional English/communication skills.
- An undergraduate degree in a business discipline.
- Relevant work experience for the job applied for (usually at least two-years of full-time experience).
- A clear understanding of where their skills/experiences and their graduate degree positions them within the organization.
- Are proactive

Business Career Services and the MSF program can act as a resource in supporting all students' efforts in identifying job search sources, connecting with alumni whenever possible, and developing a strategy for identifying US companies that have offices in the countries in which the student is authorized to work. We will provide the resources necessary to aid in the job search, including resume preparation and interview skills; however, based on the highly competitive market for all international students, students should tailor their expectations and job search strategy accordingly.

As we prepare for the coming year, we recognize our role in developing Finance leaders in a global economy. We expect our graduates to seek opportunities around the world in both private industry and the public sector. MSF Graduates must have a global perspective as they begin their careers in business and finance. This means looking for opportunities in the US and other markets plus taking advantage of your undergraduate and graduate education in your career search.

We are looking forward to working with all of you, domestic and international students, as you begin your preparation in carrying on the tradition as graduates of the MSF program.

MS Finance Curriculum for Fall 2021 start

Introduction to program and courses (July 27-28)

You will receive detailed descriptions of core courses, electives, and specializations. Advice will be given on typical study plans and you will have a chance to ask questions of the Program Director and Professors involved in the program.

Registration opens August 1

Fall Introductions (August 16-20)

A chance for you to meet and interact with your new classmates, the MSF team, key professors in the program, Business Career Services, Illinois Business Consulting and students in other graduate business programs.

Fall Semester 2021 (August 23 to December 17)

Core Courses:

Note: These Courses may be waived by students with suitable training at the undergraduate level without permission of the MSF Academic Director. For example, students with a Finance undergraduate degree do not need to take FIN 580 CF, students with mathematical backgrounds do not need to take FIN 502 etc.

FIN 580 XCF, Corporate Finance	**4 hours**	Smith
FIN 580 P1, Data Science & Python for Finance	**2 hours**	Gao
FIN 504, Accounting for Financial Analysis	**2 hours**	Ibrahim
FIN 502, Quantitative Finance	**2 hours**	Yang

Core Courses:

* Denotes required for graduation

*FIN 501 Economics of Stock Market Fundamentals	**4 hours**	Miller
*FIN 511 Investments	**4 hour**s	Pollet
*FIN 581 Professional Development	**2 hours**	Smith
Electives (e.g. FIN elective or ACCY 501)	**Up to 6 hours**	Various

Spring Semester 2022

(January 18 to May 13)

Electives (e.g. FIN elective or ACCY 517)	**Up to 14 hrs**	Various

Fall Semester 2022

(August 22 to December 16)

Electives (e.g. FIN elective or others)	**Up to 16 hrs**	Various

In Fall 2022, many of you will want to participate in FIN 583 Practicum but it is not a required class. However, we will find enough projects for any student who wants to take part in the Practicum.

MS Finance Program Requirements

Effective Registration 2021
Summary by Type of Course

1. Core courses	0 – 10 hours
2. Required courses	10 hours
3. Finance Electives	8+ hours
4. Other Electives (may also be in Finance)	12+ hours
5. ESL Courses (if required)	0 hours
Total	**40+ hours**

1. Core Courses:

Core courses are designed for students to build their fundamental skills in key areas of Finance.
There are three core courses that run in Fall 2021:

FIN 580 XCF, Corporate Finance	**4 hours**	Smith
FIN 580 P1, Data Science & Python for Finance	**2 hours**	Gao
FIN 504, Accounting for Financial Analysis	**2 hours**	Ibrahim
FIN 502, Quantitative Finance	**2 hours**	Yang

Students with an appropriate undergraduate background may waive some or all of these Courses without permission of the MSF Academic Director. In particular,

• Students with a Finance major or minor at the undergraduate degree do not need to take FIN 580 CF

• Students who have taken an intermediate class in Business Statistics do not need to take FIN 502

• Students who have taken Courses in financial accounting do not need to take FIN 504

2. Required Courses

There are three required courses

FIN 511, Investments	**4 hours**	Pollet
FIN 501, Economics of Stock Market Fundamentals	**4 hours**	Miller
FIN 581, Professional Development	**2 hours**	Smith

Typically, these courses cannot be waived. On a case-by-case basis, the MSF Academic Director may allow more advanced courses as substitutes for these required courses, but such a substitution is very rare.

3. Finance Electives

In order to graduate, students must earn at least 28 credit hours of Finance Courses including core and required courses. The remaining credits are taken up by Finance Electives. These are listed in detail for the Fall semester on page 9. Full descriptions of all electives are listed beginning on page 21. Do note that the list of elective offerings is subject to change depending on the availability of professors. Note that many students will take more than 28 hours of Finance Courses

The list of elective includes the MSF Practicum in Fall 2021 (FIN 583). The MSF Practicum is your opportunity to work as a member of a student team on a semester long finance consulting project at a sponsoring corporation during your final semester. The practicum is a win-win program, as you gain valuable experience and have an opportunity to significantly impact a company. Corporate partners see the practicum project as an opportunity to use talented, external manpower to tackle a project that requires specialized insight or tools. An information session will be held in the spring. The practicum is not required for graduation, but a large majority of students will choose to take part.

4. Other Electives

Any 2 or 4-hour course offered by the Gies College of Business (excluding Courses on our online degrees—iMBA, iMSA etc.) or the Department of Economics is generally acceptable, for example common choices are:

- Business Administration courses such as BADM 520, Marketing Management and BADM 508, Leadership and Teams.
- Accountancy courses such as ACCY 517 Financial Statement Analysis, ACCY 501, Accounting Analysis I, ACCY 502 Accounting Analysis II
- Economics courses such as ECON 516, Monetary Theory and ECON 514, International Financial and other advanced Economics courses may also be choices for selective students.

Additionally, courses in Computer Science, Industrial Engineering, Mathematics, and Statistics may be appropriate for students on the Quantitative Finance or Data Analytics and Fintech specialization, for example STAT542 Statistical Learning, IE 410 Stochastic Processes, CS 450 Numerical Analysis etc.

On a case-by-case basis, the MSF Academic Director will consider the possibility of 4 credit hour courses offered by other Colleges if an acceptable rationale is provided. Note that:

- Only 400 or 500 level courses will count toward the hours required for the degree.
- Courses on our online degrees – iMBA, iMSA etc. will not be considered.
- Students are not allowed to take a 400-level course if a similar 500-level course is offered.
- It may be possible to take a 100, 200 or 300 level course, but the credits may not be counted for credit toward any master's degree, however the grade is still included in any GPA calculation.

5. English as a Second Language (ESL) Courses

If you are required to take the ESL Placement Test (EPT), the results of that test determine whether you have to take any ESL courses. Most often, if you are required to take only one course, it will be ESL 522, Introduction to Business Writing. If you are required to take two courses, they will be ESL 522 and ESL 521, Oral and Written Business Communication. Note that you were informed if you needed to take the EPT in your official notification of admission from the Graduate College.

Other Important Requirements/Considerations:

- Grade point average (GPA) – it is necessary to attain and maintain an overall GPA of at least 3.00 on all graduate courses (500 and 400 level) taken while in the MSF program in order to receive the M.S. Finance degree. If your cumulative GPA is below a 3.00 in a given semester then you will be placed on academic probation. Students on academic probation whose cumulative GPA remains below 3.00 for a semester will be dismissed from the program.

- Students who transfer to the MSF program from other programs at Illinois (such as MSA, MSTM or MSFE) should coordinate with the MSF Academic Director on the specifics of their study plan; their study plan will take into account the courses they have taken in their prior studies at Illinois.

- Sponsored students are required to submit an approval letter from their sponsor to be permitted to carry a reduced course load in any semester.

- All MSF students should have their study plans approved by the MSF Academic Director.

In Fall 2022, many of you will want to participate in FIN 583 Practicum but it is not a required class. However, we will find enough projects for any student who wants to take part in the Practicum.

Fall 2021 Courses as of May 20, 2021 *Subject to change*

Required Courses and Electives recommended for future semesters

No.	Title	Credits	POT*	CRN	Instructor	Days	Times	Spring**
Core Courses *may be waived*								
502	Quantitative Finance	2	A	73104	Yang	MW	11 am–12:20 pm	Yes
502	Quantitative Finance	2	A	73105	Yang	MW	12:30–1:50 pm	Yes
504	Accounting for Fin Analysis	2	A	74444	Ibrahim	TR	8–9:20 am	Yes
580	Corporate Fin *(online only)*	4		48173	Smith	MW	8–9:20 am	Yes
580	Data Science & Python for Fin	2	AB	60285	Gao	F	9–10:20 am	Yes
Required Courses								
501	Econ Stock Market Fundamentals	4		56196	Miller	TR	11 am–12:20 pm	Yes
501	Econ Stock Market Fundamentals	4		56198	Miller	TR	12:30–1:50 pm	Yes
511	Investments	4		60176	Pollet	TR	9:30–10:50 am	Yes
511	Investments	4		60177	Pollet	TR	11 am–12:20 pm	Yes
511	Investments	4		60178	Pollet	TR	12:30–1:50 pm	Yes
581	Professional Development	2	B	75360	Smith	MW	6–7:20 pm	No
Electives recommended for first semester study								
432	Managing Fin Risk for Insurers	4		41642	Brobst	MW	2–3:20 pm	No
503	Quantitative Finance II	2	B	72860	Yang	MW	11 am–12:20 pm	Yes
503	Quantitative Finance II	2	B	72859	Yang	MW	12:30–1:50 pm	Yes
512	Financial Derivatives	4		32462	Duarte	TR	12:30–1:50 pm	Yes
512	Financial Derivatives	4		41693	Widdicks	MW	11 am–12:20 pm	Yes
518	Financial Modeling	4		75918	Brobst	MW	9:30–10:50 am	Yes
518	Financial Modeling	4		66735	Brobst	MW	11 am–12:20 pm	Yes
521	Advanced Corporate Fin	4		60181	Huang	MW	9:30–10:50 am	Yes
528	Cases in Financial Derivatives	4		73209	Peterson	MW	11 am–12:20 pm	No
535	Wealth Management	4		72912	Raskie	TR	9:30–10:50 am	No
545	Real Estate Investment	4		67123	Briggs	MW	12:30–1:50 pm	No
564	Applied Financial Analysis	4		73395	TBC	TR	9:30–10:50 am	Yes
579	Applied Portfolio Management	4		60753	Excell	TR	9:30–10:50 am	Yes
580	Adv Data Science in Python for Fin	2	AB	50081	Gao	F	10:30–11:50 am	Yes

POT means Part of Term. Two Credit Hour Courses typically run for the first 8 weeks of the semester (POT-A) or second 8 weeks (POT-B). Alternatively, they may run for the whole semester but with just one class per week (AB)

** This lists Courses that are usually available in the Spring semester. However, the spring schedule is not confirmed until around November 2021 and so this information is subject to change.*

Fall 2021 Courses as of May 20, 2021 *Subject to change*

Required Courses and Electives recommended for future semesters

No.	Title	Credits	POT*	CRN	Instructor	Days	Times	Spring**
Advanced Electives only recommended for third (second if available) **semesters**								
510	Big Data Analytics in Fin	4		72875	Molitor	MW	11 am–12:20 pm	Yes
514	Complex Derivative Securities	4		66394	Widdicks	MW	2–3:20 pm	Yes
516	Term Structure Models	2	A	72876	Widdicks	MW	9:30–10:50 am	No
517	Advanced Term Structure Models	2	B	72877	Widdicks	MW	9:30–10:50 am	No
522	Cases in Financial Strategy	4		70877	Zeume	MW	8–9:20 am	No
522	Cases in Financial Strategy	4		68319	Zeume	MW	9:30–10:50 am	No
552	Applied Financial Econometrics	4		72857	Kiku	MW	12:30–1:50 pm	No
553	Machine Learning in Finance	4		75849	Duarte	TR	8–9:20 am	No
553	Machine Learning in Finance	4		72854	Duarte	TR	11 am–12:20 pm	No
563	Investment Banking	4		67137	Metzger	TR	2–3:20 pm	No
566	Algorithmic Market Microstructure	4		67130	Lariviere	T	5–7:50 pm	No
580	Option Trading & Market-Making	4		65522	Natenberg	Th	5–7:50 pm	No
580	Microeconomic Theory I	4		58447	Miller	MWF	11 am–12:20 pm	No
582	Project Management *(Practicum)*	2		73443	Noonan	F	1–2:20 pm	No
582	Project Management *(Practicum)*	2		73444	Noonan	F	2–3:50 pm	No

*POT means Part of Term. Two Credit Hour Courses typically run for the first 8 weeks of the semester (POT-A) or second 8 weeks (POT-B). Alternatively, they may run for the whole semester but with just one class per week (AB)

** This lists Courses that are usually available in the Spring semester. However, the spring schedule is not confirmed until around November 2021 and so this information is subject to change.

Specializations

Students have the option to specialize in a particular area of finance, see below. Students choose an appropriate group of electives and including a prerequisite elective and a capstone elective. Specializations will be awarded to students who:

- Complete both the pre-requisite class and the capstone class in the specialization.
- Complete at least 16 credit hours in the chosen area. This includes the pre-requisite and capstone Courses, so most students will need to take an additional 8 credit hours of electives from the specialization.
- Achieve a B or better in all courses and an A in at least one of them.

Students satisfying these requirements receive an official letter from the MSF Academic Director as evidence of their specialization.

Note: Students may choose only one specialization.

Exceptions may be considered on a case-by-case basis but must be approved by the MSF Academic Director, after consideration of the student's career plans and background in finance and related disciplines.

Note: Upon approval by the MSF Academic Director, a) electives can be taken concurrently with prerequisite electives if those electives are not available in future semesters, b) a more advanced course can be used as a substitute for a prerequisite elective.

The areas of specialization are:

- Asset Management
- Corporate Finance
- Data Analytics and Fintech
- Quantitative Finance
- Finance Research *(PhD Preparation)*

Areas of Specialization & Career Opportunities in Finance

The MSF program offers courses in all areas of finance. These are: asset management, corporate finance, data analytics and fintech, quantitative finance, real estate, and finance research. Students can specialize in most of these areas by following a specialization track. By specializing in a specific area of finance, students become more marketable to employers in that area.

Students are faced with the following tradeoff: develop an expertise only in one area by taking several courses in that area or take courses across various areas. In the latter case, students must take into consideration that they may not develop sufficient expertise in any specific area given the limited number of courses that can be taken during a fifteen-month program of study.

Students can pursue careers in any of the above areas of finance. A very sought-after career path for finance students, for which there is no corresponding area of specialization in a typical graduate finance program, is investment banking. Investment banking encompasses two areas of finance: corporate finance and asset management. Investment banks specialize in either or both areas, but most banks look to hire graduates specializing in corporate finance. The reason is that corporate finance has been the traditional line of business for investment banks.

Description of Areas of Specialization in Finance

Asset Management

Asset (or investment) management involves managing portfolios of assets, typically including stocks, bonds and/or cash, for individuals and/or firms. Management of those assets takes place in professional investment firms. These are mutual funds, pension funds, and hedge funds. Mutual funds pool household savings and invest in stocks and bonds with the purpose of generating good returns. Pension funds pool retirement contributions and invest long term to generate funds for paying future pensions. Hedge funds raise funds with the purpose of generating high returns by taking advantage of arbitrage opportunities in the capital markets.

Investment firms or funds are comprised of senior managers with extensive experience in the area of investments assisted by a group of associates and analysts. Senior managers, such as mutual or pension fund managers, are responsible for defining the investment strategy of the fund. Associates and analysts provide support by analyzing and valuing specific assets (stocks, bonds, etc.) and providing recommendations for investments in these assets based on the overall investment strategy of the fund.

Students interested in this area can pursue the following career paths:

- Mutual/Pension Fund Career: A typical entry point in a mutual or pension fund is that of a securities analyst. This requires strong skills in investments, as well as good skills in stock valuation and accounting. Long term, the goal is to become a fund manager. A strong prerequisite for a successful career in asset management is the completion of the CFA exams. Very strong writing and communication skills are desirable for these positions.

- Hedge Fund Career: Hedge funds tend to be considerably smaller in employee size compared to mutual and pension funds. It is not uncommon for a hedge fund to have a team of less than 10 employees. However, the recent growth of the hedge fund industry has resulted in several multi-billion-dollar funds with very sophisticated structures. Employment in hedge funds requires very strong quantitative and computer programming skills, and knowledge of financial engineering. Students interested in this career path must take courses in quantitative finance and have strong quantitative and computer programming skills. Strong communication skills are not as important as for investment banking and asset management careers.

- Asset Management within an Investment Bank Career: Same skills as those described for mutual and pension funds, but might also require that candidates have good knowledge of quantitative finance depending on the team. Investment banks also expect employees to have very strong writing and communication skills.

Corporate Finance

Corporate finance involves financial decisions made within firms. These decisions are for the most part common to firms of any size. They involve identifying projects that a firm should invest, raising financing for these projects, and deciding how much of a firm's earnings should be returned to its owners. Pursuing a career in this area requires strong skills in corporate finance and accounting, as well as very good communication skills. One also needs to keep up-to-date with news concerning companies and the economy.

Students specializing in this area can pursue the following career paths:

- Corporate Career: This path leads to a career as a financial manager in a corporation. Corporate financial managers deal with the above-mentioned financial issues on a daily basis and must decide on the basis of maximizing the value of the firm. A typical starting point is that of a financial analyst with a large corporation (Boeing, GE, Caterpillar, Microsoft, Motorola, etc.). Analysts usually go through a series of rotations of six months or more in various departments within the firm (financial reporting, treasury, strategy, etc.). The goal for someone pursuing a corporate career is to become a Chief Financial Officer (CFO), which is often an intermediate step towards becoming a Chief Executive Officer (CEO).

- Investment Banking Career: This is the typical area of specialization for students interested in working for an investment bank. Investment banks provide consulting services to corporate clients for Mergers & Acquisitions (M&A), raising financing (Initial Public Offerings (IPOs), bond or equity issues in various international markets), and corporate strategy. Investment banks (or investment banking operations of bank holding companies) are categorized into three groups:

  - Bulge Bracket: These are the largest banks that offer all types of services and have both a domestic and a global presence. Familiar names are: Goldman Sachs, Morgan Stanley, Citigroup, UBS, etc.

  - Mid-tier: These banks have a more regional or industry focus. They may specialize in specific types of transactions, such as mid-cap firms. Familiar names are Stifel Nicolaus, Piper Jaffray, etc.

  - Boutique: These are smaller investment banks that are very specialized. They may be the best in specific areas of investment banking, for example small-size M&As or restructuring M&As, or specialize in one or two industries. Some names are William Blair; Brown, Gibbons, Lange; etc.

- Consulting Career: This path leads to employment in a consulting firm. These firms provide advice to corporations on corporate finance, accounting, and taxation issues. Familiar names are the consulting subsidiaries of the big four accounting firms, KPMG, PricewaterhouseCoopers (PWC), Deloitte, and Ernst & Young. This path typically requires good accounting and/or IT skills.

- Corporate Finance: Corporate Finance and Accounting are closely linked. Those pursuing careers in investment banking, consulting and corporate finance need the basic and more advanced knowledge provided by a coordinated approach to accounting and finance. A concentration in Accountancy is available for MSF students that specialize in Corporate Finance – see page 16 for details. Accounting class selections will be based upon the background of the candidate and evaluation by the MSF Director in coordination with the Accounting Department.

Data Analytics & Fintech

The area of Data Analytics and Fintech leverages the fast growing technologies in machine learning and artificial intelligence to exploit their tremendous potentials in financial industry. Data are quantifiable measures for financial analysis. In the era of digitalization, the data acquired or collected by corporations is increasing exponentially every day, including transactional data, financial data, report data, free-standing textual data etc. Data Analytics has to deal with large and complex datasets that can be structured, semi-structured, or unstructured and will typically not fit into traditional econometric modeling. For now, financial institutions such as hedge funds and large commercial banks have to rely on a non-traditional data analytical approach to deal with the large amount of alternative data. Hedge funds and asset management firms intend to identify trading patterns and signals, while commercial banks seek to reduce the transaction fee across borders, and quantify the risks related to personal lending.

Hedge funds, particularly high-frequency trading firms, are adopting a new machine learning based data analytic platform to participate with the already fierce competition. Asset management firms are hiring more analysts with data analytic and Fintech background for new strategies and product lines. Many new Fintech firms, e.g. robo-advisors, are embracing the technology to in an attempt to disrupt traditional industry.

Students interested in this area can pursue a broad career path, some possible areas include:

• Hedge Funds and Investment Banks: similar to the quantitative finance, the typical entry point is that of an analyst or associate in a trading or risk management firm. It just becomes that hedge funds focus more on trading pattern recognition, while the asset management firms prefer to work on new products, e.g. creating passive indexing funds or ETFs. Investment banks, commercial banks, and large corporations all expand their workforce in this area to satisfy the customization demand from investors and customers.

• Rating Corporations: The risk rating agencies including Morningstar, Moody's, etc. also expect the students in this field with innovative way to define and analyze risks of corporations.

• Emerging FinTech Companies: corporations whose business is tied to personal lending, P2P lending, crowd-founding, robo-advisors seek to employ people to grow their start-ups.

Students in this field are expected to have strong programming and analytic skills, but financial knowledge and communication skills are very important as well.

Quantitative Finance

Quantitative Finance (which also covers financial engineering or computational finance) is a field of finance that relies on mathematical models, numerical methods, and computer simulations to make trading, hedging, and investment decisions, as well as facilitating the risk management of those decisions. Quantitative Finance uses tools, of which financial derivatives is one, to synthetically create assets that can be used to solve risk management, taxation, regulation, and valuation problems.

The field is obviously highly quantitative and those pursuing a career in this area are often known as "quants". Students interested in a career in this field should have a strong background in quantitative analysis (mathematics and statistics) as well as in computer programming (knowledge of programming in Python and R is typically expected). In particular students would have a knowledge in stochastic processes, Monte Carlo simulation, binomial lattices (equity and interest rate models), real options and advanced modeling.

This area attracts students with engineering, mathematics, or physics backgrounds but increasingly a good knowledge of finance fundamentals and good communication skills are also important.

Students interested in this area can pursue a broad career path, some possible areas include:

- The typical entry point is that of an analyst or associate in a trading or risk management firm.

- Investment banks, commercial banks and other large corporations have their own risk management teams and seek employees with knowledge in this area.

- Financial institutions, especially venture capitalists and accounting firms have a need for complex securities valuation experts for funding and financial reporting purposes.

"Quants" are expected to have strong quantitative and programming skills; however communication skills are becoming increasingly important for successful job placement as well as being detail oriented and having intellectual curiosity with a knowledge of fundamental finance concepts.

Finance Research

Some students may be interested in an academic path and wish to apply for PhD programs upon graduation. Finance PhD programs can be very competitive, especially in the US, with many applicants and only a handful of openings at each university. However, successful Finance PhD students are often in demand from industry as well as academia and so it can also improve your career prospects.

To be successful in your application for a PhD program, quantitative skills are very important: statistics, econometrics, and math are essential as well as some knowledge of manipulating financial data. Also, knowledge of fundamental finance theories and of current finance research is essential. Professor Pennacchi, the Finance PhD director at Gies strongly recommends that students interested in PhD complete at least one PhD level class during their MSF studies to have the best possible chance with their applications. PhD Courses are typically 59X Courses and are marked on the course schedule.

Specialization details

All Courses are 4 credit hours unless indicated otherwise

Asset Management	
Prerequisite Elective: FIN 511 Investments *Fall/Spring*	**Other Electives:** *At least 8 credit hrs required* FIN 510 Big Data Analytics in Finance FIN 512 Financial Derivatives FIN 515 Fixed Income Portfolios FIN 518 Financial Modeling FIN 528 Cases in Financial Derivatives FIN 535 Wealth Management FIN 545 Real Estate Investment FIN 551 International Finance FIN 552 Applied Financial Econometrics FIN 563 Investment Banking FIN 564 Applied Financial Analysis FIN 580 Quantamental Investment FIN 580 Social Impact Investing (2)
Capstone Elective: FIN 579 Applied Portfolio Management *Fall/Spring*	

Corporate Finance	
Prerequisite Elective: FIN 521 Advanced Corporate Finance *Spring/Fall*	**Other Electives:** *At least 8 credit hrs required* FIN 510 Big Data Analytics in Finance FIN 518 Financial Modeling FIN 526 Enterprise Risk Management FIN 527 Mergers & Acquisitions FIN 551 International Finance FIN 561 Banking and Financial Regulation FIN 563 Investment Banking FIN 564 Applied Financial Analysis FIN 580 Growth Corp Capital Funding FIN 580 Entrepreneurship thru' Acquisition (2) ACCY 502 Accounting Analysis II ACCY 517 Financial Statement Analysis
Capstone Elective: FIN 522 Cases in Financial Strategy *Fall*	

Specialization details

All Courses are 4 credit hours unless indicated otherwise

Data Analytics & Fintech

Prerequisite Elective:

FIN 503
Quantitative Finance II (2)
Spring/Fall

FIN 580
Advanced Python for Finance (2)
Spring/Fall

Capstone Elective:

FIN 510
Big Data Analytics in Finance
Fall/Spring

Other Electives:
At least 8 credit hrs required

FIN 552 Applied Financial Econometrics
FIN 553 Machine Learning in Finance
FIN 555 Financial Innovation
FIN 567 Financial Risk Management
FIN 580 Financial Data Mgt. & Analysis
FIN 580 Quantamental Investment

Quantitative Finance

Prerequisite Elective:

FIN 512
Financial Derivatives
Spring/Fall

Capstone Elective:

FIN 514
Valuation of Complex
Derivatives Securities
Spring/Fall

Other Electives:
At least 8 credit hrs required

FIN 503 Quantitative Finance II (2)
FIN 513 Applications of Fin. Engineering
FIN 515 Fixed Income Portfolios
FIN 516 Term Structure Models (2)
FIN 517 Adv. Term Structure Models (2)
FIN 528 Cases in Financial Derivatives
FIN 552 Applied Financial Econometrics
FIN 553 Machine Learning in Finance
FIN 566 Algorithmic Market Microstructure
FIN 567 Financial Risk Management
FIN 580 Options Trading & Market Making
FIN 580 Quantamental Investment
FIN 580 Advanced Python for Finance (2)
FIN 580 Basics of Trading Algorithm Design (2)
FIN 580 Analysis and Testing of Trading Algorithms (2)

Finance Research *PhD preparation*

Prerequisite Elective:

FIN 591
Theory of Finance
Fall

Capstone Elective:

FIN 552
Applied Financial Econometrics
Fall

or FIN 592
Empirical Analysis in Finance

Other Electives:

FIN 580 Financial Data Management & Analysis
FIN 580 Microeconomic Theory I
FIN 594 Seminar in Corporate Fin *Spring*
FIN 594 Seminar in Corporate Fin *Fall*

Concentrations

According to the Graduate College a concentration is "an elaboration or an extension of a graduate major: either content specialization within a particular discipline (for example, a taxation concentration in accountancy, or an interdisciplinary program (for example, an interdisciplinary concentration in cultural studies and interpretive research). A concentration is a coherent set of courses some or all of which count toward the major."

Historically very few MS Finance students have pursued concentrations but due to changes in the curriculum, now it is possible to pursue the following three concentrations:

Graduate Concentration in Accounting

Note: Due to timetabling constraints and strong demand for seats in Accounting courses it can be challenging to achieve the requirements of the Accounting concentration. If you are interested you should immediately speak with Martin Widdicks, the MSF Academic Director.

The concentration is open to Master of Science in Finance students. Candidates will apply to the Department of Accounting for admission into the concentration. Students wishing to be admitted to the concentration should consult with their program advisor before applying. The concentration will appear on transcript.

You are required to complete the following three Courses:

- ACCY 501 Accounting Analysis I (Fall)
- ACCY 502 Accounting Analysis II (Fall/Spring) *ACCY 501 is a prerequisite*
- ACCY 503 Managerial Accounting (Spring) *No prerequisite*
- OR ACCY 517 Financial Statement Analysis (Spring) *ACCY 501 is a prerequisite*

Graduate Concentration in Data Analytics in Finance

The concentration is open to Master of Science in Finance and Master of Science in Financial Engineering. Candidates will apply to the Department of Finance for admission into the concentration. Students wishing to be admitted to the concentration should consult with their program advisor before applying. The concentration will appear on transcript.

You are required to complete the following class:

- FIN 510 Big Data Analytics in Finance

    And any two of the following Courses:
- FIN 552 Applied Financial Econometrics
- FIN 553 Machine Learning in Finance
- FIN 555 Financial Innovation
- FIN 567 Financial Risk Management
- FIN 580 Financial Data Mgt. & Analysis
- FIN 580 Quantamental Investment

Graduate Concentration in Business and Public Policy

Today's business leaders must make strategic decisions in an extremely complex world. In addition to navigating the rapidly changing market forces in their industry, companies operate in an environment that is strongly influenced by regulatory and public policy considerations. Furthermore, our public sector leaders must also understand how market forces can help or hinder alternative solutions to society's most pressing problems. The business and public policy graduate concentration is designed to provide graduate business students a framework for evaluating the impact of public policy on firms and the markets in which they operate.

The concentration is open to MSF students. Candidates will apply to the Department of Finance for admission into the concentration. Students wishing to be admitted to the concentration should consult with their program advisor before applying. The concentration will appear on transcript.

To achieve the concentration students must complete 12 hours including Courses from the following list (other Courses can be determined by meeting with the Martin Widdicks, the MSF Director):

- FIN 570 Business and Public Policy
- FIN 571 Retirement Policy
- FIN 572 Health Care Policy

MS Finance Course Descriptions

The strength of Finance at Illinois is the breadth and the depth of the curriculum. The strong foundation coupled with the specialization options gives you the flexibility to design a program to meet your personal goals.

Core Courses Fall 2021

Finance 580 XCF: Corporate Finance (Prof. Smith)
This course will cover a broad range of corporate finance topics providing a comprehensive overview of the material. At the conclusion of the course, students will understand the broad fundamental concepts of corporate finance in a unifying model. The text we will be using provides an excellent introduction to the concepts. Topics can be explored in more detail based on class interest and experience. *(Required but may be waived if the student has the appropriate training at undergraduate level)*

Finance 502: Quantitative Finance (Prof. Yang)
This course provides an introduction to quantitative methods that are applicable in several areas of finance; presents concepts and methodologies from probability theory, statistical inference, and regression analysis; emphasis is placed on software applications of real data on stock returns, CAPM and Fama-French models, and cross-section firm data. *(Required but may be waived if the student has the appropriate training at undergraduate level)*

Finance 504: Accounting for Financial Analysis (Prof. Ibrahim)
Introduces the fundamentals of reading and understanding financial statements. The basics financial statements will be introduced and there will be in depth examples and cases demonstrating how the statements are constructed and how to carry out basic analysis. At the end of the class students should feel comfortable understanding a typical annual report. *(Required but may be waived if the student has the appropriate training at undergraduate level)*

Finance 580: Data Science & Python for Finance (Prof. Gao)
The financial industry is increasingly adopting Python. Libraries such as NumPy and pandas provide extraordinary insights into data analysis. This course focuses specifically on introducing Python for financial analysis. The first part of the course provides a detailed understanding of Python basics. Data structures, numerical computing with NumPy, and data analysis with pandas will be explained. The second part applies Python in solving problems in corporate finance and performing investment analysis. Topics include capital budgeting decisions, equity valuation, risk and return, portfolio optimization, and technical trading strategies. *(Preparatory class)*

Fall 2021 Required Courses

Finance 501: Economics of Stock Market Fundamentals (Prof. Miller)
Firms' long-run value ultimately depend on their business fundamentals. This course covers micro- and macro-economic drivers of such fundamentals, such as consumer demand, market competitiveness, government regulation, interest rates, business cycles, and monetary policy. Also includes topics in risk and intertemporal decision-making. *(Required)*

Finance 511: Investments (Prof. Pollet).
Introduction to investment analysis, including the theory and implementation of portfolio theory, empirical evidence on the performance of financial assets, evaluation of portfolio investment strategies, and the extension of diversification to international markets. *(Required/Asset Management)*

Fall 2021 Electives

Finance 503: Quantitative Finance II (Prof. Yang)
A continuation of Quantitative Finance. This course covers more advanced quantitative methods that are applicable in several areas of finance; presents concepts and methodologies from probability theory, statistical inference, and regression analysis; emphasis is placed on software applications of real data on stock returns, CAPM and Fama-French models, and cross-section firm data. *(Quantitative Finance/Data Analytics and Fintech)*

Finance 510: Big Data Analytics (Prof. Molitor)
Recent trends in "big data" present both enormous challenges and opportunities for businesses. This course introduces concepts and techniques of business data analytics and shows how they can be used for making predictions and to distinguish between correlation and causation. Covered tools include data visualization, machine learning, regression analysis, randomized trials, A/B testing, and quasi-experiments. Students will apply these tools using R programming. *(Asset Management/ Corporate Finance/ Data Analytics and Fintech)*

Finance 512: Financial Derivatives (Prof. Widdicks/Prof. Duarte)
Introduction to options, futures, swaps and other derivative securities; examination of institutional aspects of the markets; theories of pricing; discussion of simple as well as complicated trading strategies (arbitrage, hedging, and spread); applications for asset and risk management. *(Asset Management/Quantitative Finance)*

Finance 514 Valuation of Complex Derivatives Securities (Prof. Widdicks)
We focus on three main numerical techniques for valuing derivatives or securities with embedded derivatives: Binomial trees, Finite-difference, and Monte-Carlo methods. For each technique we will first understand the theory behind the technique, then we will implement the technique, and finally we use it to value real world products. If time permits, we will also look at term structure models and the calibration of tree methods to market data and the valuation of complex interest rate derivatives. Assessment is based upon short valuation projects and tests on the theoretical aspects. Previous knowledge of programming is not essential but will be helpful. *(Quantitative Finance)*

Finance 516 Term Structure Models (Prof. Widdicks) (MSFE class)
Coverage of the fundamental models of the term structure of interest rates, including their implementation, calibration, and use in valuing interest rate derivatives. Focus will be on the Black model and short rate models such as Black-Derman-Toy and Hull-White. *(Quantitative Finance)*

Finance 517 Advanced Term Structure Models (Prof. Widdicks) (MSFE class)
This class is a continuation of FIN 516 Term Structure Models. Coverage of advanced term structure models with a focus on the LIBOR Market Model (LMM). Students will learn the theory behind the model, how to calibrate the model to data and how to to develop numerical algorithms in order to implement the model to price a variety of real world interest rate products. *(Quantitative Finance)*

Finance 518: Financial Modeling (Prof. Brobst),
Our objective in this course is to learn the fundamentals and the rules of best practice in building financial models using Microsoft Excel. By the end of the semester each student should be able develop an understanding of any financial relationship and build that financial relationship into a model using the built-in functions of excel and entry level VBA. *(Asset Management/Corporate Finance)*

Finance 521: Advanced Corporate Finance (Prof. Huang)
Addresses both the theoretical and applied aspects of firms' financing decisions; topics include capital structure and cost of capital theories; mergers, acquisitions and leveraged buyouts; options, warrants, and convertibles; venture capital and initial public offerings; and pensions. *(Corporate Finance)*

Finance 522: Cases in Financial Strategy (Prof. Zeume)
Course focuses on financial management cases and provides student with an active learning experience. Case work is based on concepts learned in introductory corporate finance. Topics discussed include measuring and interpreting cash flow performance, financial forecasting and turnaround management; capital investment and cost of capital; and capital structure, dividend policy; and firm valuation. *(Corporate Finance)*

Finance 528: Cases in Financial Derivatives (Prof. Peterson)
This advanced elective course on financial derivatives explores the economic, legal, and regulatory concepts underlying these markets. It uses case studies to examine market weaknesses, design flaws, and regulatory breakdowns, many of which have resulted in major disasters. *(Asset Management/ Quantitative Finance)*

Finance 535: Wealth Management (Prof. Raskie)
This course studies personal wealth management techniques with an emphasis on life insurance products; covers life insurance policies, annuities, trusts, buy-sell arrangements, investing in stocks, bonds and mutual funds, banking and borrowing, purchasing residential and commercial real estate, income and estate taxation and management of personal financial portfolio. The course also allows students to build a wealth management plan based on a case scenario. *(Asset Management)*

Finance 545: Real Estate Investments (Prof. Briggss)
Real estate accounts for one-third of the world's capital assets. This course provides students with a comprehensive understanding of real estate valuation, cycles, markets, investments, and decision-making. The bulk of the course covers income-producing commercial property, although we will also discuss residential housing. This course provides a unified finance based framework to answer real estate investment decision making problems in the real world. *(Asset Management)*

Finance 552: Applied Financial Econometrics (Prof. Kiku)
The aim of this course is to equip students with a working knowledge of important econometric techniques necessary to understand and interpret financial market data. The course covers time-series and cross-sectional properties of asset returns, empirical tests of asset pricing models, market efficiency and predictability of stock returns, measurement and modelling of volatility. *(Asset Management/Data Analytics and Fintech/Quantitative Finance/Finance Research)*

Finance 553: Machine Learning (Prof. Duarte)
Machine Learning includes the design and the study of algorithms that can learn from experience, improve their performance and make predictions. In this course students will learn the foundations of Machine Learning and explore state of the art algorithms and tools. Topics include supervised learning (neural networks, support vector machines), unsupervised learning (clustering, dimensionality reduction) and reinforcement learning (dynamic programming, Q-learning, SARSA, policy gradient methods). Applications include option pricing, portfolio selection and credit card fraud detection. Students will gain practical experience implementing these models in Python with frequently used packages such as TensorFlow. *(Data Analytics and Fintech/Quantitative Finance)*

Finance 563: Investment Banking (Prof. Metzger)
This course will provide key building blocks necessary for a career in investment banking, valuation and other related fields. It is designed to provide a practical application of financial statement analysis, modeling, valuation, and presentation skills commonly performed by industry professionals. The course has three major parts. The first focuses on the mechanics of financial statement analysis, ratio analysis, and financial model building. The second applies the financial statements and forecasts within the context of company valuation, utilizing common industry techniques. In the third part of the course, we will employ these valuation techniques in common investment-banking deliverables such as pitch books and fairness opinions. *(Asset Management/ Corporate Finance)*

Finance 564: Applied Financial Analysis (Prof. Maple)
This course is designed to provide a practical approach to analyzing and interpreting complex financial statements (income statement, balance sheet and cash flow statement) to make decisions from a range of user perspectives, including investment banks, equity investors and commercial banks. Advanced financial analysis and forecasting will be applied through assignments and casework. There will be an emphasis on business writing skills commonly applied by finance professionals. As financial analysis is critical to so many careers in finance, this course will help you better understand financial statements, teach you approaches to analyzing and communicating them, evaluate the sophistication and integrity of a company's management team, and make you a better employee as you start and progress in your career. Prerequisites: ACCY 501 or equivalent. A baseline understanding of basic financial accounting is expected of all students coming into this course. Students may enroll without the prerequisites with the approval of the instructor. *(Asset Management/ Corporate Finance)*

Finance 566: Algorithmic Market Microstructures (Prof. Lariviere) (MSFE class)
This course introduces the modern theoretical, empirical and institutional foundations of market microstructure and trading activity, with an emphasis on applications to algorithmic and high-frequency trading. The first part of the course addresses market microstructure and the algorithmic implementation of traditional microstructure-inspired tasks such as minimizing execution costs. The second part of the course proceeds to examine actual algorithmic strategies, and ultimately high-frequency trading. Recurrent themes throughout the course will be the use of economic theory to simplify computationally challenging problems, and the use of theory-driven structural models to construct more robust trading algorithms. *(Quantitative Finance)*

Finance 579: Applied Portfolio Management (Prof. Excell)
Applies academic topics on financial markets, security analysis/valuation and portfolio management to hands-on investment management. Students will form and review objectives, constraints, and investment policy as it relates to the client's money under management. They will purchase securities, monitor performance of the portfolio, and make recommendations for any adjustments to the holdings. They will be fully educated and responsible for the fiduciary and ethical standards of professional money management as guided by the CFA Institute. May be repeated to a maximum of 8 hours. *(Asset Management)*

Finance 580: Advanced Data Science & Python for Finance (Prof. Gao)
Advanced Data Science & Python for Finance. This course aims to expand your knowledge in Python and provide data analytics tools to solve problems in finance. The first part of the course presents advanced topics in pandas, including hierarchical indexing, data manipulation, handling missing values, and data visualization. The second part of the course focuses on analyzing data and solving real-world problems such as investigating market responses to earnings announcements, comparing value and growth investing, forecasting stock prices, predicting bankruptcy, and estimating house prices. By the end of the term, you will gain competency in performing financial analysis using Python. *(Data Analytics and Fintech/Quantitative Finance)*

Finance 580 OPT: Option Trading Market Making (Prof. Natenberg), MSFE Class takes place online
This course will focus on how option theory is actually applied by option traders and market-makers to achieve their desired goals. The class will include sections on the mechanics of trading and market organization, as well as a review of basic option theory and commonly used pricing models. From this, we will examine a variety of trading and market-making strategies, with special emphasis on both the theoretical and real-world risks which option trading entails. Lastly, we will look at some of the realized and implied volatility contracts which have become such popular trading instruments. *(Quantitative Finance)*

Finance 580 GMT: General Microeconomic Theory (Professor Miller) PhD Level Class, please contact professor
PhD level class on Microeconomics (Finance Research)

Finance 582: Project Management (Prof. Noonan)
This class is taken in conjunction with FIN 583: Practicum. This course is all about learning by doing. It is designed to assist you in your real-world experience as you work in a team with a real organization to help solve a problem the organization is facing. In class, we will help you gain the skills you will need to successfully complete the project. If you work hard in this class, you will have a compelling story to tell as you interview for internships and jobs and you will gain skills that will help you succeed in your career.

Finance 582/583: Project Management (Prof. Noonan) and Practicum (Prof. Maple)
A semester-long, typically corporate-sponsored, team project for MSF students that is usually completed by the end of the third semester of study. The goals of the Practicum are: a) to use learned or new tools on real world projects of interest to the corporate sponsor; b) to replicate as closely as possible the environment of the working world where students will soon find themselves employed; c) to work cohesively with other members of a team so as to efficiently produce the desired project results; and d) to be able to communicate effectively with technical and non-technical audiences, which may include the sponsor and/or co-workers.

Finance 591: Theory of Finance (Prof. Pennacchi) PhD Level Class, please contact professor
NOT OFFERED IN FALL 2021
Examines the theory of individuals' savings and portfolio choice decisions and their equilibrium asset pricing implications. The course considers single-period and multi-period models, the latter both in discrete-time and continuous-time. Models where individuals have non-standard utility and heterogeneous information are also considered, along with frameworks for evaluating derivative securities and credit risk. *(Finance Research)*

Finance 592: Empirical Analysis in Finance (Prof. Kiku) PhD Level Class, please contact professor
NOT OFFERED IN FALL 2021
This course is an introduction to empirical finance with a focus on selected topics and econometric methods. The course will cover time-series and cross-sectional properties of asset returns, empirical tests of asset pricing models, present-value relations and predictability, and other topics time permitting. The interplay between asset pricing theories, statistical assumptions and relevant econometric techniques is explored in the context of published empirical work, including classical papers as well as a more recent research. Note that this course is designed for Ph.D. students. Interested MSF students should instead register for Applied Financial Econometrics and discuss whether they are suited for 592 with Professor Kiku. *(Finance Research)*

Finance 594: Seminar in Corporate Finance (Prof. Almeida) PhD Level Class, please contact professor
NOT OFFERED IN FALL 2021
Theories, paradigms, and models of nonfinancial corporations; investigates the theoretical foundations and empirical evidence regarding corporate resource allocation, capital structure decisions, and dividend policies; covers in detail contingent claim analysis, signaling theory, and agency theory. *(Finance Research)*

Non-Finance Electives: Fall 2021

Note: Please contact Holly Kizer if you wish to register for non-Finance Courses, with the exception of Accountancy 501.

Accountancy 501 MSF Section Only: Accounting Analysis I
Uses of accounting information; collection, processing, and communication of accounting information; measurement of assets, liabilities, equities, and income; and accounting system design.

Economics 505: Introduction to Game Theory
Applications of game theory. Introduction to basic static games and dynamic games with particular attention to applying these games to real world situations.

Economics 516: Monetary Theory
Micro- and macroeconomic theories of the supply of and demand for money; money substitutes and their significance; review of current empirical research; money in closed economy, macroeconomic, and static general equilibrium models; and analysis of inflation and unemployment.

Statistics 542: Statistical Learning
Modern techniques of predictive modeling, classification, and clustering are discussed. Examples of these are linear regression, nonparametric regression, kernel methods, regularization, cluster analysis, classification trees, neural networks, boosting, discrimination, support vector machines, and model selection. Applications are discussed as well as computation and theory.

Statistics 555: Applied Stochastic Processes
Introduction to topics such as spectral analysis, filtering theory, and prediction theory of stationary processes; Markov chains and Markov processes.

Spring 2022 Electives

Note that all core and required courses will also be offered in Spring 2022 with the exception of Fin 581 Professional Development

Finance 503: Quantitative Finance II (Prof. Yang)
A continuation of Quantitative Finance. This course covers more advanced quantitative methods that are applicable in several areas of finance; presents concepts and methodologies from probability theory, statistical inference, and regression analysis; emphasis is placed on software applications of real data on stock returns, CAPM and Fama-French models, and cross-section firm data. *(Quantitative Finance/Data Analytics and Fintech)*

Finance 510: Big Data Analytics in Finance for Predictive and Causal Analysis (Prof. Molitor)
Recent trends in "big data" present both enormous challenges and opportunities for businesses. This course introduces concepts and techniques of business data analytics and shows how they can be used for making predictions and to distinguish between correlation and causation. Covered tools include data visualization, machine learning, regression analysis, randomized trials, A/B testing, and quasi-experiments. Students will apply these tools using R programming. *(Asset Management/ Corporate Finance/ Data Analytics and Fintech)*

Finance 512: Financial Derivatives (Prof. Peterson)
Introduction to options, futures, swaps and other derivative securities; examination of institutional aspects of the markets; theories of pricing; discussion of simple as well as complicated trading strategies (arbitrage, hedging, and spread); applications for asset and risk management. *(Asset Management/Quantitative Finance)*

Finance 513: Applications of Financial Engineering (Prof. Johnson)
A survey of the field of financial engineering, introducing the kinds of problems it can solve in asset management, corporate finance, banking, and non-profit sectors. The course builds on the techniques of no-arbitrage pricing, and extended modeling of multidimensional risks is developed in order to study more complex problems (including stochastic volatility) and more complex securities (such as synthetic credit products). Assignments include both numerical computation and case studies. *(Quantitative Finance)*

Finance 514: Valuation of Complex Derivatives Securities (Prof. Widdicks)
We focus on three main numerical techniques for valuing derivatives or securities with embedded derivatives: Binomial trees, Finite-difference, and Monte-Carlo methods. For each technique we will first understand the theory behind the technique, then we will implement the technique, and finally we use it to value real world products. If time permits, we will also look at term structure models and the calibration of tree methods to market data and the valuation of complex interest rate derivatives. Assessment will be based upon short valuation projects and tests on the theoretical aspects. Previous knowledge of programming is not essential but will be helpful. *(Quantitative Finance)*

Finance 515: Fixed Income Portfolios (Prof. Kargar)
The course analyzes the major government, corporate, and consumer debt instruments and the nature of their interest rate risks and credit risks. There is also coverage of the most common types of interest rate derivatives and single name and portfolio credit derivatives. The course focuses on techniques used to value and hedge default-free and defaultable debt and various interest rate and credit derivative contracts. *(Asset Management/ /Quantitative Finance)*

Finance 518: Financial Modeling (Prof. Brobst),
Our objective in this course is to learn the fundamentals and the rules of best practise in building financial models using Microsoft Excel. By the end of the semester each student should be able develop an understanding of any financial relationship and build that financial relationship into a model using the built-in functions of excel and entry level VBA. *(Asset Management/Corporate Finance)*

Finance 521: Advanced Corporate Finance (Prof. Wu/Prof. Spencer)
Addresses both the theoretical and applied aspects of firms' financing decisions; topics include capital structure and cost of capital theories; mergers, acquisitions and leveraged buyouts; options, warrants, and convertibles; venture capital and initial public offerings; and pensions. *(Corporate Finance)*

Finance 527: Mergers and Acquisitions (Prof. Almeida)
Focuses on identifying ways to increase firm value through mergers and acquisitions (M&A) and corporate restructurings. We will develop your skills in the design and evaluation of transactions. Specific topics addressed in the course are the valuation of companies, structuring of transactions, deal tactics and strategy, valuation of leveraged buyouts, and spin-offs/carve-outs. We will also delve into issues of law, accounting and taxation and how they affect the structuring and outcome of merger transactions. Knowledge about M&A is an important component of any corporate finance professional and is the foundation for effective work in a wide range of fields including corporate development, investment banking, consulting, and advising senior management. *(Corporate Finance)*

Finance 551: International Finance (Prof. Chan)
Explores the characteristics of the international financial market and examines various aspects of corporate financial management. Topics may include international parity conditions, exchange rate risk management, country risk, cross-border investment analysis, multi- national firm budgeting, hedging in foreign currency markets, accessing international financial markets for financing, and competitive strategy in a global marketplace. *(Asset Management/Corporate Finance)*

Finance 555: Financial Innovation (Prof. Ye)
Recent years have seen the rapid development of the fintech sector, bringing together technology and data, startups and established firms in ways that are likely to shape and disrupt financial markets going forward. This course will involve a mix of lectures, guest speakers, and class discussion of breaking developments and new ventures. Some of the fintech sectors we will discuss include consumer finance, payments, investing and trading, cryptocurrencies and blockchain, and regulatory concerns. A part of your grade would consist of a group project detailing a fintech startup idea, an analysis of an existing fintech business, or an analysis of a fintech sector. *(Data Analytics and Fintech)*

Finance 561: Banking and Financial Regulation (Prof. Irani)
Studies financial intermediation emphasizing analysis of problems faced by commercial bank managers. The three main areas covered are: 1) the role of financial intermediation and its relation to the macro-economy, information technology, and government regulation; 2) examination of the problems of pricing and evaluating the risk of bank financial services such as loans, loan commitments, and swaps; and 3) consideration of bank portfolio risk management. *(Corporate Finance)*

Finance 564: Applied Financial Analysis (Prof. Maple)
Provides key building blocks necessary for many careers in finance. Designed to provide a practical approach to analyzing and interpreting complex financial statements to make decisions from a range of user perspectives, including investment banks, equity investors and commercial banks. Advanced financial analysis and forecasting will be applied through assignments and casework. There will be an emphasis on business writing skills commonly applied by finance professionals. *(Asset Management/ Corporate Finance)*

Finance 567: Risk Management (Prof. Pearson)
The course will offer an introduction to the field of financial risk management, with an emphasis on the practices of the specialist market and credit risk functions at large financial institutions. Many of the ideas and techniques used at large financial institutions are also applicable at smaller institutions and more specialized financial organizations such as proprietary trading firms and asset management companies. The topics covered will include the management of market risk, including vanilla and exotic options risk, credit risk, operational risk, model risk, and statistical techniques for risk measurement such as value-at-risk. *(Data Analytics and Fintech/Quantitative Finance)*

Finance 579: Applied Portfolio Management (Prof. Excell)
Applies academic topics on financial markets, security analysis/valuation and portfolio management to hands-on investment management. Students will form and review objectives, constraints, and investment policy as it relates to the client's money under management. They will purchase securities, monitor performance of the portfolio, and make recommendations for any adjustments to the holdings. They will be fully educated and responsible for the fiduciary and ethical standards of professional money management as guided by the CFA Institute. May be repeated to a maximum of 8 hours. *(Asset Management)*

Finance 580: Advanced Data Science & Python for Finance (Prof. Gao)
Advanced Data Science & Python for Finance. This course aims to expand your knowledge in Python and provide data analytics tools to solve problems in finance. The first part of the course presents advanced topics in pandas, including hierarchical indexing, data manipulation, handling missing values, and data visualization. The second part of the course focuses on analyzing data and solving real-world problems such as investigating market responses to earnings announcements, comparing value and growth investing, forecasting stock prices, predicting bankruptcy, and estimating house prices. By the end of the term, you will gain competency in performing financial analysis using Python. *(Data Analytics and Fintech/Quantitative Finance)*

Finance 580: Financial Data Management and Analysis. (Prof. Gao)
Financial Data Management and Analysis. Proper data handling and management is essential to the success of data analysis. The primary goal of this course is to learn principles and practices of data management with an emphasis on working with financial databases. Students will gain practical skills in data storage, data preparation, and data extractions that eventually lead to data analysis. Data management procedures including SQL queries, and data analysis techniques using large-scale statistical software are presented. *(Data Analytics and Fintech)*

Finance 580: Quantamental Investment (Prof. Zhang)
The phrase: from Data to Information, and from Information to Knowledge, has become a cliché but it has never been as fitting as today. With the emergence of Big Data, Artificial Intelligence, and the need to make sense of the massive amounts of disparate collection of Financial and alternative datasets, there is a requirement for financial researchers of data-driven domains to employ a rich set of analytic methods in the FinTech domain.

This course introduces concepts and techniques of AI-based data analytics in FinTech applications, including investment management, financial trading, and cryptocurrency & Blockchain. Topics covered include two main parts, 1) Python for Finance and Fundamental Data Analytics in Finance; 2) Practical Applications in corporate finance analysis, equities investment, bonds and other fixed income products, cryptocurrency and blockchain. Students will have the opportunity to work with financial experts closely in the course, during which students will be partnered with their mentors, most of whom are current financial experts, given students' interests and mentors' capacity, to conduct a course project that related to the topics discussed in the class. *(Data Analytics and Fintech/Quantitative Finance)*

Finance 580 DB: Social Impact Investing (Prof. Brown)
Social impact investing may be described as a bridge between two well-established disciplines, private equity and philanthropy. Like philanthropy, impact investing is driven by an intention to create a positive societal or environmental change in its investment sphere. Incorporating process methods of the private equity model, we will review direct investment strategies and consider various ways to leverage capital markets as part of mission-driven efforts. This course considers the perspective of both investor and manager/entrepreneur in seeking paths for solving intractable societal problems while generating financial return.

Finance 580 ETA: Entrepreneurship through Acquisition (Prof. Smith)
Entrepreneurship Through Acquisition (ETA) is the exciting career path where business professionals buy and grow existing small businesses. For individuals with business skills and a desire to make a meaningful impact, this path is significantly less risky than starting new businesses around unproven product or service ideas. The course will introduce ETA and cover how to search for, value, finance, and grow small business acquisitions. Invited speakers include entrepreneurs and acquisition professionals. No prior background in finance is required. *(Corporate Finance)*

Finance 580 GCF: Growth Corporate Capital Funding (Prof. Sholem)
Details forthcoming (Corporate Finance)

FIN 580 A1: Basics of Trading Algorithm Design (Prof. B. Peterson)
Basics of Trading Algorithm Design. Course is open to City Scholars. Basics of Trading Algorithm Design will focus on the structure of quantitative strategies, and on the different types of strategies used in production by trading firms and asset managers. The second half of the semester, Deeper Analysis of Algorithm Testing, will focus on more advanced techniques for model evaluation, feature engineering, and using modern methods such as machine learning, as well as practical application of these skills to strategy building. This course will provide a detailed research process and tools for assessing, conceptualizing, replicating, and developing systematic trading strategies. Students will apply their knowledge in hands-on projects to replicate and evaluate existing research and to create and evaluate a new strategy model. Development of systematic trading strategies should follow a highly scientific and repeatable process. This course will start by reviewing categories of systematic strategies, drawing out patterns followed throughout the industry. *(Quantitative Finance)*

FIN 580 A2: Analysis and Testing of Trading Algorithms (Prof. B. Peterson)
Analysis and Testing of Trading Algorithms. Course is open to City Scholars. Basics of Trading Algorithm Design, during the first half of the semester, focused on the structure of quantitative strategies, and on the different types of strategies used in production by trading firms and asset managers. Deeper Analysis of Algorithm Testing will focus on more advanced techniques for model evaluation, feature engineering, and using modern methods such as machine learning, as well as practical application of these skills to strategy building This course will provide a detailed research process and tools for assessing, conceptualizing, replicating, and developing systematic trading strategies. Students will apply their knowledge in hands-on projects to replicate and evaluate existing research and to create and evaluate a new strategy model. Development of systematic trading strategies should follow a highly scientific and repeatable process. This course will start by reviewing categories of systematic strategies, drawing out patterns followed throughout the industry. *(Quantitative Finance)*

Finance 594: Seminar in Corporate Finance (Prof. Irani) PhD Level Class, please contact professor
Theories, paradigms, and models of nonfinancial corporations; investigates the theoretical foundations and empirical evidence regarding corporate resource allocation, capital structure decisions, and dividend policies; covers in detail contingent claim analysis, signaling theory, and agency theory. *(Finance Research)*

Non Finance Electives: Spring 2022
Note: Please contact Holly Kizer if you wish to register for non-Finance Courses.

Accountancy 517 Section F only: Financial Statement Analysis (Instructor TBA)
An in-depth analysis of financial reporting from a user's perspective, using a variety of tools to break apart financial reports into meaningful units for analysis, forecasting financial statements, and valuing a firm; supplements material covered in corporate finance and valuation course. *(Corporate Finance)*

Economics 503: Econometrics (Instructor TBA)
Develops a general methodological basis for searching for quantitative economic knowledge; integrates and gives operational content to the topics of economic, statistical, and econometric theory.

Economics 514: International Financial (Instructor TBA)
Theories of money; money in dynamic models; money in open economy macroeconomic models; stabilization policy; and international aspects of monetary theory.

Statistics 542: Statistical Learning (Instructor TBA)
Modern techniques of predictive modeling, classification, and clustering are discussed. Examples of these are linear regression, nonparametric regression, kernel methods, regularization, cluster analysis, classification trees, neural networks, boosting, discrimination, support vector machines, and model selection. Applications are discussed as well as computation and theory.

Provisional Study Plan for Asset Management Track

Fall 1
FIN 501 Economics of Stock Market Fundamentals (required class)
FIN 511 Investments (required class, prerequisite class for specialization)
FIN 512 Financial Derivatives
FIN 581 Professional Development (required class, 2 credit hours)

Other Courses within specialization: FIN 518 Financial Modeling, FIN 528 Cases in Financial Derivatives, FIN 535 Wealth Management, FIN 564 Applied Financial Analysis, FIN 579 Applied Portfolio Management (Capstone)

Other useful Courses: Core Courses, FIN 503 Quantitative Finance II, FIN 521 Advanced Corporate Finance, FIN 545 Real Estate Investments, FIN 580 Advanced Data Science and Python for Finance.

Spring
FIN 510 Big Data Analytics
FIN 515 Fixed Income Portfolios
FIN 564 Applied Financial Analysis

Others within specialization: FIN 518 Financial Modeling, FIN 551 International Finance, FIN 579 Applied Portfolio Management (Capstone), FIN 580 Quantamental Investment

Other useful Courses: FIN 521 Advanced Corporate Finance, FIN 555 Financial Innovation, FIN 561 Banking and Financial Regulation, FIN 580 Entrepreneurship through Acquisition (2), ACCY 517 Financial Statement Analysis

Fall 2
FIN 563 Investment Banking
FIN 579 Applied Portfolio Management (capstone class for specialization)
FIN 582 Project Management (required for Practicum) (not part of specialization)
FIN 583 Practicum (not part of specialization)

Others within specialization: FIN 510 Big Data Analytics in Finance, FIN 518 Financial Modeling, FIN 528 Cases in Financial Derivatives, FIN 535 Wealth Management, FIN 552 Applied Financial Econometrics.

Provisional Study Plan for Corporate Finance Track

Fall 1

FIN 501 Economics of Stock Market Fundamentals (required class)
FIN 511 Investments (required class)
FIN 521 Advanced Corporate Finance (prerequisite class for specialization)
FIN 581 Professional Development (required class, 2 credit hours)

Others within specialization: FIN 518 Financial Modeling, FIN 564 Applied Financial Analysis

Other useful Courses: Core Courses, FIN 503 Quantitative Finance II (2 credit hours), FIN 512 Financial Derivatives, FIN 504 Financial Statements (2 credit hours), ACCY 501 Accounting Analysis I

Spring

FIN 510 Big Data Analytics
FIN 527 Mergers and Acquisitions
FIN 561 Banking and Financial Regulation
FIN 564 Applied Financial Analysis

Others within specialization: FIN 518 Financial Modeling, FIN 551 International Finance, FIN 580 Growth Corp Capital Funding, FIN 580 Entrepreneurship through acquisition (2 credit hours), ACCY 517 Financial Statement Analysis

Other useful Courses: FIN 503 Quantitative Finance II (2 credit hours), FIN 512 Financial Derivatives, FIN 555 Financial Innovation, FIN 579 Applied Portfolio Management

Fall 2

FIN 522 Cases in Financial Strategy (capstone class for specialization)
FIN 563 Investment banking
FIN 582 Project Management (required for practicum) (not in specialization)
FIN 583 Practicum (not in specialization)

Others within specialization: FIN 510 Big Data Analytics in Finance, FIN 518 Financial Modeling, FIN 564 Applied Financial Analysis, ACCY 502 Accounting Analysis II.

Other useful Courses: FIN 503 Quantitative Finance II (2 credit hours), FIN 512 Financial Derivatives

Provisional Study Plan for Quantitative Finance Track

Fall 1
FIN 501 Economics of Stock Market Fundamentals (required class)
FIN 511 Investments (required class)
FIN 512 Financial Derivatives (prerequisite class for specialization)
FIN 581 Professional Development (required class, 2 credit hours)

Others within specialization: FIN 503 Quantitative Finance II (2 credit hours), FIN 510 Big Data Analytics in Finance, FIN 528 Cases in Financial Derivatives, FIN 580 Advanced Data Science and Python for Finance (2 credit hours)

Other useful Courses: Core Courses

Spring
FIN 510 Big Data Analytics in Finance
FIN 513 Applications of Financial Engineering
FIN 515 Fixed Income portfolios
FIN 567 Financial Risk Management

Others within specialization: FIN 514 Valuation of Complex Derivative Securities (Capstone), FIN 580 Advanced Data Science and Python for Finance, FIN 580 Quantamental Investment

Other useful Courses: FIN 518 Financial Modeling, FIN 555 Financial Innovation, FIN 580: Financial Data Management and Analysis, STAT 542 Statistical Learning.

Fall 2
FIN 514 Valuation of Complex Derivative Securities (capstone class for specialization)
FIN 552 Applied Financial Econometrics
FIN 582 Project Management (required for practicum) (not in specialization)
FIN 583 Practicum (not in specialization)

Others within specialization: FIN 516 Term Structure Models, FIN 517 Advanced Term Structure Models, FIN 528 Cases in Financial Derivatives. FIN 553 Machine Learning, FIN 566 Algorithmic Market Microstructures, FIN 580 Options Trading and Market Making

Other useful Courses: FIN 518 Financial Modeling

Provisional Study Plan for Data Analytics & Fintech Track

Fall 1
FIN 501 Economics of Stock Market Fundamentals (required class)
FIN 503 Quantitative Finance II (2 credit hours) (prerequisite class for specialization)
FIN 511 Investments (required class)
FIN 581 Professional Development (required class, 2 credit hours)

Others within specialization: FIN 510 Big Data Analytics in Finance (Capstone), FIN 580 Advanced Data Science and Python for Finance (2 credit hours) (Prerequisite)

Other useful Courses: Core Courses, FIN 512 Financial Derivatives, FIN 521 Advanced Corporate Finance, STAT 542 Statistical Learning

Spring
FIN 510 Big Data Analytics in Finance (capstone class for specialization)
FIN 580 Advanced Data Science and Python for Finance (2 credit hours) (prerequisite class for specialization)

Others within specialization: FIN 555 Financial Innovation, FIN 567 Financial Risk Management, FIN 580 Quantamental Investment, FIN 580 Financial Data Management and Analysis

Other useful Courses: FIN 512 Financial Derivatives, FIN 513 Applications of Financial Engineering, FIN 514 Valuation of Complex Derivative Securities, FIN 515 Fixed Income portfolios, FIN 518 Financial Modeling, STAT 542 Statistical Learning.

Fall 2
FIN 552 Applied Financial Econometrics
FIN 553 Machine Learning in Finance
FIN 582 Project Management (required for practicum) (not in specialization)
FIN 583 Practicum (not in specialization)

Others within specialization: FIN 510 Big Data Analytics in Finance (Capstone)

Other useful Courses: FIN 514 Valuation of Complex Derivative Securities, FIN 521 Advanced Corporate Finance, FIN 566 Algorithmic Market Microstructures, STAT 542 Statistical Learning.

Provisional Study Plan for Finance Research (PhD Track)

Fall 1
FIN 501 Economics of Stock Market Fundamentals (required class)
FIN 511 Investments (required class)
FIN 580 Microeconomic Theory I

Others within specialization: None at this time.

Other useful Courses: FIN 503 Quantitative Finance II (2 credit hours), FIN 580 Advanced Data Science and Python for Finance (2 credit hours), Mathematics, Economics or Statistics Courses as required.

Spring
FIN 580 Financial Data Management and Analysis)

Others within specialization: None at this time.

Other useful Courses: FIN 512 Financial Derivatives, FIN 513 Applications of Financial Engineering, FIN 514 Valuation of Complex Derivative Securities, FIN 515 Fixed Income Portfolios, FIN 521 Advanced Corporate Finance, FIN 567 Financial Risk Management, FIN 510 Big Data Analytics in Finance; Mathematics, Economics or Statistics Courses as required.

Fall 2
FIN 552 Applied Financial Econometrics (required class for specialization) (Capstone)
FIN 591 Theory of Finance (prerequisite class for specialization)

Others within specialization: FIN 592 Empirical Analysis of Finance, FIN 594 Seminar in Corporate Finance

Other useful Courses: FIN 514 Valuation of Complex Derivative Securities, Mathematics, Economics or Statistics Courses as required.

Acknowledgement Form - CR/NC

The credit-no credit grading option is designed to encourage student exploration into areas of academic interest that they might otherwise avoid for fear of poor grades. All students considering this option are cautioned that many graduate and professional schools, and employers consider applicants whose transcripts bear a significant number of non-grade symbols less favorably than those whose transcripts contain none or very few. Likewise, in computing a grade-point average the NC symbol may be converted to a failing grade since it is not known whether the actual grade was a D or F.

All Students:

(1) Credit-no credit courses are not counted toward the grade-point average but are included as part of the total credit hours.

(2) Instructors are not informed of those students in their courses who are taking work under the credit-no credit option, and they report the usual letter grades at the end of the course. These grades are automatically converted to CR or NC.

(3) Grades of C- or better are required in order to earn credit.

(4) Final grades of CR or NC (for credit or no credit) are recorded on the student's permanent academic record and subsequently will not be changed to letter grades.

(5) Guided individual study course students may elect the credit-no credit option prior to completion of one-eighth of the lessons contained in the course; however, should they desire to return to a letter grade, an amended credit-no credit form must be filed prior to completion of one-half of the lessons.

(6) Courses taken under the credit-no credit option, including guided individual study courses, may be dropped only in accordance with the normal procedures for dropping courses.

Graduate Students:

(1) Graduate students may elect the credit-no credit option through the last day allowed for dropping a course without academic penalty. Students may elect to return to the regular grade basis by filing an amended request by the deadline date for dropping a course without academic penalty as indicated in the Graduate College calendar.

(2) The student's adviser must approve the election of this option in accordance with the policy established by the major department.

(3) Over the entire course of a degree program, a student must earn at least two credit hours of graded (A–D) course work for each hour of credit-no credit course work. In any one semester, a student may take no more than four credit hours on a credit-no credit basis. Hours transferred from another University cannot be used as part of the "graded course work."

(4) If a student is admitted on a limited basis, or if a student falls below the Graduate College minimum grade-point average of 3.00 and is placed on probation, he or she will not be allowed to register for credit-no credit course work for hours until the grade-point average has been raised to the minimum and the probation designation has been removed.

* * * * *

The Academic Director of the Masters of Science in Finance Program (MSF), Dr. Martin Widdicks, has met with me, a student of MSF, regarding the Credit/No Credit grading option. I have read the above policy on the CR/NC option and I am aware of the risks of taking the credit/no-credit option and that the responsibility to maintain a GPA of at least 3.0, a requirement for graduation, is entirely my responsibility.

_____   _____

Printed Name   Date

_____   _____

Signature   UIN

University Songs and Chants

- At many events both sporting and academic, or even anywhere around Champaign-Urbana you might hear the **"I-L-L I-N-I"** chant. This is a very simple chant where one group of people will shout out **"I-L-L"** to which anyone who hears it will shout back **"I-N-I"**.

- **"Hail to the Orange"** is the alma mater of the University of Illinois:

    Hail to the Orange, Hail to the Blue.
    Hail Alma Mater, Ever so true!
    We love no other, So let our motto be,
    Victory! Illinois Varsity!

    Here alma mater means the official song of the university and is slightly more formal than the chant above. The official songs are sung at sporting events and official university events such as commencements.

- The University of Illinois also has a fighting song called "Oskee wow-wow":

    Old Princeton yells her tiger
    Wisconsin her varsity
    And they give the same old Rah! Rah! Rah!
    At each University
    But the yell that always thrills me
    And fills my heart with joy
    Is the good old Oskee wow-wow
    That they yell at Illinois

    Oskee wow-wow Illinois
    Our eyes are all on you
    Oskee wow-wow Illinois
    Wave your Orange and your blue Rah! Rah!
    When the team trots out before you
    Ev'ry man stand up and yell
    Back the team and give [opponent's name]
    Oskee wow-wow Illinois

    Teddy Roosevelt may be famous
    and his name you often hear
    But it's heroes on the football field
    Each college man holds dear
    We think with pride of Roberts
    Artie Hall and Heavy too
    Oskee wow-wow for the wearers
    Of the Orange and the Blue.

    Fight songs are traditionally associated with sports teams and are also used by professional teams. At a University like Illinois they might be used to cheer on the sports teams.

Gies College of Business