



**UNIVERSITA' DEGLI STUDI DI MILANO**  
**PROGRAMME DESCRIPTION - ACADEMIC YEAR 2021/22**  
**IN**  
**FINANCE AND ECONOMICS (MEF) - Classe LM-16**  
**Enrolled from 2021/2022 academic year**

### **HEADING**

<b>Degree classification - Denomination and code:</b>	LM-16
<b>Degree title:</b>	Dottore Magistrale
<b>Curricula currently available:</b>	QUANTITATIVE FINANCE / QUANTITATIVE ECONOMICS
<b>Length of course:</b>	2 years
<b>Credits required for admission:</b>	180
<b>Total number of credits required to complete programme:</b>	120
<b>Course years currently available:</b>	1st
<b>Access procedures:</b>	open, subject to entry requirements
<b>Course code:</b>	B73

### **PERSONS/ROLES**

#### **Head of Study Programme**

Prof. Alberto Bucci

#### **Tutors - Faculty**

Prof. Alessandro Barbiero (Stage contact person)

Prof. Lorenzo Mercuri

#### **Degree Course website**

<https://mef.cdl.unimi.it>

#### **Degree Course E-mail**

Email: [mef@unimi.it](mailto:mef@unimi.it)

#### **Enrolment and Admission**

<http://www.unimi.it/studenti/matricole/77648.htm>

#### **Facebook**

<http://www.facebook.com/mefunimi>

#### **Further Degree Course Website**

<http://www.demm.unimi.it/corsi-di-laurea>

#### **Twitter**

@mefunimi

### **CHARACTERISTICS OF DEGREE PROGRAMME**

#### **Introduction**

With the Master degree in Finance and Economics (MEF), the University of Milan aims at offering an exclusive and high-quality study program. This internationally oriented master degree is thought to provide students with an excellent academic background, as well as with a promising outlook for a future professional career in today's challenging and dynamic national/international monetary/financial/real markets.

Due to the growing complexity of today's economies, expertise only in economics and finance or, conversely, only in quantitative methods is not enough to succeed in every day's challenges. The Master degree in MEF is organized: to provide theoretical and applied knowledge in both the economic mechanisms and the behaviour and history of financial markets, to build solid bases of quantitative and numerical methods, and to give insights into the process of economic/financial decision-making under uncertainty and/or in the presence of risk.

Indeed, recent and repeated financial crises have proven that mathematical thinking and economic theories cannot be considered separately from historical analyses and regulatory mechanisms.

Throughout the program, a well-balanced study track builds strong quantitative skills coupled with a solid knowledge base of the underlying theory of finance and economics. Students acquire the necessary knowledge and skills to use mathematical models able to comprehend and solve to comprehend complex financial and economic problems and learn how to apply these models in the fields of economic sciences and financial market analyses.

During the second year students of the master degree in MEF choose to specialize in one of the two fields of Quantitative Economics or Quantitative Finance. Working closely together with our outstanding faculty, students will benefit from its international scientific networks as well as its links with the industry-sector. Students may also attend seminars, laboratories and other activities organized yearly by the Department of Economics, Management and Quantitative Methods.

### **General and specific learning objectives**

Graduates of this master course will receive advanced training in quantitative methodologies and tools suitable to interpret and analyze economic and financial phenomena and will be able to operate directly on financial markets or in international economic institutions. The study program is designed to provide students with a solid background through the development of topics of economic theory, analysis of financial markets and the theory of decision making under risk and uncertainty. It includes study of financial markets from both the point of view of international law, history and economics.

The first year courses, common to both curricula, also provide capabilities in statistics, mathematics and computational techniques for the analysis of financial data and economic time series.

The second year of the master program is organized in two curricula. The first, Quantitative Economics, is dedicated to the training of professional economists capable of operating at national/international, public/private institutions (including the academia) or at the level of central government in both the financial and economic spheres.

The second curriculum, named Quantitative Finance, is aimed at preparing financial specialists capable of operating in the areas of pricing of derivatives, portfolio management, risk management and control in the financial sector intended in a broad sense.

### **Expected learning outcomes**

In the spirit of armonization of education within the European Union, the graduates of this the master program in Finance and Economics are expected to attend the following standards according to the so called Dublin Descriptors:

#### **A. Knowledge and understanding**

Graduates are expected to gain theoretical knowledge and advanced skills on the following areas: economics, mathematics and statistics, corporate and financial law.

For the economic area, topics offered include: monetary and financial economics, advanced micro and macroeconomics, growth and labour-market theories, the theory of investment-decisions (also under uncertainty) in economics and finance. The theories and analytical tools learnt from economics will enable students to understand the processes of economic globalization and growth, as well as the functioning of markets, the role of multinational corporations and financial institutions.

For the area of mathematics and statistics, the topics include: mathematical and statistical analysis, econometrics, mathematical finance, risk theory, portfolio optimization and optimal control. The students are expected to learn how to perform quantitative analyses for business and economics decision making, management of investments and financial forecasting of macroeconomic scenarios.

For the business and financial area, topics include: corporate finance, business management, economics of markets and financial intermediaries. The knowledge and skills acquired in this area will enable graduates to understand the policies of enterprise management, the strategies of internationalization of firms, the principles of corporate finance, the functioning of the financial system, the investment decisions and the policies for financial risk management.

For the law area the main focus will be on international financial and economic law. The lectures will provide legal expertise to understand the laws that rule the markets, the financial institutions and international trade.

#### **B. Applying knowledge and understanding**

Graduates will be able to apply the knowledge and skills acquired to the analysis and management of business tasks posed by the process of economic and financial globalization, to the design and implementation of internationalization strategies of firms, to the assessment of the financial risk, to the identification of the best economic policies to be implemented in the context of open economies (market regulation, competition policies, supervision of financial institutions, etc.); to the mathematical evaluation of investments; to the analysis and forecasting of economic and financial scenarios.

#### **C. Making judgements**

Graduates will gain the ability to make judgments about : the effects and effectiveness of the decisions of firms and financial institutions in which they were to operate, even in relation to the ethical implications of these decisions; the consequences and the effectiveness of economic policies. They will also need to assimilate fully the principles of professional ethics that guide interpersonal relationships in the contexts of employment. They should also learn the fundamental principles of the

scientific approach to problem solving in economics and business administration. Learning these principles will turn to be extremely useful in trying to solve those problems that they will face during their professional activity. The multidisciplinary approach of this programme encourages the development of independent judgment and critical thinking by offering students the opportunity to compare methodological approaches in different disciplines. The significant relevance of quantitative methods and their applications to economics and finance, facilitates the comprehension of the scientific approach to problem solving.

#### D. Communication skills

Graduates will be able to: present and communicate effectively within the company the results of their work (projects, reports, analyses, etc.); build cooperative relationships and collaborative working activities within groups; suggest solutions to the problems of faced within the working contexts using mathematical and quantitative tools; access to a more specialized audience, for example, through the publication of research results. The ability to communicate effectively in the workplace is primarily gained through the presentation and discussion of case studies. The drafting of reports and essays, as required by some of the courses, and the writing of the final dissertation will help to enhance written communication skills.

#### E. Learning skills

Graduates will have the ability to develop and increase their skills through the consultation of the published scientific literature and the use of databases and other information-sets. The master degree in Finance and Economics also provides the methodological skills that support capabilities for further learning up to the possibility to continue their studies in doctoral programs.

The students have also the opportunity to attend other activities organized by the Department of Economics, Management and Quantitative Methods such as seminars and workshops to improve their ability to understand scientific challenges and new topics of research.

The preparation of the final dissertation provides students with further opportunities to develop the skills of independent learning.

### **Professional profile and employment opportunities**

The master course in Finance and Economics aims at forming the following professional profiles.

Profile: Consultant and financial adviser.

Functions: the professionals included in this category make suggestions for investment and give technical advice to managers on whom they depend functionally; assist the management of financial investments through the economic and financial analysis of market data; propose predictive models of economics, financial times series and provide guidance for the calibration of theoretical models using market data.

Skills: baggage of theoretical knowledge and operational tools aimed at evaluating financial Investments as well as financial and credit risks.

Career opportunities: They operate in the office of financial management of banks, investment firms, investment funds, commercial and investment banks, financial intermediaries, for research and financial statement purposes. They also work as private consultants.

Profile: Operator and analyst of financial markets.

Functions: the figures included in this category act directly on behalf of their company in the financial markets or as brokerage agents, also assist the company in the interaction with the regulatory authorities in the markets thanks to a thorough knowledge of the rules that govern them.

Skills: baggage of theoretical knowledge and legal advise for the management of financial investments, the execution and management of contracts; ability to operate on traditional and digital markets.

Career opportunities: They operate in the office of financial management of banks, investment firms, investment funds, commercial and investment banks, financial intermediaries, for research and financial statement purposes.

Profile: Academic researcher, or researcher in research-departments within economic and financial institutions, both national and international.

Functions: the occupations included in this category exercise active research-functions of high responsibility in the fields of finance and economics within institutions and firms (both private and public, national and international).

Skills: baggage of theoretical knowledge in the economic-legal-financial fields aimed at doing active research (both theoretical and applied) in economic institutions and private companies, or else in banking and financial institutions operating in national and international contexts.

Career opportunities: They operate in universities, research-centers, research-departments of public/private firms, research departments of banks and similar institutions, or research-departments of international and governmental institutions.

Profile: Operators in the management and implementation of programs and projects of international development.

Functions: the occupations included in this category contribute to the formulation, management, monitoring, reporting of programs and projects of economic development as well as business development (i.e., business market expansion within the international arena).

Skills: baggage of theoretical and operational knowledge in the fields of managerial development and economic development/growth; strategic management of international and multinational firms; legal and administrative regulation of

markets; analysis of the processes of economic globalization, and the economic policies that govern such processes.

Career opportunities: They operate in companies (private or public companies of industry, trade, business services, banks and similar institutions) strongly oriented to internationalization and market-expansion (multinational firms), and in international and governmental institutions oriented to economic development

### **Pre-requisites for admission**

To attend the Master program in Economics and Finance it is necessary to demonstrate to have strong knowledge of mathematics, economics and statistics at the undergraduate level.

Students with an Italian degree (ex. DM 270 /04) of the following classes:

- l-7 Ingegneria civile e ambientale
- l-8 Ingegneria dell'informazione
- l-9 Ingegneria industriale
- l-16 Scienze dell'amministrazione e dell'organizzazione
- l-18 Scienze dell'economia e della gestione aziendale
- l-20 Scienze della comunicazione
- l-30 Scienze e tecnologie fisiche
- l-31 Scienze e tecnologie informatiche
- l-32 Scienze e tecnologie per l'ambiente e la natura
- l-33 Scienze economiche
- l-35 Scienze matematiche
- l-36 Scienze politiche e delle relazioni internazionali
- l-37 Scienze sociali per la cooperazione, lo sviluppo e la pace
- l-41 Statistica

and students with an Italian degree (ex DM 509/99) in the classes equivalent to those listed above can apply.

Candidates can also enroll to the programme from undergraduate classes other than those listed above after positive evaluation of the Collegio Didattico or its delegates (an Admission Committee or the President of the Collegio Didattico) if they substantively satisfy the access requirements.

Candidates lacking of one or more of the following minimum entry requirements: will not be assessed by the Admission Committee:

- a) at least 6 ECTS in the area of mathematics (MAT/01 MAT/09, SECS-S/06).
- b ) at least 6 ECTS in the statistical area (SECS-S/01 SECS-S/05, SECS- P05): a statistics course or a basic econometrics one.
- c) at least 12 ECTS in the economic area (SECS-P/01 SECS-P/03, SECS-P/06): at least one course of Microeconomics and at least one course of Macroeconomics.
- d) evidence of computer skills (ECDL) or 3 ECTS in Computer Science (INF/01, ING-INF/05) or equivalent diploma.

As for the English language knowledge, a level C1 or higher (according to CEFR) properly certified (preferably through the TOEFL-test) is required. In the absence of any certification the Admission Committee reserves the right to not admit the candidate to the programme.

Each applicant will have to submit, together with the application, a detailed curriculum vitae. Failing to provide this document implies that the applicant will be excluded from the selection.

Students with foreign qualification are expected to meet the substantive requirements equivalent to the minimum requirements for students with Italian title. Such checking of the pre-requisites will be conducted by an Admission Committee appointed by the Faculty Board - Collegio Didattico.

Applicants who meet the minimum entry requirements (irrespective of their nationality) are assessed by the Admission Committee according to the following criteria grid:

Criterion: Academic curriculum

Description: length (i.e., number of years taken) and quality (i.e., average grade in the overall number of exams taken) of the undergraduate degree as well as the final graduation mark

Maximum score: 80

Criterion: Choice coherence

Description: coherence between the previous academic curriculum/professional experience (if any) and the learning objectives of the master's degree in Finance and Economics

Maximum score: 20

Applicants who obtain a score equal or less than 70 points are not admitted.

Applicants who obtain a score above 70 points but less than 80 points will be invited to an oral interview, held in English language and exclusively done via electronic devices (e.g.: via skype). The interview is aimed at examining in more depth the applicants background knowledge and motivation.

Applicants who obtain a score greater or equal to 80 points and satisfy the English knowledge requirements can be subject to further interview before admission.

Applicants not submitting any English knowledge certification (preferably the TOEFL-test) will be excluded even if they exceed the 80 points-threshold.

### **Programme structure**

The master degree in Finance and Economics is a genuinely multidisciplinary programme, presenting a balanced offer of courses in economics and finance supported by several quantitative courses.

Students must earn 120 ECTS to complete programme requirements.

### **Campus**

Faculty of Political, Economic and Social Sciences - Via Conservatorio, 7 - 20122 MILANO

### **Compulsory attendance**

No obligation

### **Study plan definition and submission for approval**

Students may choose a complete study plan starting from the first year.

### **Degree programme final exam**

The final exam consists in the submission and public defence, in front of a committee, of a master's dissertation.

The master's dissertation is an original piece of work, written by the candidate under the guidance of a supervisor.

For the preparation of the final Master thesis, the students will earn 21 ECTS which includes a mandatory stage equivalent to 3 ECTS (no additional credits earned).

### **Criteria for admission to degree course final exam**

Having earned at least 99 credits for the learning activities contemplated by his/her study plan, a student may be admitted to undertake the final exam leading to the award of the master's degree.

A total of 21 credits are reserved to the design, preparation and writing up of the master's dissertation, including the mandatory stage of 3 credits.

The formal assignment of these credits can only take place at the moment when the stage is completed, the dissertation is defended and the final exam is passed.

## ***EXPERIENCE OF STUDY ABROAD AS PART OF THE DEGREE PROGRAM***

The University of Milan supports international mobility by providing its students with the opportunity to spend study and internship periods abroad. It is a unique chance to enrich your educational path in a new exciting environment.

The agreements entered into by the University with over 300 universities from the 27 EU member countries and other Extra-EU countries under the European Erasmus+ programme allow regularly enrolled students to carry out part of their studies at one of the partner universities or to undertake internships at companies, training and research centres and other organizations.

Similar international mobility opportunities are provided outside Europe, through agreements with a number of prestigious institutions.

### **Study and internships abroad**

One of the most effective policies adopted by European Union in the last years has been the internationalization of higher education. The various Erasmus programmes that have been implemented since the nineties have greatly increased the mobility of European students.

Being a brand-new programme with an internationally oriented educational core strategy, MEF promotes a wide internationalization of their students, and therefore strongly encourages them to spend part of their studies abroad in Erasmus+ Programmes.

Erasmus+ provides opportunities to study, train, gain work experience and skills. Students can go abroad from 3 up to 12 months (including a complementary traineeship period, if planned), and may receive additional grants for studying or training. At the end of their foreign stay, students get full recognition of completed activities in terms of credits for their degree. Student mobility is carried out in the framework of prior "inter-institutional agreements" between the sending and receiving institutions.

Students can also join the traineeship programme (Placement), by going abroad from 2 up to 12 months, starting their traineeship from the first year of study. For a traineeship which is an integral part of the curriculum, the sending institution must give full academic recognition for the period spent abroad. For a traineeship that is not part of the curriculum of the student, the sending institution shall provide recognition at least by recording this period in the Diploma Supplement or, in the case of recent graduates, by providing a traineeship certificate. Traineeship may also be established with private and

public companies, educational or research centers other than the hosting institution, especially in the field of finance. MEF academic staff has strong relations with some important European universities, in particular in Germany, France and Poland but also outside the EU, and is actively involved in research and education networks, so that students' activity abroad (including the development of the final dissertation) can be successfully supervised. Short exchange programs are in place with the HSBC Business School - Peking University Shenzhen (China), Plekhanov Russian University of Economics (Moscow, Russian Federation).

### **How to participate in Erasmus mobility programs**

The public selection generally begins around February each year with the publication of a call for applications specifying the destinations, with the respective programme duration (from 2/3 to 12 months), requirements and online application deadline.

Every year, before the deadline for the call, the University organizes informative meetings to illustrate opportunities and rules for participation to students.

#### Erasmus+ scholarship

The European Union grants the winners of the Erasmus+ programme selection a scholarship to contribute to their mobility costs, which is supplemented by the University funding for disadvantaged students.

#### Language courses

Students who pass the selections for mobility programmes can benefit from intensive foreign language courses offered each year by the University.

Learn more at <https://www.unimi.it/en/international/study-abroad/studying-abroad-erasmus>

For assistance, please contact:

International Mobility Office

Via Santa Sofia 9 (second floor)

Tel. 02 503 13501-12589-13495-13502

Contacts: InformaStudenti [mobility.out@unimi.it](mailto:mobility.out@unimi.it)

Student Desk booking through InformaStudenti

## **ADMISSION CRITERIA: 1ST YEAR OPEN, SUBJECT TO ENTRY REQUIREMENTS**

### **Links to enrolment information and procedures**

<https://www.unimi.it/en/study/enrolment>

### **Practical instructions**

Applicants, both foreign and Italian, holding a bachelor's degree or expecting to obtain it by December 31st, 2021, must apply for admission to the MEF programme from March 12th, 2021 June 30th, 2021.

Non EU Applicants from outside Italy holding a non-Italian bachelor's degree or expecting to obtain it by December 31st, 2021, must submit a pre-application at the Italian Embassy of their own country before May 31st 2021 (this date may be subject to change according to Italian Ministry of Foreign Affairs).

For more specific information about the selection criteria, please check the 'prerequisites for admission' section of this document.

For an idea of the appropriate level of knowledge, competences, and skills, candidates may consult the following textbooks:

#### Mathematics

Topics: Calculus, Linear Algebra.

Suggested reference:

- Sydsæter, K., Hammond, P. (2008) Essential Mathematics for Economic Analysis, (3 edition), Pearson. Chap: 1-10 (Calculus I), 15-16 (Vector and Matrices)
- Simon, C.P., Blume, L. (2010) Mathematics for Economists, W. W. Norton & Company

#### Economics

Topics: Principles of micro and macro economics.

Suggested references (both):

- Blanchard O. (2010) Macroeconomics, 5th edition, Pearson Prentice-Hall, Upper Saddle River, N.J., 2010.
- Varian H. (2009) Intermediate Microeconomics. A Modern Approach, 8th edition, Norton, New York, N.Y.

#### Statistics

Topics: elementary probability and random variables, descriptive statistics, statistical inference.

Suggested references (any of those):

- Ross S. (2010) Introductory Statistics, 3d Edition, Elsevier.
- Trosset M.W. (2008) An introduction to statistical inference and its applications with R, Chapman & Hall/CRC.
- Moore D., McCabe G.P., Craig B. (2012) An Introduction to the Practice of Statistics, 7th edition, W.H. Freeman &

Company.

Econometrics

Topics: Linear regression model with one or more regressors: estimation and testing, Instrumental Variables.

Suggested reference:

- Stock J., Watson M. (2010) Introduction to Econometrics, 3rd Edition, Addison-Wesley.

Further detailed information concerning the MEF programme and the admission procedures are available at: <https://mef.cdl.unimi.it/en/enrolment>, or can be asked to the programme secretariat, [mef@unimi.it](mailto:mef@unimi.it), tel. +39 02 503-21553.

**N° of places reserved to non-EU students resident abroad**

30

### **ADMISSION CRITERIA: 2°YEAR**

#### **Notes**

Also candidates who wish to enroll in the second year of MEF need to submit their application and satisfy the entry requirements described above.

<b>1st COURSE YEAR Core/compulsory courses/activities common to all curricula</b>		
<b>Learning activity</b>	<b>Ects</b>	<b>Sector</b>
Advanced Microeconomics and Macroeconomics	12	SECS-P/01
Data Mining and Computational Statistics	9	SECS-S/01
Financial Investments: Module I, Portfolio Theory; Module II, Portfolio Management	12	(6) SECS-P/09, (6) SECS-P/11
International Economic Law	6	IUS/13
Mathematical Methods for Finance	9	SECS-S/06
Statistical Methods for Finance	6	SECS-S/01
Time Series Analysis	6	SECS-P/05
	Total number of compulsory credits/ects	60
<b>2nd COURSE YEAR (available as of academic year 2022/23) Core/compulsory courses/activities common to all curricula</b>		
<b>Learning activity</b>	<b>Ects</b>	<b>Sector</b>
Financial Economics	6	(3) SECS-P/02, (3) SECS-P/01
Financial Markets and Financial Crises: A Historical Approach	6	SECS-P/12
	Total number of compulsory credits/ects	12
<b>Further elective courses common to all curricula</b>		
<b>Students must earn 9 credits for elective activities.</b>		
<b>Students must earn 3 credits by selecting an Internship/Stage.</b>		
<b>End of course requirements common to all curricula</b>		
Final Exam	18	NA
	Total number of compulsory credits/ects	18

### **LIST OF CURRENTLY AVAILABLE CURRICULA**

QUANTITATIVE FINANCE Course years currently available: 1st

QUANTITATIVE ECONOMICS Course years currently available: 1st

#### **CURRICULUM: [B73-B] QUANTITATIVE FINANCE**

<b>2nd COURSE YEAR (available as of academic year 2022/23) Core/compulsory courses/activities Curriculum-specific features QUANTITATIVE FINANCE</b>		
<b>Learning activity</b>	<b>Ects</b>	<b>Sector</b>
Numerical Methods for Finance and Portfolio Optimization	12	(6) SECS-S/01, (6) SECS-S/06
Risk Management	6	SECS-S/06
	Total number of compulsory credits/ects	18

#### **CURRICULUM: [B73-C] QUANTITATIVE ECONOMICS**

<b>2nd COURSE YEAR (available as of academic year 2022/23) Core/compulsory courses/activities Curriculum-specific features QUANTITATIVE ECONOMICS</b>		
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<b>Learning activity</b>	<b>Ects</b>	<b>Sector</b>
Dynamic Macroeconomics (Module I: Growth Theory + Module II: Investment and Labour Markets Theory)	12	SECS-P/01
Microeconometrics	6	(3) SECS-P/05, (3) SECS-P/01
	Total number of compulsory credits/ects	18

## ***COURSE PROGRESSION REQUIREMENTS***

None