



```
ther = async () => {  
  let apiCall = fetch(`${a  
  res => res.json()  
  res => {  
    console.log(res);  
    let city = res.name;  
    let country = res.sys.co  
    let weatherDescription =  
    let currentTemp = res.ma  
    let maxTemp = res.main.1  
    let minTemp = res.main.1  
    I  
    console.log(weatherDesc  
    console.log(currentTemp)  
    console.log(maxTemp);  
    console.log(minTemp);  
    this.setState({  
      city: city,  
      country:  
    });  
  }  
}
```

$$f(h_i) l_i \frac{1}{\sqrt{2\pi}}$$
$$\sum_{k=-\infty}^{\infty} \ln(\cos)$$
$$\int_0^k \frac{p(x)}{bq(x)} dx'$$

STUDENT HANDBOOK

DEPARTMENT OF MATHEMATICS



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1. Preface

The purpose of this handbook is to assemble information in one location document for the convenience of undergraduate students in Applied Mathematics - Financial Engineering & Risk Management (FERM), at International University (HCMIU), Vietnam National University Ho Chi Minh City.

This document is not comprehensive, nor does the information contained herein supersede or have priority over that contained in the IU Bulletin (obtained from www.hcmiu.edu.vn). The Department of Mathematics (DM) also reserves the right of further interpretation and modification of the information herein on an ongoing basis. This handbook is a dynamic document, which will be updated periodically. Students and supervisors are therefore encouraged to obtain the most recent version. Suggested additions or corrections are welcomed and should be addressed to the DM in Room A2-610.

FERM student materials can be found at the website:

www.math.hcmiu.edu.vn

General HCMIU student resources can be found at:

www.hcmiu.edu.vn

Other information and support for undergraduate students are available from:

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International University, Vietnam National University Ho Chi Minh City,
Quarter 6, Linh Trung Ward, Thu Duc District, Ho Chi Minh City,
Tel: (84-8)3724 4270 (ext: 3235) Fax: (84-4)3724 4271
Email: Dr. Nguyen Minh Quan, Vice-Chair, quannm@hcmiu.edu.vn*

2. Introduction

2.1. International University

a. Overview

The International University (IU) is the first public International University in Vietnam and a member of Vietnam National University – Ho Chi Minh City (VNU). The IU is striving to become a prestigious research institution and to train high quality human resources for the country. It is fully empowered to award degrees at all levels from undergraduate to postgraduate. Its international character is reflected in the international academic environment of IU as a whole, including all degree programs, the teaching staff, the language of instruction, and the academic and research infrastructure. Its public nature is reflected in the long-term support from the government and other funding agencies and organizations at all levels – from local and national to regional and international.

b. Schools and Departments

- School of Biotechnology
- School of Business
- School of Computer Science and Engineering
- School of Electrical Engineering
- School of Biomedical Engineering
- School of Industrial Engineering and Management
- Department of Civil Engineering
- Department of Environmental Engineering
- Department of Mathematics
- Department of Physics
- Department of English

2.2. Department of Mathematics

The Department of Mathematics of International University was founded in 2006 with the mission of becoming one of the best research centers in Pure and Applied Mathematics, both nationally and internationally. The main duty of the Department is to teach all Math related courses in IU and produce high-quality research. The department's vision and mission are consistent with the vision and mission of International University, Vietnam National University – HCMC.

a. Mission and Vision

- Vision:
Take a leadership role in education and research in Pure and Applied Mathematics in Vietnam.
- Mission:
 - *Offer high-quality graduate and undergraduate education in Applied Mathematics.*
 - *Perform excellent research including basic and applied research in Pure and Applied Mathematics to meet the needs of industry and society.*
 - *Take the pioneering role in developing the field of Financial Engineering & Risk Management (and other fields of Applied Mathematics) in Vietnam by promoting the application of Financial Engineering & Risk Management in a variety of production and service sectors in Vietnam.*

b. Faculty

Chair
<p>Prof. Dr. Pham Huu Anh Ngoc</p> <p>Ph.D. Institute of Mathematics, Hanoi-Vietnam, 2000. KOSEF Postdoctoral fellow, Busan, Korea, 2004-2005. JSPS Postdoctoral fellow, Tokyo, Japan, 2005-2007. Alexander von Humboldt experienced researcher, Ilmenau, Germany, 2007-2009.</p> <p>Email: phangoc@hcmiu.edu.vn</p>
Vice-Chair
<p>Dr. Nguyen Minh Quan</p>

Ph.D. State University of New York at Buffalo, USA, 2011.
Visiting scientist, Institute of Mathematics, École Polytechnique
Fédérale de Lausanne (EPFL), Switzerland, 2018.
Email: quannm@hcmiu.edu.vn

Lecturers

Prof. DrSc. Nguyen Dinh

Ph.D. Hanoi Institute of Mathematics, 1994 HDR (Habilitation a Diriger
des Recherches) University of Limoges, France, 2010.
Email: ndinh@hcmiu.edu.vn

Assoc. Prof. Mai Duc Thanh

Ph.D. École Polytechnique de Paris France, 2003
Postdoctoral fellow, Institute of Applied Mathematics, University of
Freiburg, Germany, 2003-2004.
Email: mdthanh@hcmiu.edu.vn

Assoc. Prof. Dr. Nguyen Ngoc Hai

Ph.D. Hanoi Institute of Mathematics, 1994
ICTP Postdoctoral fellow, Italia, 2002.
Email: nnhai@hcmiu.edu.vn

Dr. Janet Harris

Ph.D. Oxford University, UK, 1998.
JSPS Postdoctoral fellow, Tokyo, Japan, 1998-2000.
Email: janet@hcmiu.edu.vn

<p style="text-align: center;">Dr. Pham Hai Ha</p> <p>Ph.D. University of Pau et des pays de l'Adour, 2013, France Email: phha@hcmiu.edu.vn</p>
<p style="text-align: center;">Dr. Ta Quoc Bao</p> <p>Ph.D. Åbo Akademi University, Finland, 2014 Email: baotq@hcmiu.edu.vn</p>
<p style="text-align: center;">Dr. Nguyen Anh Tu</p> <p>Bachelor Australian National University, Canberra, Australia, 2001. Ph.D. University of Chicago, Chicago, IL, USA, 2008. Email: natu@hcmiu.edu.vn</p>
<p style="text-align: center;">MSc. Kha Kim Bao Han</p> <p>BSc in Financial Engineering and Risk Management. International University, Vietnam National University-HCMC (2014-2018) MSc in Applied Mathematics, Université de Tours, France (2018-2019). Email: kkbhan@hcmiu.edu.vn</p>
Secretary
<p style="text-align: center;">MSc. Bui Thi Huong</p> <p>Email: bthuong@hcmiu.edu.vn</p>
Teaching Assistant
Nguyen Thanh Khang

Email: ntkhang@hcmiu.edu.vn

Mai Thi Quyen

Email: mtquyen@hcmiu.edu.vn

c. Research and Projects

Regarding scientific research, the Department of Mathematics has always been in the leading place in the university and within the whole of VNU-HCM. For many consecutive years 2012-2018, the Department of Mathematics has received the "Excellent scientific publications" award from the President of VNU-HCM, and many faculty members also received awards for "Individual with excellent scientific publications".

- Faculty members' research publications, projects, and awards:

Academic year	International publications (ISI papers)	Projects with grants	Awards for Individuals of outstanding performance and achievements in scientific research	Award for Excellent Research Unit of the Vietnam National University-HCMC
2015-2016	22	7	1	x
2016-2017	24	8	1	x
2017-2018	21	6	2	x
2018-2019	18	7	1	x
2019-2020	18	7		

- From 2013 until now, the students and academic clubs of the Department of Mathematics have achieved the following:

- 15 full MSc Scholarships and 3 full PhD Scholarships.
- 6 prizes in Vietnam Student Olympiad in Mathematics Contests (2 First Prizes: DTTri, GTK Hung, 2 Second Prizes: DT Tri, NHQ Khai, 02 Third Prizes: DT Tri, ND Anh).
- 11 prizes in Vietnam Econometrics Olympic and Applied Methods (4 First Prizes, 1 Second Prize, 2 Third Prize, 4 Consolation Prizes).
- 1 First Prize (Gold level) in the 2019 World Quant challenge (NHQ Khai).
- 2 student research articles (1 conference proceedings paper and 1 ISI paper).
- 1 Second prize in CFA research challenge.

d. Career Opportunities

After graduation, many have continued to study at a higher level such as a Master or Ph.D. degree, with the best assistance of the DM such as reference letters.

The others have entered jobs in the following fields:

- Banking
- Securities markets
- Actuary
- Financial Engineering
- Investment Funds
- Risk management
- Quantitative finance
- Machine learning ...

3. Program

3.1. Overview

Since 2013, the Department of Mathematics has conducted a bachelor's degree program in Financial Engineering and Risk Management. The Financial Engineering and Risk Management program is designed to equip students with basic and up-to-date knowledge of Mathematics, Informatics, and Financial Engineering, to help them implement the processes of analyzing, forecasting and managing financial issues and related issues, solving real situations in the fields of Economics and Finance.

3.2. Objectives

Graduates from the Applied Mathematics (FERM) program will be expected to:

- (PO1) Effectively apply their knowledge and skills as financial engineers within the industry as well as the state agencies dealing with the analysis and design of modern financial products and processes.
- (PO2) Work and communicate effectively with others on multi-disciplinary teams to develop practical, technically-sound, cost-effective solutions to complex financial problems.
- (PO3) Maintain an active program of lifelong learning, self-updating, and continuing education while practicing financial engineering in an ethical and professionally responsible manner.
- (PO4) Understand professional, ethical, legal, security, and social issues and responsibilities. Seek leadership roles as practitioners and become active members within professional and technical societies.

3.3. Learning Outcomes

Upon graduation, our students should be able to:

- a) Apply their mathematics, computing, and finance knowledge appropriately in their discipline:
 - Build a mathematical model using stochastic analysis and differential equations
 - Code computer programs to simulate solutions
 - Apply financial knowledge to interpret solutions
- b) Identify, analyze, and solve financial and risk management problems, specifying and defining the computing and engineering requirements

- c) Conduct experiments on constructed solutions, as well as analyze and interpret data and results
- d) Design, implement, and evaluate a financial product or risk management strategy to meet desired needs and constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- e) Function effectively on a multidisciplinary team to accomplish a common goal
- f) Understand professional, ethical, legal, security and social issues and responsibilities
- g) Communicate effectively with a broad range of audiences
- h) Recognize the need for and continue their professional development and lifelong learning
- i) Update their knowledge of contemporary issues
- j) Have the broad education necessary to understand the impact of engineering solutions in global, economic, environmental, and societal contexts

3.4. Curriculum Structure

Knowledge blocks	Number of courses	Number of Credits	Percentage
General	18	50	33.6 %
Core	14	48	32.2 %
Major	12	36	24.2 %
Internship & Thesis	2	15	10.0 %

3.5. Course List (updated in 2021)

ACADEMIC ENGLISH (TOEFL iBT \geq 61; IELTS \geq 5.5)

Freshman Year

<i>Semester 1</i>			<i>Semester 2</i>		
EN007IU	Writing AE1	2	EN011IU	Writing AE2	2
EN008IU	Listening AE1	2	EN012IU	Speaking AE2	2
MAFE101IU	Analysis 1	4	MAFE103IU	Analysis 2	4
PE008IU	Critical Thinking	3	MAFE104IU	Linear Algebra	4
BA117IU	Micro Economics	3	MAFE105IU	Financial Economics	3
MAFE109IU	Introduction to Python	4	BA119IU	Marco Economics	3
PT001IU	Physical Training 1	3	PT002IU	Physical Training 2	3
<i>Total Credits</i>		21	<i>Total Credits</i>		21

Sophomore Year					
<i>Semester 3</i>			<i>Semester 4</i>		
MAFE201IU	Real Analysis	4	MAFE206IU	Probability	3
MAFE203IU	Analysis 3	3	MAFE202IU	Differential Equations	4
MAFE212IU	Financial Accounting	4	MAFE315IU	Introduction to Corporate Finance	3
MAFE204IU	Database Management system	3	MAFE208IU	Numerical Analysis	4
	FERM Elective #1	3	MAFE215IU	Financial Management	3
PE015IU	Philosophy of Marxism and Leninism	3	PE016IU	Political economics of Marxism and Leninism	2
<i>Total Credits</i>		20	<i>Total Credits</i>		19
<i>Summer Semester 2: Military Education</i>					
Junior Year					
<i>Semester 5</i>			<i>Semester 6</i>		
MAFE316IU	Statistics	4	MAFE306IU	Financial Mathematics 1	3
MAFE302IU	Random Processes	3	MAFE307IU	Optimization 2	3
MAFE303IU	Optimization 1	4	MAFE308IU	Financial Risk Management 1	3

MAFE309IU	Software Engineering	3	MAFE207IU	Decision Making	3
	FERM Elective #2	3	MAFE314IU	Financial econometrics	3
PE017IU	Scientific socialism	2	PE018IU	History of Vietnamese Communist Party	2
			PE019IU	Ho Chi Minh's Thoughts	2
	Total Credits	19		Total Credits	19
Summer Semester 3					
	MAFE313IU-Summer Internship	3			
	Total Credits	3			
Senior Year					
Semester 7			Semester 8		
MAFE401IU	Financial Mathematics 2	3	MAFE409IU	GRADUATION THESIS	12
MAFE402IU	Portfolio Management	3			
MAFE403IU	Research Methods in Finance	3			
	FERM Elective #3	3			
	FERM Elective #4	3			
	Total credit	15		Total Credits	12

Total credits: 149

INTENSIVE ENGLISH 2 (TOEFL iBT 46-60, IELTS <=5.0)

Freshman Year					
Semester 1			Semester 2		
ENTP02	IE2	13	EN007IU	Writing AE1	2
			EN008IU	Listening AE1	2
PT001IU	Physical Training 1	3	MAFE101IU	Analysis 1	4
PE015IU	Philosophy of Marxism and Leninism	3	MAFE104IU	Linear Algebra	4
PE016IU	Political economics of Marxism and Leninism	2	MAFE105IU	Financial Economics	3
			BA117IU	Micro Economics	3
			PE008IU	Critical Thinking	3
			PT002IU	Physical Training 2	3

<i>Total Credits</i>	21	<i>Total Credits</i>	24
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Sophomore Year					
<i>Semester 3</i>		<i>Semester 4</i>			
EN011IU	Writing AE2	2	MAFE201IU	Real Analysis	4
EN012IU	Speaking AE2	2			
MAFE103IU	Analysis 2	4	MAFE203IU	Analysis 3	3
BA119IU	Macro Economics	3	MAFE202IU	Differential Equations	4
MAFE109IU	Introduction to Python	4	MAFE315IU	Introduction to Corporate Finance	3
MAFE212IU	Financial Accounting	4	MAFE208IU	Numerical Analysis	4
PE017IU	Scientific socialism	2	MAFE215IU	Financial Management	3
				FERM Elective #1	3
<i>Total Credits</i>		21	<i>Total Credits</i>		24
<i>Summer Semester 2: Military Education</i>					
Junior Year					
<i>Semester 5</i>			<i>Semester 6</i>		
MAFE206IU	Probability	3	MAFE307IU	Optimization 2	3
MAFE303IU	Optimization 1	4	MAFE308IU	Financial Risk Management 1	3
MAFE204IU	Database Management system	3	MAFE207IU	Decision Making	3
MAFE309IU	Software Engineering	3	MAFE314IU	Financial econometrics	3
PE018IU	History of Vietnamese Communist Party	2	MAFE316IU	Statistics	4
PE019IU	Ho Chi Minh's Thoughts	2	MAFE302IU	Random Processes	3
	FERM Elective #2	3			
<i>Total Credits</i>		20	<i>Total Credits</i>		19
<i>Summer Semester 3</i>					
	MAFE313IU-Summer Internship	3			
<i>Total Credits</i>		3			
Senior Year					
<i>Semester 7</i>			<i>Semester 8</i>		

MAFE306IU	Financial Mathematics 1	3	MAFE409IU	GRADUATION THESIS	12
MAFE402IU	Portfolio Management	3	MAFE401IU	Financial Mathematics 2	3
MAFE403IU	Research Methods in Finance	3			
	FERM Elective #3	3			
	FERM Elective #4	3			
<i>Total credit</i>		15	<i>Total Credits</i>		15

Total credits: 162

Remark: If a student does not pass IE2 multiple times, he/she has to take the single course IE2 in next semesters until pass the level IE2. Trong trường hợp SV rớt IE2 nhiều lần, sinh viên phải học riêng môn IE2 ở các học kì tiếp theo cho đến khi đạt trình độ IE2.

INTENSIVE ENGLISH 1 (TOEFL iBT 35-45, IELTS <=4.5)

Freshman Year					
<i>Semester 1</i>			<i>Semester 2</i>		
ENTP01	IE1 (week: 1-7)	17	EN007IU	Writing AE1	2
			EN008IU	Listening AE1	2
ENTP02	IE2 (week: 8-14)	13	MAFE101IU	Analysis 1	4
			MAFE104IU	Linear Algebra	4
			MAFE105IU	Financial Economics	3
			BA117IU	Micro Economics	3
			PE008IU	Critical Thinking	3
			PT001IU	Physical Training 1	3
<i>Total Credits</i>		30	<i>Total Credits</i>		24
<i>Summer Semester 1</i>					
PE015IU	Philosophy of Marxism and Leninism	3			
PE016IU	Political economics of Marxism and Leninism	2			
<i>Total Credits</i>		5			

Sophomore Year					
<i>Semester 3</i>			<i>Semester 4</i>		
EN011IU	Writing AE2	2	MAFE201IU	Real Analysis	4
EN012IU	Speaking AE2	2			

MAFE1031 U	Analysis 2	4	MAFE203IU	Analysis 3	3
BA119IU	Macro Economics	3	MAFE202IU	Differential Equations	4
MAFE1091 U	Introduction to Python	4	MAFE315IU	Introduction to Corporate Finance	3
MAFE2121 U	Financial Accounting	4	MAFE208IU	Numerical Analysis	4
PT002IU	Physical Training 2	3	MAFE215IU	Financial Management	3
PE017IU	Scientific socialism	2		FERM Elective #1	3
<i>Total Credits</i>		24	<i>Total Credits</i>		24
Summer Semester 2: Military Education					
Junior Year					
Semester 5			Semester 6		
MAFE2041 U	Database Management system	3	MAFE307IU	Optimization 2	3
MAFE2061 U	Probability	3	MAFE308IU	Financial Risk Management 1	3
MAFE3031 U	Optimization 1	4	MAFE207IU	Decision Making	3
MAFE3091 U	Software Engineering	3	MAFE314IU	Financial econometrics	3
PE018IU	History of Vietnamese Communist Party	2	MAFE316IU	Statistics	4
PE019IU	Ho Chi Minh's Thoughts	2	MAFE302IU	Random Processes	3
	FERM Elective #2	3			
<i>Total Credits</i>		20	<i>Total Credits</i>		19
Summer Semester 3					
MAFE313IU- Summer Internship		3			
<i>Total Credits</i>		3			
Senior Year					
Semester 7			Semester 8		
MAFE3061 U	Financial Mathematics 1	3	MAFE409IU	GRADUATION THESIS	12
MAFE4021 U	Portfolio Management	3	MAFE401IU	Financial Mathematics 2	3
MAFE4031 U	Research Methods in Finance	3			
	FERM Elective #3	3			
	FERM Elective #4	3			
<i>Total credit</i>		15	<i>Total Credits</i>		15

Total credits: 179

Remark: If a student does not pass IE2 multiple times, he/she has to take the single course IE2 in next semesters until pass the level IE2. Trong trường hợp SV rớt IE2 nhiều lần, sinh viên phải học riêng môn IE2 ở các học kì tiếp theo cho đến khi đạt trình độ IE2.

INTENSIVE ENGLISH 0 (TOEFL iBT <=34, IELTS <=4.0)

Freshman Year					
<i>Semester 1</i>			<i>Semester 2</i>		
ENTP00	IE0 (week 1-7)	17	ENTP02	IE2	13
ENTP01	IE1 (week 8-14)	17	PT001IU	Physical Training 1	3
<i>Total Credits</i>		34	<i>Total Credits</i>		16
<i>Summer Semester 1</i>					
PE015IU	Philosophy of Marxism and Leninism	3			
EN007IU	Writing AE1	2			
EN008IU	Listening AE1	2			
MAFE101IU	Analysis 1	4			
<i>Total Credits</i>		11			
Sophomore Year					
<i>Semester 3</i>			<i>Semester 4</i>		
EN011IU	Writing AE2	2	MAFE201IU	Real Analysis	4
EN012IU	Speaking AE2	2	MAFE203IU	Analysis 3	3
MAFE103IU	Analysis 2	4	BA119IU	Macro Economics	3
MAFE104IU	Linear Algebra	4	MAFE105IU	Financial Economics	3
BA117IU	Micro Economics	3	MAFE202IU	Differential Equations	4
MAFE212IU	Financial Accounting	4	MAFE215IU	Financial Management	3
PE016IU	Political economics of Marxism and Leninism	2	PE017IU	Scientific socialism	2
	FERM Elective #1	3			
<i>Total Credits</i>		24	<i>Total Credits</i>		22
<i>Summer Semester 2: Military Education</i>					
Junior Year					

<i>Semester 5</i>			<i>Semester 6</i>		
MAFE204IU	Database Management system	3	MAFE208IU	Numerical Analysis	4
MAFE109IU	Introduction to Python	4	MAFE308IU	Financial Risk Management 1	3
MAFE206IU	Probability	3	MAFE316IU	Statistics	4
PE018IU	History of Vietnamese Communist Party	2	MAFE302IU	Random Processes	3
PE019IU	Ho Chi Minh's Thoughts	2	PE008IU	Critical Thinking	3
PT002IU	Physical Training 2	3			
	FERM Elective #2	3			
	<i>Total Credits</i>	20		<i>Total Credits</i>	17
<i>Summer Semester 3</i>					
	MAFE313IU- Summer Internship	3			
	<i>Total Credits</i>	3			
Senior Year					
<i>Semester 7</i>			<i>Semester 8</i>		
MAFE306IU	Financial Mathematics 1	3	MAFE207IU	Decision Making	3
MAFE314IU	Financial econometrics	3	MAFE401IU	Financial Mathematics 2	3
MAFE303IU	Optimization 1	4	MAFE402IU	Portfolio Management	3
MAFE309IU	Software Engineering	3	MAFE307IU	Optimization 2	3
	FERM Elective #3	3	MAFE315IU	Introduction to Corporate Finance	3
				FERM Elective #4	3
	<i>Total credit</i>	16		<i>Total Credits</i>	18

Semester 9 (5th-year)

MAFE403IU	Research Methods in Finance	3			
MAFE409IU	GRADUATION THESIS	12			
	<i>Total Credits</i>	15			

Total credits: 196

Remark: If a student does not pass IE2 multiple times, he/she has to take the single course IE2 in next semesters until pass the level IE2. Trong trường hợp SV rớt IE2 nhiều lần, sinh viên phải học riêng môn IE2 ở các học kì tiếp theo cho đến khi đạt trình độ IE2.

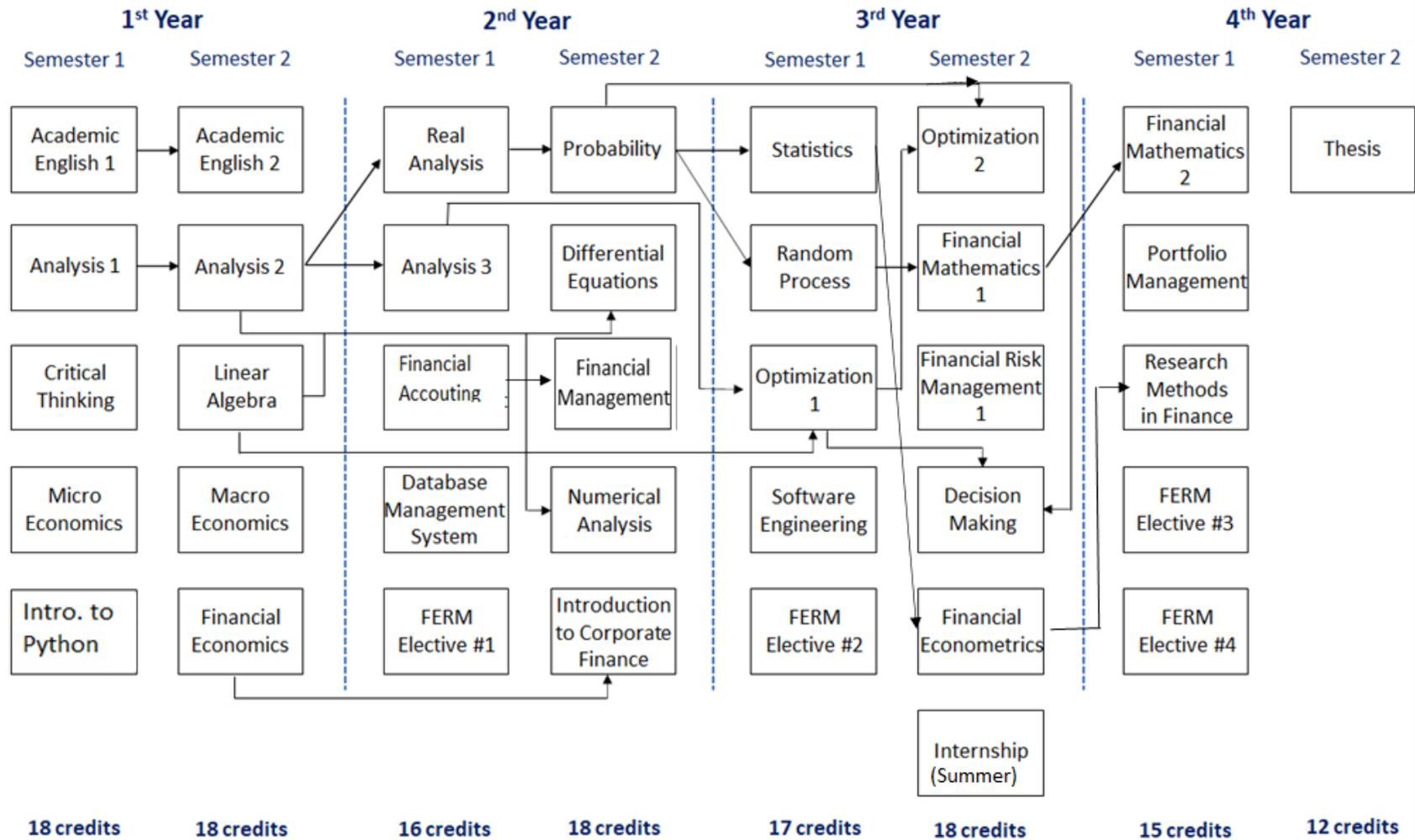
Department Elective courses

	Codes	Subjects	Credits			% practice/ total
			Total	Theory	Practice	
FERM Elective #1						
1	MAFE209IU	Financial markets	3	3		
2	MAFE210IU	Functional analysis	4	4		
3	MAFE211IU	Web application programming	4	3	1	1/4
FERM Elective #2						
4	MAFE310IU	Modeling and simulation	4	3	1	1/4
5	MAFE311IU	Asset pricing	3	3		
6	MAFE312IU	Data mining	4	3	1	1/4
FERM Elective #3						
7	MAFE404IU	Financial Risk Management 2	3	3		
8	MAFE411IU	Introduction to Operations research	3	4		
9	MAFE406IU	Parallel computing	4	3	1	1/4
FERM Elective #4						
10	MAFE407IU	Mathematical economics	4	4		
11	MAFE410IU	Exchange rates and International finance	3	3		
12	BA306AF	Financial statement analysis and business evaluation	3	3		

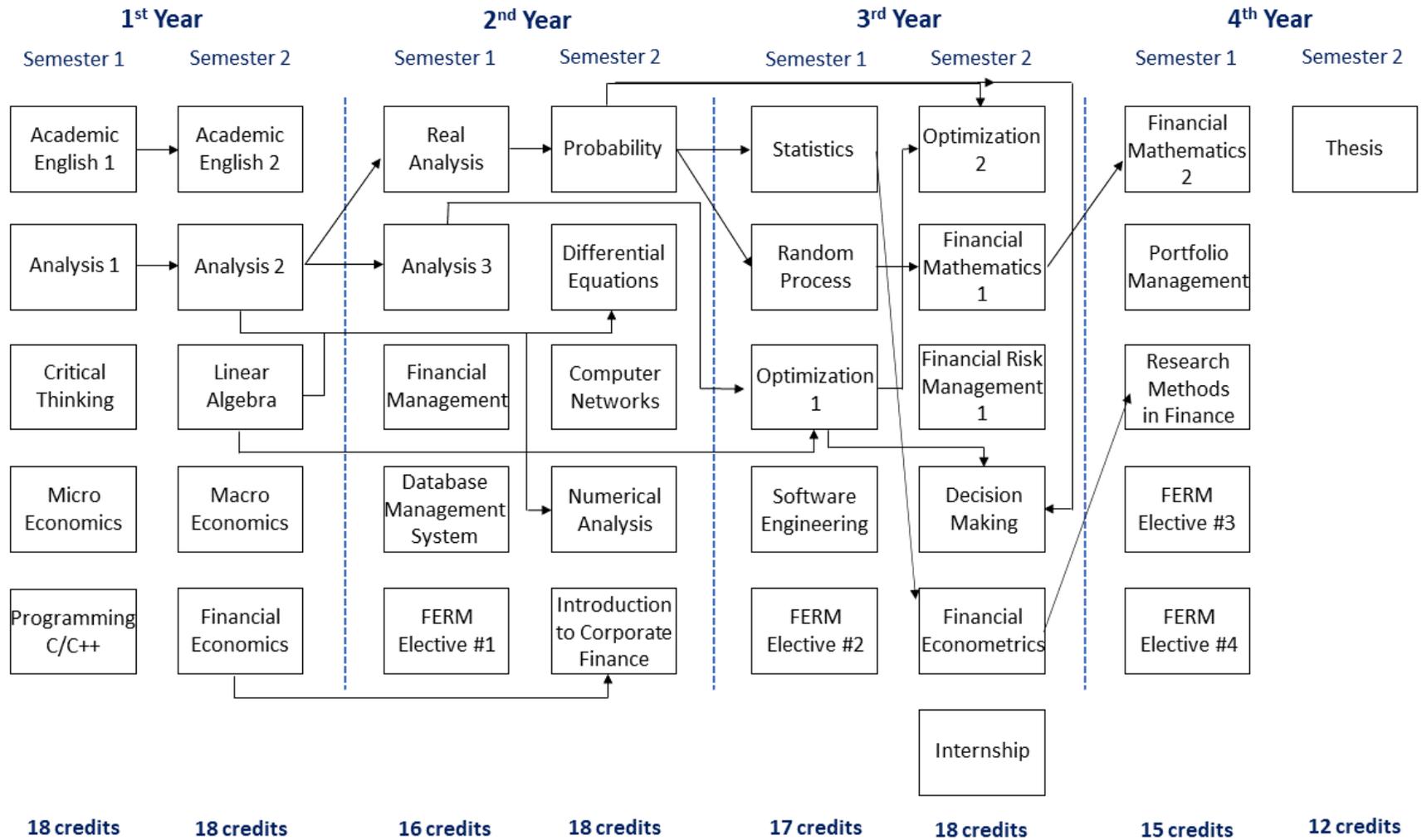
Remark: Students of K2021 and after will take “Introduction to Python” instead of “Programming C/C++” and “Financial Accounting” instead of “Computer Networks”.

3.6. Curriculum Map

3.6.1. For K2021 intake:



3.6.2. For K2020 intake and before:



3.7. Admission Criteria

Students can obtain admission to the degree program by one of the following paths:

- National Entrance Examination: The examination in late June is for all candidates who successfully finish high schools in the accredited Vietnamese educational system.
- Academic Records during the 10th, 11th and 12th grades of designated high schools
- Direct Admission: Students who achieve prizes in national level competitions, such as the National Academic Contests and International Olympia may be directly admitted to the school.
- Transfer: Students who study in international schools may be admitted based on their academic performance at high school after an interview with the Admission Panel.
- Results of the Scholastic Aptitude Exam held by VNU.
- Ability test: Students can register to attend an SAT II-format test provided by IU to obtain an offer to the university.

3.8. Graduation Criteria

To complete the Bachelor of Applied Mathematics, a student must complete the required number of courses listed in the course list provided in part 3.5 and meet all following requirements:

- Adhere to the regulations and training policy of Vietnam National University Ho Chi Minh City and International University.
- Accumulate enough credits of the program with a GPA higher than 50/100.
- Achieve English proficiency equal to IELTS 6.0 or equivalent.
- Finish the Bachelor thesis and defend it in front of a thesis advisory committee.

3.9. Teaching – Learning Strategies

- **Articulation and communication of the educational philosophy**

The educational philosophy is well articulated and communicated to all stakeholders. The faculty teaching strategy is based on constructivism philosophy, which emphasizes that learning is an active, social process. In other words, learners should learn to discover principles, concepts and facts for themselves, and individuals make meanings through interactions with each other and with the environment they live in. In addition, learners take part in activities directly relevant to the application of the learning. The teaching and learning strategy of the department therefore focuses on the following:

- Student oriented

- Collaborative learning
- Experiential learning
- Integration of theory and practice
- Utilization of IT
- Research oriented

This educational philosophy is shared among the faculty during faculty meeting when senior and junior lecturers discuss on how to improve their teaching, and between lecturers and students as the lecturers introduce their courses and the way they will work together.

- **Constructive alignment of teaching and learning activities**

Teaching and learning activities are constructively aligned to the achievement of the expected learning outcomes. For each course, the lecturer responsible is to develop expected learning outcomes, teaching and learning activities to achieve those learning outcomes, and appropriate assessment schemes. In the FERM program, the following teaching and learning activities are highlighted.

- **Student oriented**

In class, lecturers encourage students by posing questions and group discussion whenever it is appropriate. Assignments and projects are designed in such a way that students can develop their mathematical thinking.

Even though the FERM class size is relatively small, teaching assistants are also provided to assist students in areas in which they are lacking. Lecturers have also built a good rapport with students, which allows them to address students' needs and interests, and creating a feedback loop for continuous improvement.

- **Collaborative learning**

Group work in assignments, projects and laboratory experiments is common in most FERM courses. Thus, students can learn how to work cooperatively and support each other, develop effective teamwork and communication, assimilate multiple views to deepen their knowledge and promote critical thinking.

- **Research oriented**

The FERM program aims to facilitate students' research ability, which aligns with the university vision of becoming a leading research oriented university. During the course, FERM students are guided to study materials based on recent literature and research findings and make presentations of what they have learned. In many courses, students practice doing research in small projects with assigned problems and write academic reports. All FERM students are required to complete a thesis

with oral defense for graduation, with topics varying from a real case study to theology.

Students are also encouraged to join research projects with faculty or register research proposals following their own interests to the Office of Research and Development.

- **Utilization of IT**

Each classroom is well-equipped with a computer, projector, and board. The online Blackboard website system support lecturers in providing course materials and making announcements to classes. Lecturers use professional software to teach students proper citation methods as well as to safeguard against potential plagiarism. Discussions between teachers and students are not limited to class hours; students can consult lecturers via emails, Facebook or in the office.

- **Lifelong learning**

The teaching and learning activities enhance lifelong learning. The fact that all FERM classes are conducted in English helps students practice and improve their English competency, an important skill for life-long learning. Lecturers also help students to learn by searching for references and correlating their acquired knowledge with the real problems. In many courses, lecturers assign individual or group projects which require students to solve real-life issues and learn from one another. FERM students are also particularly strong in IT skills because they have to apply programming and advanced software to solve real large-scale problems.

4. Scholarship policies

4.1. Entrance Scholarships

a. Scholarship Criteria

- **Scholarship criteria for enrollment method 1:** based on total score of 3 subjects for admission, greater than or equal to:
 - 100% scholarship: 25
 - 50% scholarship: 24
- **Scholarship criteria for enrollment method 2:** based on total score of 3 subjects for admission, greater than or equal to:
 - 100% scholarship: 25
 - 50% scholarship: 24
- **Scholarship criteria for enrollment method 3:**

Awards	Scholarship
National First prize	100% scholarship for 4 years
National Second prize	100% scholarship for 3 years
National Third prize	100% scholarship for 2 years
National Consolation prize	100% scholarship for 1 year
International First/Second/Third prize	100% scholarship for 4 years
International Consolation prize	100% scholarship for 3 years

- **Scholarship criteria for enrollment method 4:** based on total score of 2 subjects for admission, greater than or equal to:
 - 100% scholarship: 160
 - 50% scholarship: 155

- **Scholarship criteria for enrollment method 6:** based on the result of the Test from National Universities HCMC, great than or equal to:
 - 100% scholarship: 960
 - 50% scholarship: 950

b. Criteria for retaining a scholarship

Students must be in good academic standing with a GPA of 70/100 or above, with no grade lower than 50/100.

4.2. Encouragement Scholarships

Scholarship: 15 million VND for official semester, 7.5 million VND for summer semester for students. (Awarded each semester to students with the highest GPAs, according to the number of scholarships available.)

Minimum criteria:

- Has completed the AE1 English program.
- No grade lower than 50/100 including physical training and military education.
- GPA > 70/100.
- The number of registered credits is at least 12 for an official semester, 6 for summer semester.

5. Student Support Services

5.1. Library and Academic databases

Established in 2003, the IU Library has become an integral part of the University for supporting a vibrant learning, teaching and research culture. The library consists of 2 floors, with more than 1,000 square meters, modern equipment, and an automated library management system.

The strength of the IU Library is in its collection. The printed collection, which includes textbooks and monographs, has evolved over a decade, and thus provides students with a great variety of resources. Library users can also access well-known academic databases such as InfoTrack, Springer Link, Taylor & Francis, ProQuest, IEEE, ACS, and Wiley.

Besides, every IU-affiliated user is eligible to access the IUL institutional repository - an online Thesis Database. Understanding the needs of students and teaching staff, IU Library is launching a number of initiatives for improving its quality: enhancing the collections, furniture, and equipment to satisfy the growing demand; providing more online utilities/products to maximize access to collections; providing training courses to develop research skills for students; and developing quality consultation services.

5.2. Alumni and Industry relationships

The Department of Mathematics has built relationships with several reputable corporations such as: HSC, WorldQuant, VietQuant, and other banks, etc... The interaction between the department with the corporations helps to strengthen the links between formal learning and professional practice. In addition, we also support students to obtain internships in one of our cooperating firms. The purpose of the internship is to provide students with real world experience so that they can put theory into practice.

6. Academic regulations

6.1. Course registration

- Students should register for a minimum of 12 credits in each semester, except for the last semester.
- Students should register for a maximum of 24 credits in each semester, except for the last semester.
- Subject registration is via the Edusoft website and must be approved by the academic advisor.

6.2. Summer Internship registration

Students may register for a summer internship only after they have achieved at least 75% of total credits. The internship is normally undertaken in the summer semester of the year before doing the graduation thesis. The internship requires a minimum of 8 weeks of full-time working. Students who have undertaken a summer internship have gained the following benefits:

- Formed relationships with people in the industry
- Gained industrial experience and knowledge beneficial for their final year thesis
- Learned about current challenges in the industry and how to overcome them
- Understood personal responsibility and developed teamwork skills.

6.3. Thesis registration

To register for the thesis, students must meet the following criteria:

- Have accumulated at least 90% of total credits.
- Not under any academic admonishment.

After successful registration, the student must contact the supervisor and determine the thesis topic. Then they will have at least 12 weeks to finish their work, including a thesis proposal, thesis report and thesis defense.

6.4. Adding and dropping courses

In each semester, in the first week of teaching, based on their timetable, ability, and circumstances, students can add or drop courses via the Edusoft website.

6.5. Requirements for taking final examinations

- If a student is absent for more than 20% of the required class time, the student will be prohibited from taking the final examination, and a score of zero will be recorded.
- On the examination date, a student who is more than 15 minutes late will not be allowed to enter the examination room, and a score of zero will be recorded.

6.6. Course assessment

Student performance is assessed by the following methods with the corresponding weightings:

Final exam: 40% - 60%

Midterm exam: 20% - 30%

Coursework (assignments, group presentations, short tests, etc): 20% - 30%

6.7. Grade scales

Classification	GPA	4 Point Grading Scale	100 Point Grading Scale	Point Grading Scale in Letters
<i>Passing</i>				
Excellent		4.0	$90 \leq \text{GPA} \leq 100$	A+
Very Good		3.5	$80 \leq \text{GPA} < 90$	A
Good		3.0	$70 \leq \text{GPA} < 80$	B
Average		2.5	$60 \leq \text{GPA} < 70$	C+
Ordinary		2.0	$50 \leq \text{GPA} < 60$	C
<i>Fail</i>				
Weak		1.5	$40 \leq \text{GPA} < 50$	D+
Very weak		1.0	$30 \leq \text{GPA} < 40$	D
		0.0	$\text{GPA} < 30$	F

6.8. Academic suspension

In the following cases, a student will be asked to temporarily suspend his/her study:

- Exceeds the time limit for study (6 years)
- Drops out of university for more than 1 semester without the approval of IU
- Is admonished more than 2 times
- Has not paid the tuition fees on time

Course Description

1. Writing AE1 (EN007IU)

Duration: 2 credits (2,0)

Prerequisite: Students must have achieved TOEFL pBT 500 or TOEFL iBT 60

Brief description of the subject content: The subject aims to improve pre-advanced writing skills. The program focuses on writing essays based on writing skills such as: making an outline, writing thesis sentences, connecting, and sequencing paragraphs, using words and linking phrases to create coherence. Literature. Categories include describing people, objects, processes, presenting ideas, comparing and contrasting, cause-to-effect, problem-solution, argument.

2. Listening AE1 (EN008IU)

Duration: 2 credits (2,0)

Prerequisite: Students must have achieved TOEFL pBT 500 or TOEFL iBT 60

Brief description of the subject content: Academic English listening, note-taking, and discussion skills will help students familiarize themselves with the challenges of learning English in college. Students will learn essential skills for international university students, including listening to lectures actively, taking effective notes, and participating in discussions confidently. Along with listening skills, students will also hone their academic vocabulary.

3. Analysis 1 (MAFE101IU)

Duration: 4 credits

Prerequisite: No

Brief description of the subject content: Is a basic subject, taught to students in semesters 1 and 1 of Financial Engineering and Risk Management. Main contents: Functions, Limits, Continuity, Derivative, Derivative for fundamental functions, Rule of derivative calculation, Application of derivative, L'hospital rule, Optimal, Newton method.

4. Critical Thinking (PE008IU)

Duration: 3 credits (3,0)

Prerequisite: No.

Brief description of the subject content: This course provides students with the background knowledge of analytical thinking, useful skills for all subjects of the profession. Students practice with forms of reasoning, analyzing, evaluating their own and that of others. Students are supported in searching information to reason and verify reasoning.

5. Microeconomics (BA117IU)

Duration: 3 credits

Prerequisite: No

Brief description of the subject content: The knowledge in this topic will allow the generation of understanding not only of the economic concepts and scarce resources of the market and its elements, but also to evaluate other types of market structures. and government interventions in the market. This course also provides students with the skills necessary to evaluate the factors of economic efficiency. All these concepts and knowledge help students plan a business for the short and long term to grow more efficiently by considering the effects of government policy.

6. Introduction to Python (MAFE109IU)

Duration: 4 credits (3,1)

Prerequisite: No.

Brief description of the subject content: The course provides students the basics of the Python programming language with some applications for data science, e.g., data collection, data manipulation, data visualization, and data analysis. Students will learn about the basic skills for general programmings, such as conditional, loops, functions, lists, and classes. Furthermore, students will: learn how to write their own codes, get data from the different sources, organize data for the usable format, and then analyze the dataset. Some useful packages for engineering and finance are also introduced in the course. Additionally, students will learn classes and Object-Oriented Programming.

7. Writing AE2 (EN011IU)

Duration: 2 credits (2,0)

Prerequisite: Specialized English 1 (Writing Skills)

Brief description of the subject content: The course aims to provide an overview of the structure of a research report, step by step to help students complete a specific article in their field. The content of the course includes the components of the report, the skills to choose and limit topics, write thesis statements, make an outline, find and document documents, take notes, write essays, and content. main and conclusion, write and correct drafts. Students will practice on topics related to their subjects.

8. Speaking AE2 (EN012IU)

Duration: 2 credits (2,0)

Prerequisite: Student must pass Toefl pBT 500 or Toefl iBT 60

Brief description of the subject content: The course provides students with practical strategies for use in making presentations. In addition, students are helped form listening skills, commenting, and giving feedback on other presentations in class.

9. Analysis 2 (MAFE103IU)

Duration: 4 credits (3,1)

Prerequisite: Analysis 1

Brief description of the subject content: This is the next basic subject of Analysis 1, teaching students the second-and first-year semesters of Financial Engineering and Risk Management. Main contents: integral, calculation, basic theorem of calculus, broad deductive integration, applying analytic to calculate area, volume, supply length, and some quantity in economics and technology.

10. Linear Algebra (MAFE104IU)

Duration: 4 credits (3,1)

Prerequisite: No

Brief description of the subject content: Systems of linear equations, matrices, determinants, vector spaces, linear transformations, eigenvectors and eigenvalues.

11. Macroeconomics (BA119IU)

Duration: 3 credits

Prerequisite: No

Brief description of the subject content: This course provides students with the knowledge to understand broad topics about the economics of a country or region and evaluate macroeconomic policies and changes of the whole economy. on a national and international scale. This course will provide students with the ability needed to evaluate components, the economy as a whole. All these concepts and knowledge help students to plan a business in the short and long term more efficiently by considering the effects of government macro policy.

12. Financial Economics (MAFE105IU)

Duration: 3 credits

Prerequisite: No

Brief description of the subject content: This course provides and complements students with financial foundations. In particular, the course will focus on the time value of money, the basic models of savings and financial investment, and the process of financial risk management.

13. Philosophy of Marxism-Leninism (PE011IU)

Duration: 5 credits (5,0)

Prerequisite: No

Brief description of the subject content: In addition to an introductory chapter to introduce a brief description of Marxism-Leninism and some general problems of the subject. Based on the subject's objectives, the content of the subject's program is structured into 3 parts, 9 chapters: The first part has 3 chapters covering the basic contents of the worldview and the methodology of Marxism- Lenin; The second part has 3 programs presenting three central contents of the Marxist-Leninist economic doctrine of capitalist production methods; The third part has 3 chapters, of which 2 chapters generalize the basic contents of Marxist-Leninism's theory of socialism and 1 chapter generalize realism and prospects.

14. Real Analysis (MAFE201IU)

Duration: 4 credits (3,1)

Prerequisite: Analysis 1, Analysis 2

Brief description of the subject content: Lebesgue measure for one-variable function, Lebesgue one-variable measure, Lebesgue measure on a straight line, Lebesgue measurable, Lebesgue integration, L_p space, Metric space, Mechanical theorems version of metric space, General measure space, Integral on general measure space.

15. Database Management Systems (MAFE204IU)

Duration: 4 credits (3,1)

Prerequisite: No

Brief description of the content: The course introduces an overview of the models for database management systems. In particular, the subject emphasizes the components, the basis of mathematics, also the operating principle of a database management system according to the relational model. In addition, the subject also introduces the design and optimization of relational subjects.

16. Financial Accounting (MAFE212IU)

Duration: 4 credits (3,1)

Prerequisite: No

Brief description of the content: Financial Accounting is an entry-level course that explores the basis of accounting that would be beneficial to students seeking a degree in the business area. Students will be introduced to the importance of accounting within the business environment and how accounting information can be utilized to facilitate business decisions.

17. Differential Equations (MAFE202IU)

Duration: 4 credits (3,1)

Prerequisite: Analysis 2

Brief description of the subject content: First, quadratic differential equations; System of linear one hierarchical differential equation; Number methods; Separate derivative equation.

18. Analysis 3 (MAFE203IU)

Duration: 3 credits

Prerequisite: Analysis 1, 2

Brief description of the subject content: Is the basic subject following Analysis 1 and 2, teaching semester 1 and 2 students in Financial Engineering and Risk Management. Main contents: partial derivative, multiple integrals, line integral and surface integrals, and calculation methods.

19. Financial Management (MAFE215IU)

Duration: 3 credits

Prerequisite: Financial Accounting

Brief description of the subject content: Knowledge of financial principles facilitates managers in almost every field of business. This course is an introductory course to finance and is the main prerequisite for Corporate Finance, covering a wide range of more specialized math topics. The content of the course integrates both theoretical and mathematical information.

The basics of the time value of money, valuation and rate of return, cost of capital, and capital budget are included. Students will learn how financial markets work, about different types of securities and financial instruments, and about how cash flows are managed. Risk, working capital management, financial leverage, forecasting, analysis of financial statements, and financial ratios are given special attention. This course will provide students with basic financial math skills and is a great introduction to the concepts of financial management.

20. Probability (MAFE206IU)

Duration: 4 credits

Prerequisite: Students have learned Real Analysis

Brief description of the subject content: The subject presents the theory of probability from the point of view of measurement. The main contents include knowledge of events (independent, conditional probability, ...), random variables, distributions, expectations, variance, conditional expectation and important limit theorems in probability (central limit theorem, law of large numbers, ...).

21. Decision Making (MAFE207IU)

Duration: 3 credits

Prerequisite: Probability, Optimization 1

Brief description of the subject content: Decision making is one of the most important parts in research and management science. Decision-making techniques help managers choose the best options based on quantitative criteria. This course provides students with the basics of decision-making models through which they will make decisions. In addition, the course also provides students with special techniques for practical application into practice.

22. Functional Analysis (MAFE210IU)

Duration: 3 credits

Prerequisite: Analysis 1, 2

Brief description of the subject content: It is a subject on math foundations, taught to 2nd-year students in Financial Engineering and Risk Management. Main content: important general spaces: topological space, metric space, normative space, function and linear operator, some important properties and theorems, some specific spaces, and the linear function on it.

23. Numerical Analysis (MAFE208IU)

Duration: 4 credits (3,1)

Prerequisite: Analysis 3

Brief description of the subject content: Introduction to MATLAB, Error, Solution of an implicit equation, Interpolation and polynomial approximation, Derivative and Integral, First value problem for differential equations, System of equations linear algebra, Root of the partial derivative equation.

24. Ho Chi Minh's Thought (PE005IU)

Duration: 2 credits (2,0)

Prerequisite: Basic Principles of Marxism-Leninism.

Brief description of the subject content: In addition to the introductory chapter, the subject's content includes 7 chapters: chapter 1, presenting the basis, the process of formation, and development of Ho Chi Minh's thought; from chapter 2 to chapter 7 present the basic contents of Ho Chi Minh Thought according to the subject's objectives.

25. Revolutionary Lines of the Communist Party of Vietnam (PE003IU)

Duration: 3 credits (3,0)

Prerequisite: Basic Principles of Marxism-Leninism, Ho Chi Minh Thought

Brief description of the subject content: The main content of the subject is to provide students with basic systematic insights into the Party's policies.

26. Statistics (MAFE301IU)

Duration: 4 credits

Prerequisite: Probability

Brief description of the subject content: Discrete and continuous distribution, sample distribution, confidence interval, hypothesis test, analysis of variance, regression and non-parametric test.

27. Random Processes (MAFE302IU)

Duration: 3 credits

Prerequisite: Students have studied Probability Theory

Brief description of the subject content: The subject includes the basic knowledge of random processes: Poisson process, Markov chain, Martingale, Ito calculus, stochastic differential equations.

28. Optimization 1 (MAFE303IU)

Duration: 4 credits (3,1)

Prerequisite: Analysis 2

Brief description of the subject content: Is a fundamental subject in optimization, teaching 2nd year students in Financial Engineering and Risk Management. Main content: unbound optimization, some practical examples of bound and random optimization, convex analysis, convex optimization, and Karush-Kuhn-Tucker optimization, simple post-correction problem, the saddle jaw, the point-in method of duality.

29. Financial Econometrics (MAFE304IU)

Duration: 4 credits

Prerequisite: Statistics

Brief description of the subject content: The course helps students learn about models and the possibility of applying econometric models to financial activities in practice, including time series and data. panel data to forecast and evaluate the performance of financial assets such as bonds, equity and derivative securities, as well as examining the long-term variability and linkages between types This financial assets.

30. Corporate Finance (MAFE305IU)

Duration: 3 credits

Prerequisite: Financial economics

Brief description of the content: The course introduces corporate financial management practices, with emphasis on capital budgeting, capital structure, the tradeoff between risk and return, and capital pricing models, and project valuation, as well as M&A activities in the financial market.

31. Financial Mathematics 1 (MAFE306IU)

Duration: 3 credits

Prerequisite: Students have studied Random Process

Brief description of the subject content: The course provides mathematical concepts and tools corresponding to financial concepts: profit, interest rate, cash flow, bonds, portfolio, asset valuation. real estate, the fundamentals of finance.

32. Optimization 2 (MAFE307IU)

Duration: 3 credits

Prerequisite: Optimization 1

Brief description of the subject content: Is the next subject of Optimization 1, teaching 2nd and 3rd-year students of Financial Engineering and Risk Management. Main contents: Linear planning and convex planning, monomorphic method, Karush-Kuhn-Tucker optimal conditions, convex and non-convex random hunger theory, linear post-correction problem, optimal control, decomposition method, and many practical problems.

33. Financial Risk Management 1 (MAFE308IU)

Duration: 3 credits

Prerequisite: No.

Brief description of the subject content: The course introduces the history and development of risk management activities around the world to help students have an overview of the risk management industry and the development trend of the financial risk management industry. major future in Vietnam. The course will then introduce the basic techniques in financial risk management, especially in the methods of risk identification and measurement. Finally, the course will explore some cases of using financial derivatives to minimize financial risks for business and financial enterprises.

34. Software Engineering (MAFE309IU)

Duration: 4 credits (3,1)

Prerequisite: no

Brief description of the subject content: Students will learn aspects of software development such as software design (object-oriented, architectural design), user interface design, testing, and cost estimation.

35. Modeling and Simulation (MAFE310IU)

Duration: 4 credits (3,1)

Prerequisite: Probability, Statistics

Brief description of the subject content: Modeling, simulating, and analyzing financial models and risk management, continuous and discrete simulation at many levels in simulation software, analyzing the Statistical aspects in simulation, including input factor analysis, random state generation, output analysis, and variance reduction techniques. Students will gain experience in building simulation models through exercises on simulating financial models and risk management.

36. Operations Research (MAFE405IU)

Duration: 4 credits (3,1)

Prerequisite: Students have learned Linear Algebra

Brief description of the subject content: The first part of the course provides students with basic knowledge of linear planning theory and monomorphic algorithms. Then students learn important problems in operations such as online flow problems, transport problems, project management problems, decision making theory, game theory and forecasting techniques. basic. With each type of problem, students are familiarized with specific models and practice solving them with appropriate software on the computer during practice hours.

37. Mathematical Economics (MAFE407IU)

Duration: 3 credits

Prerequisite: Analysis 2

Brief description of the subject content: It is the basic subject of applying mathematics to economic models, for 2nd or 3rd-year students in Financial Engineering and Risk Management. Main content: additional knowledge about non-wireless planning, the practice of consumption, utility function, welfare market, theory of demand, competitive balance and the stability of this balance, optimal growth.

38. Financial Mathematics 2 (MAFE401IU)

Duration: 3 credits

Prerequisite: Financial Math 1

Brief description of the subject content: The knowledge in this topic will allow to generate understanding of financial math models applied in the financial industry. The course will begin with a review of mathematical knowledge and statistical probability related to the financial math field. Then we will study in detail the Black-Scholes option pricing, risk management and portfolio management models. Before the end of the course, we will study advanced topics in the field of financial math through important research recently published by prestigious international financial journals.

39. Financial Risk Management 2 (MAFE404IU)

Duration: 3 credits

Prerequisite: Financial Risk Management 1

Brief description of the subject content: The knowledge in this topic will allow generating a detailed understanding of risk management methods based on Value-at-risk tools. The course will introduce simple risk measurement to the complex models of the Value-at-risk tool.

40. Exchange Rates and International finance (MAFE410IU)

Duration: 3 credits

Prerequisite: Macroeconomics

Brief description of the subject content: International finance plays an important role in the economy at both the macro and micro levels. From a micro perspective, the factors that make up the international financial market such as foreign exchange, exchange rate, macro policy ... directly affect the growth of the economy. Therefore, the course will range from the basics of the financial market to the analysis of patterns, policies and macroeconomic factors that affect businesses such as exchange rates, inflation, crisis, and financial risk management from a macro perspective.

41. Asset Pricing (MAFE311IU)

Duration: 3 credits

Prerequisite: Financial Management, Corporate Finance.

Brief description of the subject content: Valuation is a classic subject from the inception of the fundamental subjects of finance and financial structure by Merton Miller and Franco Modigliani. Based on this model, we will develop popular and modern models of

asset and firm valuation in different environments and conditions. In particular, the subject will delve into the models of professors Alfred Rappaport and Joel Stern (Stern Stewart & Co.) with practical applications.

42. Financial Markets (MAFE209IU)

Duration: 3 credits

Prerequisite: No.

Brief description of the subject content: This course provides students with knowledge and understanding of the role of state financial intermediaries in the financial market. Distinguish between escrow and non-escrow financial institutions. Understand and analyze the operational structure of financial markets. Distinguish between different types of markets such as stocks, currencies, bonds, and different financial sectors.

43. Portfolio Management (MAFE402IU)

Duration: 3 credits

Prerequisite: No

Brief description of the subject content: Students are provided: an introduction to modern portfolio management theory, portfolio management strategies, financial instrument pricing models, risk assessment and acquisition by standards, the CAPM model and other financial issues.

44. Web Application Programming (MAFE211IU)

Duration: 4 credits (3,1)

Prerequisite: No

Brief description of the subject content: Introduce basic concepts in web programming such as client-side programming, server-side programming. Introduces the syntax of popular web programming languages, tools, and development environments such as HTML, Java Server Page, Java Bean, MVC model, Java utilities and development environments, extended Java frameworks as Ajax and Struts.

45. Parallel Computing (MAFE406IU)

Duration: 4 (3,1)

Prerequisite: no

Brief description of the subject content: The subject refers to terms in parallel programming, memory architecture, programming models such as threads model, Message Passing model, data parallel model ...

46. Research Methodology in Finance (MAFE403IU)

Duration: 3 credits

Prerequisite: Financial Econometrics.

Brief description of the subject content: In the first half of the course, students will learn standard time series topics. The second part is devoted to presenting 'non-standard' techniques of time series theory such as single-variable and multivariable GARCH and state space modeling. These topics will be discussed along with real-world examples in finance.

47. Financial Statement Analysis and Business Evaluation (BA306AF)

Duration: 3 credits

Prerequisite: Financial Management

Brief description of the subject content: This course is based on the concepts of financial economics, business strategy, accounting, and other business principles to evaluate business decisions under different conditions. This course is useful for students wishing to develop careers in the fields of investment banking, stock analysis, credit analysis, consulting, public finance, and corporate governance.

The course emphasizes practical applications, so much of the course will be spent analyzing and discussing cases related to financial statements in practical decision-making situations. This approach is complemented by lectures, discussing materials in textbooks or financial articles.

48. Data Mining (MAFE312IU)

Duration: 3 credits

Prerequisite: No.

Brief description of the subject content: The course introduces concepts, algorithms, techniques, and systems in Data Warehouse and Data Mining, including (1) data preprocessing, (2) design and implementation Data warehouse and Online Analytical Processing (OLAP) systems, (3) Data Mining methods, including frequent pattern analysis, classification and prediction, analysis group of data.

-THE END-