Decision of the FIBAA Accreditation and Certification Committee

21st Meeting on March 27, 2026

PROGRAMME ACCREDITATION

Project Number:	24/060 Cl. 5
Higher Education Institution:	National Economics University
Location:	Hanoi, Vietnam
Study programme:	Data Science in Finance and E-commerce Artificial Intelligence Software Engineering
Type of accreditation:	initial accreditation

The FIBAA Accreditation and Certification Committee has taken the following decision:

Accreditation
According to § 7 (6) in conjunction with § 9 (1) of the FIBAA General Terms and Conditions within the framework of procedures for the award of the FIBAA Quality Seal for Programmes from January 1, 2021 the study programmes are accredited with three conditions.

Conditions:

Condition 1 (see chapter 3.1.6): The University incorporates scientific methods into the curriculum to support the development of students' research and analytical skills.

Condition 2 (see chapter 3.2.2): The University reviews and updates the Diploma Supplements.

Condition 3 (see chapter 3.3.2): The University reviews and updates the materials and reading lists for the courses of the study programmes in the course descriptions.

The FIBAA Accreditation and Certification Committee decided to convert the recommendations contained in Chapter 2.5 into a condition. Consequently, a fourth condition is imposed:
***Condition 4 (see chapter 2.5):** The University:*

- *introduces an English language proficiency test as an admission requirement to ensure that students are sufficiently prepared to undertake studies in English; and*
- *offers preparatory intensive courses, such as English boot camps or supplementary English courses, for students who do not meet the required IELTS standards, in order to support their academic development and enable their successful participation in the study programmes.*

Proof of meeting these conditions is to be submitted by December 26, 2026.

Period of Accreditation: March 27, 2026, to March 26, 2031.

The FIBAA Quality Seal is awarded.

FOUNDATION FOR INTERNATIONAL
BUSINESS ADMINISTRATION ACCREDITATION
FIBAA – BERLINER FREIHEIT 20-24 – D-53111 BONN

Assessment Report

Higher Education Institution:
National Economics University, Hanoi, Vietnam

Bachelor programmes:
1. Data Science in Finance and E-commerce
2. Artificial Intelligence
3. Software Engineering

Qualification awarded on completion:
1. BS (Hons) in Data Science in Finance and E-commerce
2. BS (Hons) in Artificial Intelligence
3. BS in Software Engineering

General information on the study programmes

Brief description of the study programmes:

The **Bachelor of Data Science in Finance and E-commerce** equips students with foundations in data science, mathematics, statistics, and computer science, combined with domain knowledge in finance, economics, and e-commerce. It prepares graduates to analyse and manage large datasets, develop data-driven solutions, and support decision-making processes in businesses, financial institutions, and digital commerce environments.

The **Bachelor of Artificial Intelligence** focuses on developing competencies in artificial intelligence, machine learning, data analytics, and advanced computational methods.

Bachelor of Software Engineering provides students with knowledge and skills in software development, system design, programming, and software project management. It emphasises practical training and industry-relevant competencies, preparing graduates to develop, deploy, and maintain software systems for business, management, and digital technology applications.

Type of study programme:
For all programmes: Bachelor programmes

Projected study time and number of ECTS credits / national credits assigned to the study programme:
Data Science in Finance and E-commerce, and Artificial Intelligence
4 years – 130 Vietnamese credit points / 205.4 ECTS credits for a Bachelor's degree
4.5 years – 150 Vietnamese credit points / 237 ECTS credits for an Engineer degree

Software Engineering
4 years – 130 Vietnamese credit points for a Bachelor's degree / 205.4 ECTS credits

Mode of study:
For all programmes: full-time

Didactic approach:
For all programmes: study programme with obligatory class attendance

Double/Joint Degree programme:
No

Scope (planned number of parallel classes) and enrolment capacity:
Data Science in Finance and E-commerce and Artificial Intelligence: 3 classes per year, 40 students per class
Software Engineering: 2 classes per year, 40 students per class

Programme cycle starts in:
For all programmes: September (Autumn semester)

Initial start of the programme:
September 2024

Type of accreditation: initial accreditation

Procedure

A contract for the initial of the Bachelor of Data Science in Finance and E-commerce, Bachelor of Artificial Intelligence, Bachelor of Software Engineering was concluded between FIBAA and National Economics University, Hanoi on July 31, 2025. On October 5, 2025, the HEI submitted a self-evaluation report, which included a detailed description of the programme and further documents in order to prove that the criteria for programme accreditation are met.

At the same time, FIBAA appointed a review panel[1]. The HEI has agreed with the chosen experts. The panel consisted of:

Assoc. Prof. Dr. Nguyen Huu Cuong
University of Phuong Dong, Hanoi
Acting President

Dr. Jörg Dubiel
JR Dubiel AI-Consulting
Principal Founder
Advisor – Decision Intelligence

Dr. Arshad Jamal
QFBA-Northumbria University
Dean of Academic Affairs
Artificial Intelligence, Information Systems, Computing, Data Analytics, Cyber Security, Strategy

Luft Kettenbeil
University of Göttingen
Master in Applied Computer Science and Applied Data Science

Prof. Dr.-Ing. Sandro Leuchter
Technical University of Applied Sciences Mannheim
Professor for Distributed and Mobile Applications, Computer Science Department

Prof. Dr. Veith Tiemann
International School of Management (ISM)
Full Time Professor, Data Science

FIBAA project manager:
Yuliia Bleshmudt

The assessment is based on the self-evaluation report, amended by further documents, as requested by the panel, and an on-site visit. The on-site visit took place on January 21-22, 2026, at the HEI's premises in Hanoi, Vietnam. At the end of the on-site visit, the panel gave short feedback on its first impressions to representatives of the HEI.

[1] The panel is presented in alphabetical order.

The assessment report based on this was delivered to the HEI for comment on 11 March 2026. The statement on the report was given up on 19 March 2026. It has been taken into account in the report at hand.

Summary

The Bachelor of Data Science in Finance and E-commerce, Bachelor of Artificial Intelligence, Bachelor of Software Engineering offered by National Economics University fulfils with several exceptions the FIBAA quality requirements for bachelor programmes and can be accredited by the Foundation for International Business Administration Accreditation (FIBAA) for five years starting on starting on March 27, 2026 and finishing on March 26, 2031, under conditions. The programmes are in accordance with the national and European Qualification Frameworks, the European Standards and Guidelines (in their applicable version valid as of the time of the opening of the procedure), and the Bologna Declaration.

The panel members identified a need for improvement in the following areas: methods and scientific practice, and course materials. They recommend the accreditation of three study programmes on condition of meeting the following requirements:

- **Condition 1** (see chapter 3.1.6): The University incorporates scientific methods into the curriculum to support the development of students' research and analytical skills.
- **Condition 2** (see chapter 3.2.2): The University reviews and updates the Diploma Supplements.
- **Condition 3** (see chapter 3.3.2): The University reviews and updates the materials and reading lists for the courses of the study programmes in the course descriptions.

Proof of meeting this condition is to be submitted by December 26, 2026.

Furthermore, the quality requirements that have not been fulfilled – for all study programmes Internationality of the student body and for Bachelor of Software Engineering – Positioning of the study programme on the job market for graduates ("Employability"), Practical business experience of faculty – are not an asterisk criterion and therefore do not lead to a condition.

The panel members identified several areas where the **three programmes** could be further developed and **recommend**:

- monitoring the English language proficiency of both students and lecturers and ensuring that all students can effectively follow and understand the lecture content and that lecturers can deliver the content properly in English (see chapter 1.2);
- considering the implementation of an English language proficiency test as an admission requirement in order to ensure that students are sufficiently prepared to study in English (see chapter 2.5);
- considering the provision of preparatory intensive courses (such as English boot camps or supplementary English courses) for students who do not meet the required IELTS requirements, in order to support their academic pathway and facilitate successful participation in the study programmes (see chapter 2.5);
- further integrating ethical, environmental, and societal considerations into the programmes (see chapter 3.1.5);
- introducing scholarships for female students, actively recruiting female lecturers, and considering offering introductory coding courses for female applicants and students. Such measures could further strengthen gender balance and inclusivity in STEM-related study programmes, particularly in fields such as Information Technology, Data

Science, and Artificial Intelligence, where women remain comparatively underrepresented (see chapter 3.2.4);
- increasing the number of guest lectures and invited speakers, including professionals from business and practice and international experts, for example through online participation.(see chapter 3.3.3);
- encouraging students to undertake internships in international companies, developing the recruitment of international students, and expanding lecturer exchange programmes to strengthen internationalisation (see chapter 3.4.1);
- considering and implementing measures to attract international students to the programmes (see chapter 3.4.2);
- making multidisciplinary competences and skills more explicit in the curriculum (e.g., project management and leadership) (see chapter 3.5);
- separating the roles of Dean and Programme Director and appointing a dedicated Programme Director (see chapter 4.2.1);
- the panel recommends taking initiatives to promote the systematic development of the study programmes in a manner which includes all relevant groups (see chapter 4.2.1);
- implementing a system of continuous feedback throughout the semester to further support the quality of teaching and learning (see chapter 5.1);
- implementing a peer review process for all lectures in order to further strengthen teaching quality and support continuous improvement (see chapter 5.2.2);
- ensuring that all information is translated into and made available in English (see chapter 5.3.1 and 5.3.2).

In addition, the panel members identified several areas where the **Data Science in Finance and E-commerce** study programme **could** be further developed and **recommend**:

- strengthening the business profile to make it more coherent and clearly articulated (see chapter 1.3.1);
- reconsidering the status of Linux Operating System, Network Communication, and Cloud Computing courses and evaluating the possibility of replacing them with courses such as Marketing and Introduction to Business as compulsory subjects, in order to better align the programme with its business-oriented focus (see chapter 3.1.1);
- including a project as a compulsory component of the programme (see chapter 3.1.3).

In addition, the panel members identified several areas where the **Artificial Intelligence** study programme could be further developed and **recommend**:

- including Information Security and Cloud Computing courses as compulsory courses within the curriculum and considering making the internship a compulsory component of the programme (see chapter 3.1.1);
- considering the separation of the internship report and the thesis (see chapter 3.2.2).

In addition, the panel members identified several areas where the **Software Engineering** study programme could be further developed and **recommend**:

- by analysing the educational market, also considering software engineering-related content degree programmes with names such as Information Science and Technology provided by other HEIs in Vietnam (see chapter 1.3.1);

- considering the impact of Artificial Intelligence (e.g., the evolving role of software engineers) and taking into account emerging market requirements in future analyses of employers and the job market (see chapter 1.3.2);
- strengthening the curriculum by including advanced programming courses, such as Functional Programming and Sustainable Software Engineering (see chapter 3.1.1);
- including development tools with generative AI in the curriculum (see chapter 3.1.1);
- inviting adjunct lecturers with relevant industry experience to contribute to the Software Engineering study programme in order to strengthen its applied and industry-oriented focus (see chapter 4.1.4).
-

The measures that the HEI takes in order to implement the recommendations of the panel members will have to be considered during the re-accreditation.

There are criteria in which the programmes exceed the quality requirements:

- Transparency and documentation of the admission procedure and decision;
- Foreign language contents;
- Academic qualification of faculty
- Pedagogical / didactical qualification of faculty
- Process organisation and administrative support for students and faculty
- Quantity, quality, media and IT equipment of teaching and group rooms
- Access to literature

For the overall assessment of the programme, please refer to the quality profile at the end of this report.

Quality profile

HEI: National Economics University (NEU)

Bachelor / Master programme:

1. Bachelor of Data Science in Finance and E-commerce (DS)
2. Bachelor of Artificial Intelligence (AI)
3. Bachelor of Software Engineering (SE)

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
1	**Objectives**					
1.1*	Objectives of the study programme (Asterisk Criterion)			X		
1.2*	International orientation of the study programme design (Asterisk Criterion)			X		
1.3	Positioning of the study programme					
1.3.1	Positioning of the study programme in the educational market			X		
1.3.2	Positioning of the study programme on the job market for graduates ("Employability")			DS, AI	SE	
1.3.3	Positioning of the study programme within the HEI's overall strategic concept			X		
2	**Admission**					
2.1*	Admission requirements (Asterisk Criterion)			X		
2.2	Counselling for prospective students			X		
2.3*	Selection procedure (if relevant)			X		
2.4(*)	Professional experience (if relevant; Asterisk Criterion for master programmes that require professional experience)					X
2.5*	Ensuring foreign language proficiency (Asterisk Criterion)				**Condition**	
2.6*	Transparency and documentation of admission procedure and decision (Asterisk Criterion)		X			
3	**Contents, structure and didactical concept**					
3.1	Contents					
3.1.1*	Logic and conceptual coherence (Asterisk Criterion)			X		
3.1.2*	Rationale for degree and programme name (Asterisk Criterion)			X		
3.1.3*	Integration of theory and practice (Asterisk Criterion)			X		
3.1.4	Interdisciplinary thinking			X		
3.1.5	Ethical aspects			X		
3.1.6*	Methods and scientific practice (Asterisk Criterion)				**Condition**	
3.1.7*	Examination and final thesis (Asterisk Criterion)			X		
3.2	Structure					
3.2.1*	Modular structure of the study programme (Asterisk Criterion)			X		

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
3.2.2*	Study and exam regulations (Asterisk Criterion)				X	
3.2.3*	Feasibility of study workload (Asterisk Criterion)			X		
3.2.4	Equality of opportunity			X		
3.3	Didactical concept					
3.3.1*	Logic and plausibility of the didactical concept (Asterisk Criterion)			X		
3.3.2*	Course materials (Asterisk Criterion)				**Condition**	
3.3.3	Guest lecturers			X		
3.3.4	Lecturing tutors			X		
3.4	Internationality					
3.4.1*	International contents and intercultural aspects (Asterisk Criterion)			X		
3.4.2	Internationality of the student body				X	
3.4.3	Internationality of faculty			X		
3.4.4	Foreign language contents		X			
3.5*	Multidisciplinary competences and skills (Asterisk Criterion)			X		
3.6*	Skills for employment / Employability (Asterisk Criterion)			X		
4.	**Academic environment and framework conditions**					
4.1	Faculty					
4.1.1*	Structure and quantity of faculty in relation to curricular requirements (Asterisk Criterion)			X		
4.1.2*	Academic qualification of faculty (Asterisk Criterion)		X			
4.1.3*	Pedagogical / didactical qualification of faculty (Asterisk Criterion)		X			
4.1.4	Practical business experience of faculty			DS, AI	SE	
4.1.5*	Internal cooperation (Asterisk Criterion)			X		
4.1.6*	Student support by the faculty (Asterisk Criterion)			X		
4.1.7(*)	Student support in distance learning (only relevant and an Asterisk Criterion for blended-learning/distance learning programmes)					X
4.2	Programme management					
4.2.1*	Programme Director (Asterisk Criterion)			X		
4.2.2	Process organisation and administrative support for students and faculty		X			
4.3	Cooperation and partnerships					
4.3.1(*)	Cooperation with HEIs and other academic institutions or networks			X		

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
	(Asterisk Criterion for cooperation programmes)					
4.3.2(*)	Cooperation with business enterprises and other organisations (Asterisk Criterion for educational and vocational programmes, franchise programmes)			X		
4.4	Facilities and equipment					
4.4.1*	Quantity, quality, media and IT equipment of teaching and group rooms (Asterisk Criterion)		X			
4.4.2*	Access to literature (Asterisk Criterion)		X			
4.5	Additional services					
4.5.1	Career counselling and placement service			X		
4.5.2	Alumni Activities			X		
4.6*	Financing of the study programme (Asterisk Criterion)			X		
5	**Quality assurance and documentation**					
5.1*	Quality assurance and quality development with respect to contents, processes and outcomes (Asterisk Criterion)			X		
5.2	Instruments of quality assurance					
5.2.1	Evaluation by students			X		
5.2.2	Evaluation by faculty			X		
5.2.3	External evaluation by alumni, employers and third parties			X		
5.3	Programme documentation					
5.3.1*	Programme description (Asterisk Criterion)			X		
5.3.2	Information on activities during the academic year			X		

Information

Information on the Institution

The National Economics University (NEU) was established in 1956, originally named the School of Finance and Economics. It was one of the first public universities in Vietnam to train public servants in a centrally planned economy. The University was renamed three times: University of Economics and Finance in 1958, University of Planning and Economics in 1965, and National Economics University in 1985.

Following Vietnam's *Đổi mới* reforms in 1986, which marked the shift towards a market economy and international integration, NEU became one of the country's leading institutions in economics and business. In 1989, the Government assigned the University three missions:

- To provide consultancy on macroeconomic policy;
- To deliver undergraduate and postgraduate programmes in economics and business;
- To train managers for enterprises across all economic sectors.

Currently, NEU is an autonomous public academic institution implementing its strategic development plan to achieve its vision: "*To be among the five leading multidisciplinary research universities in Vietnam and among the top 100 Asian universities in economics, management, and business administration.*"

According to its strategy, NEU's mission is:

- To pioneer in the innovation, development, and dissemination of knowledge in economics, management, and business administration, serving as a hub that attracts and nurtures talent and contributes high-quality human resources for Vietnam's sustainable development.
- To educate Vietnam's future leaders and entrepreneurs.
- To act as a distinguished research centre, formulating strategies for socio-economic development and providing consultancy to governments, non-governmental organisations, and enterprises.

As of 2025, NEU offers 105 undergraduate programmes, including 12 part-time programmes, 4 distance-learning programmes, and 89 full-time Bachelor's programmes. The full-time Bachelor programmes include

- 41 delivered in Vietnamese,
- 16 in which 30% to 50% of the courses are taught in English,
- 25 fully delivered in English,
- five advanced programmes and 24 high-quality programmes, all delivered partly in English.

At the postgraduate level, NEU offers 66 programmes, consisting of 38 Master's and 28 Doctoral programmes. The University also provides English-medium joint programmes with foreign partner universities.

<u>The College of Technology</u>

The Institute of Information Technology and Digital Economics was established on 11 January 2019 through the reorganisation of two existing units: the Faculty of Economic Informatics

(established in 2007) and the Department of Information Technology (established in 2005). The College of Technology represents one of the three strategic pillars of the National Economics University, alongside the College of Business and the College of Economics and Public Management. The College plays an important role in advancing the University's development through several key functions.

First, it leads the integration of emerging technologies, particularly Artificial Intelligence and Data Science, into economics, management, and business education. Through this integration, the College equips students across the University with the technological knowledge and skills necessary for modern business and management practices.

Second, the College expands the University's academic scope by offering technology-oriented programmes, including the training of engineers and IT professionals with strong foundations in economics and business administration. This interdisciplinary approach provides the University with a distinctive advantage compared with institutions that specialise solely in technology.

Third, the College consolidates technological resources by bringing together units with strong technological expertise. This enables the University to deliver high-quality graduates and researchers in technology fields who are also well-versed in economics, management, and business.

In addition, the College contributes to the University's transition toward a multidisciplinary institution, in alignment with the National Economics University Development Strategy for the period 2021–2030. It also promotes the use of technology in university governance, improving administrative efficiency and enabling academic staff to focus more on teaching and research.

Furthermore, the College aims to strengthen the University's academic leadership by developing a strong community of researchers in technology fields with international research contributions. These experts also support enterprises and organisations in areas such as digital transformation, smart technologies, Artificial Intelligence, Data Science, and Blockchain applications in management and business.

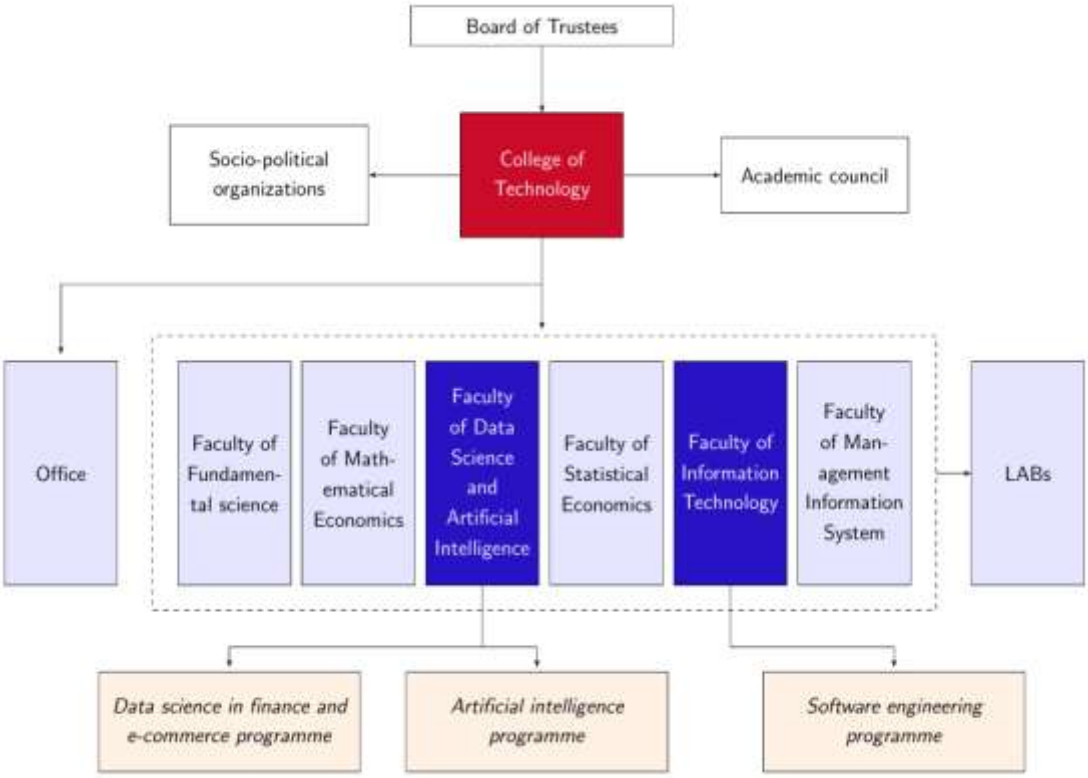
The College of Technology was established based on three core units of the National Economics University:

- Institute of Information Technology and Digital Economics
- Faculty of Mathematical Economics
- Faculty of Statistical Economics

Currently, the College comprises six academic faculties:

- Faculty of Fundamental Sciences
- Faculty of Mathematical Economics
- Faculty of Statistics
- Faculty of Management Information Systems
- Faculty of Information Technology
- Faculty of Data Science and Artificial Intelligence

The organisational structure of the College of Technology is presented below:



At the time of the SER report, the College of Technology offered 12 undergraduate programmes, including seven programmes delivered in Vietnamese and five programmes delivered entirely in English. At the postgraduate level, the College offers two programmes: one Master's programme and one Doctoral programme. In addition, the College also offers English-medium joint programmes in collaboration with international partner universities.

Faculty of Data Science and Artificial Intelligence

The Faculty of Data Science and Artificial Intelligence was established under Decision No. 389/QĐ-DHKTQD dated 9 May 2024 issued by the President of the NEU. The Faculty aims to provide high-quality human resources in Data Science and Artificial Intelligence, particularly with applications in economics, management, and business, to meet labour market demands.

The Faculty aspires to become a leading national unit in training, research, and technology transfer in data science and artificial intelligence. By 2030, it aims to rank among the top three institutions nationwide in these fields, with evaluation indicators including international publications, technology transfer outcomes, student quality, competition achievements, and graduate employment outcomes.

Since 2024, the Faculty has offered two undergraduate programmes: Data Science in Finance and E-commerce and Artificial Intelligence. In the coming years, it plans to develop additional interdisciplinary programmes related to technology and business, such as Technology in Logistics and Supply Chain Management and Industrial Management and Operations. At the postgraduate level, the Faculty plans to launch a Master's programme in Data Science and Artificial Intelligence in 2028, followed by a Doctoral programme in 2030.

Faculty of Information Technology

The Faculty of Information Technology (FIT) is responsible for teaching and research in information technology and its applications, particularly in economics, management, and business administration, across NEU. The Faculty also conducts research, consulting, and technology transfer activities for businesses and organisations, thereby strengthening the link between academia and industry.

The Faculty aims to become one of the top three institutions in Vietnam in research on Computer Science, Information Technology, and Information Security by 2030, contributing to the University's reputation and innovation capacity in the digital era.

The Faculty currently offers five undergraduate programmes:

- Computer Science (since 2005), taught in Vietnamese, with an annual intake of 60 students and approximately 800 graduates.
- Information Technology (since 2018), taught in Vietnamese, with an annual intake of 120 students and about 275 graduates.
- High-Quality Information Technology (since 2022), delivered in cooperation with the Institute of Advanced Education Programme, with an annual intake of 90 students.
- Information Security (since 2024), taught in Vietnamese, with an annual intake of 60 students.
- Software Engineering (since 2024), taught in English, with an annual intake of 80 students.

Further development of the programmes

Data Science in Finance and E-commerce

		1. Cohort	2. Cohort	3. Cohort	4. Cohort	5. Cohort	6. Cohort
# Study Places offered by HEI						90	110
# Applicants	∑	233	2113	2084	3468	4217	3454
	f	122	1153	1113	1942	2418	1978
	m	111	960	971	1526	1799	1476
Application rate						4685.56%	3140.00%
# First-Year Students *(accepted applicants)*	∑	0	0	0	0	87	104
	f					32	43
	m					55	61
Rate of female students						0.367816092	0.413461538
# Foreign Students	∑	0	0	0	0	0	0
	f					0	0
	m					0	0
Rate of foreign students						0	0

Percentage of occupied study places						96.67%	94.55%
# Graduates	∑						
	f						
	m						
Success rate *(students who finished their studies)*							
Dropout rate *(students who dropped their studies)*						*0.00%*	*0.00%*
Average duration of study							
Average grade of final degree							

Artificial Intelligence

		1. Cohort	2. Cohort	3. Cohort	4. Cohort	5. Cohort	6. Cohort
# Study Places offered by HEI		These cohorts have not yet been admitted				75	90
# Applicants	∑	0	0	0	0	4599	3518
	f				0	2445	1397
	m				0	2154	2121
Application rate						6132.00%	3908.89%
# First-Year Students *(accepted applicants)*	∑	0	0	0	0	77	91
	f					17	13
	m					60	78
Rate of female students						0.220779221	0.142857143
# Foreign Students	∑	0	0	0	0	0	0
	f					0	0
	m					0	0
Rate of foreign students						0	0

Percentage of occupied study places						102.67%	101.11%
# Graduates	∑						
	f						
	m						
Success rate ***(students who finished their studies)***							
Dropout rate ***(students who dropped their studies)***						*1.30%*	
Average duration of study							
Average grade of final degree							

Software Engineering

		1. Cohort	2. Cohort	3. Cohort	4. Cohort	5. Cohort	6. Cohort
# Study Places offered by HEI						40	80
# Applicants	∑					5468	3142
	f					2799	1189
	m					2669	1953
Application rate						13670.00%	3927.50%
# First-Year Students ***(accepted applicants)***	∑	0	0	0	0	33	73
	f					10	19
	m					23	54
Rate of female students						0.303030303	0.260273973
# Foreign Students	∑	0	0	0	0	0	0
	f					0	0
	m					0	0
Rate of foreign students						0	0

Percentage of occupied study places						82.50%	91.25%
# Graduates	∑						
	f						
	m						
Success rate *(students who finished their studies)*							
Dropout rate *(students who dropped their studies)*						3.03%	0.00%
Average duration of study							
Average grade of final degree							

Appraisal:

The Data Science in Finance and E-commerce programme shows very strong demand, with applicants increasing from 233 in the 1st cohort to over 4,000 in the 5th cohort and remaining high in the 6th cohort (3,454 applicants). With 90–110 study places, the application rate is extremely high (over 3000–4600%). The occupancy rates for study places are also high (96.67% and 94.55%). Female students account for about 37–41% of admitted students. Currently, no international students are enrolled, and no dropouts have been reported, while graduation data are not yet available because the programme is still relatively new.

The Artificial Intelligence programme shows very high demand, with 4,599 applicants for 75 places in the 5th cohort and 3,518 applicants for 90 places in the 6th cohort, resulting in extremely high application rates (6132% and 3909%). The number of admitted students slightly exceeded the planned capacity (102.67% and 101.11%). Female participation remains relatively low (22% and 14%), and no international students are enrolled. The dropout rate is low (1.3%), while graduation data are not yet available because the programme is still new.

The Software Engineering programme demonstrates very strong demand, with 5,468 applicants for 40 places in the 5th cohort and 3,142 applicants for 80 places in the 6th cohort, resulting in extremely high application rates (13,670% and 3,927.5%). The occupancy rate of study places increased from 82.5% to 91.25%. Female students account for about 30% and 26% of admitted students. No international students are currently enrolled. The dropout rate is low (3.03% in the 5th cohort and 0% in the 6th cohort), while graduation data are not yet available because the programme is still relatively new.

Programme Description and Appraisal in Detail

1. Objectives

1.1 Objectives of the study programme (Asterisk Criterion)

Data Science in Finance and E-commerce

The Bachelor's/Engineer programme in Data Science in Finance and E-commerce was promulgated under Decision No. 372/QĐ-DHKTQD dated 15 April 2024, issued by the President of the University.

The programme aims to train highly qualified data science professionals to meet the development needs of the digital economy. Graduates are expected to possess strong professional competencies, ethical standards, and the ability to design, manage, and analyse data systems. They are prepared to work in data analysis, data processing, and database management across companies, financial institutions, research institutes, and universities, and demonstrate the ability to work independently and adapt to changing environments.

The programme objectives are aligned with the National Qualifications Framework issued by the Ministry of Education and Training (MOET), which specifies the minimum knowledge and competency requirements for bachelor-level graduates. The programme primarily recruits Vietnamese high school graduates who meet the admission requirements of MOET and NEU.

Graduates may pursue careers in businesses, socio-economic organisations, government agencies, research institutes, and universities, particularly in roles related to data analysis, management, and consulting. They may also work as researchers or lecturers in fields such as applied mathematics, information technology, data science, and quantitative analysis. In addition, graduates are eligible to continue their studies at the Master's and Doctoral levels in related fields.

The programme´s objectives are stipulated below:

PO	PO Description
1	Possess knowledge and ability to develop and apply data science applications in supporting management and decision-making in economic and social organisations.
2	Have scientific research skills in the field of data science, analytical skills, systematic and critical thinking, entrepreneurship, and the ability to work independently or in a team.
3	Possess self-learning skills, good political and ethical qualities, good health, a sense of discipline and professional work ethic, a spirit of inquiry, proactive creativity, and professional responsibility.
4	Have good communication skills and be able to communicate and work with foreign experts and colleagues in English.

The programme´s learning outcomes are stipulated below:

PLO	Programme learning outcome	B*	E*
1.1	Understand the methodology of Marxism-Leninism; the policies and guidelines of the Communist Party; and Ho Chi Minh's ideology	3	3
1.2	Apply the knowledge of economics, finance, law, management, and business administration in work and life.	3	3
1.3	Understand fundamental knowledge of mathematics, statistics, and optimization theory in modeling and solving basic problems	4	4
1.4	Use programming languages/tools for data science across different operating system environments	4	4
1.5	Understand methods of data management, data organization, data transmission, data encryption/security, and visualization	3	4
1.6	Analyze basic and advanced techniques in statistics, machine learning, and optimization for data analysis and data processing	4	5
2.1	Meet the foreign language output standards (international English certificate IELTS 6.0 and equivalent)		
2.2	Apply programming languages, data analytics tools and techniques to solve specific problems in economics and business.	4	5
2.3	Have the ability to present, communicate, and convey information effectively in the workplace.	4	5
2.4	Having the ability to self-study and conduct scientific research, and to work independently or in a team.	4	5
2.5	Having the ability to analyze, synthesize, and think systematically, possess critical thinking, and entrepreneurial skills.	4	4
3.1	Demonstrate responsibility towards oneself, work, profession, and society; discipline, cooperation, creativity, and professionalism in work	5	5
3.2	Fulfill social responsibility and professional ethics in making assessments and evaluations on professional matters	5	5

B* *and* **E*** *are PLO degree for Bachelor and Engineer respectively*

Artificial Intelligence

The Bachelor's/Engineer programme in Artificial Intelligence was promulgated under Decision No. 372/QĐ-DHKTQD dated 15 April 2024, issued by the President of the University. The programme aims to equip students with specialised knowledge and competencies in artificial intelligence, preparing them to be graduates with strong ethical values, professional skills, and innovative research capabilities. Graduates are expected to develop advanced AI systems and data infrastructures that support digital transformation and optimisation across economics, business, and management. The programme is designed to meet the growing demand for high-quality human resources in artificial intelligence and information technology in both domestic and international labour markets. The programme objectives are aligned with the National Qualifications Framework issued by the MOET, which defines the knowledge and competency requirements for bachelor-level graduates.

The Programme learning outcomes are provided below:

PLO	Programme learning outcome	B*	E*
1.1	Apply the human perspective and methodology of Marxism-Leninism and the Communist Party of Vietnam to learning, research, and practical life in the development of a socialist-oriented market economy.	3	3
1.2	Apply basic knowledge of law, economics, business management, and administration to solve socio-economic problems.	3	3
1.3	Apply mathematical theories and basic scientific knowledge to learn about Computer Science and Information Technology.	4	4
1.4	Apply foundation knowledge of computer science, information technology	4	5
1.5	Apply specialized and advanced knowledge of artificial intelligence	4	5
2.1	Meet the foreign language output standards (international English certificate IELTS 6.0 and equivalent)		
2.2	Have the ability to communicate, work in teams, manage projects, be creative, think logically, and possess self-learning and research skills.	4	4
2.3	Apply skills in data preparation, analysis, training, building, modifying, and optimizing architecture, parameter tuning, and deploying AI models	4	5
2.4	Apply skills in integrating AI models to develop complete applications that solve problems in economics, business, finance, supply chain.	4	5
3.1	Work independently, demonstrate personal responsibility and responsibility to the working group	5	5
3.2	Plan, coordinate, manage resources, evaluate, and improve the effectiveness of activities	5	5
3.3	Present and defend personal viewpoints based on an objective and scientific approach and evaluations on professional matters	5	5
3.4	Identify and fulfill social responsibilities and professional ethics in making judgments and assessments on professional issues	4	4

B* *and* **E*** *are PLO degree for Bachelor and Engineer, respectively*

Graduates of the Bachelor's/Engineer programme in Artificial Intelligence can pursue careers in technology companies, public organisations, research institutes, and universities. They are prepared to contribute to digital transformation initiatives, develop AI-based software and machine learning algorithms, and support technology adoption in businesses and organisations.

Typical career positions include machine learning specialist, data processing and analysis specialist, programmer, software developer, lecturer, and researcher. Graduates may also work in digital transformation consulting, software development and distribution, and technology-related projects addressing social and organisational challenges. In addition, they may take roles related to data infrastructure development, data storage management, and technology policy planning. Graduates are also eligible to pursue postgraduate studies at the Master's and Doctoral levels in fields such as data science, artificial intelligence, and information technology.

Software Engineering

The Bachelor of Software Engineering programme was promulgated under Decision No. 372/QĐ-DHKTQD dated 15 April 2024, issued by the President of the University. The programme aims to train highly qualified software engineering professionals with strong ethical values, professional competencies, and a solid foundation in computer science and information technology, as well as a basic understanding of economics, management, and business administration. Graduates are expected to possess the knowledge and skills required for software development, system design, testing, deployment, and maintenance, while also

demonstrating the ability to engage in continuous learning, research, and responsible professional practice.

The programme objectives are aligned with the National Qualifications Framework issued by the MOET. It primarily recruits Vietnamese high school graduates who meet the admission requirements of MOET and NEU. Graduates can pursue careers in software development and information technology companies, taking on roles such as software engineer, programmer, business analyst, IT tester, and software project manager. They may also engage in research and innovation in software development, contributing to technological advancement and the development of new software methodologies.

The programme objectives are presented below:

PO	PO Description
1	Have basic knowledge of politics, society, law, and natural sciences.
2	Have a foundational knowledge of economics and specialized knowledge in the field of Computers and Information Technology
3	Have the skills to apply theoretical knowledge to analyse, synthesise, and propose solutions to specialised problems in Software Engineering.
4	Have the skills to search for and analyse information to serve the purpose of self-improvement in specialised and interdisciplinary
5	Have the skills to proficiently use a foreign language for communication and specialised purposes to support learning and work.
6	Have the ability to work independently, communicate effectively, collaborate in teams, withstand pressure, and quickly adapt to specific tasks.

The programme learning outcomes are provided below:

PLO	Programme learning outcome	Level
1.1	Apply the methodology and philosophy of Marxism-Leninism and the Communist Party of Vietnam in studying, researching	3
1.2	Apply basic knowledge of law, economics, business administration, and management to solve macroeconomics and microeconomics issues	3
1.3	Apply mathematical theories and basic scientific knowledge to the study of Computer Science and Information Technology.	4
1.4	Apply foundational knowledge of Computer Science and Information Technology	4
1.5	Apply specialized knowledge in software development to design and develop software products in management and administration.	4
2.1	Achieve foreign language proficiency level 4/6 according to the Vietnam--ese foreign language competency framework, or equivalent	4
2.2	Programming skills, understanding software development processes, databases, application development, testing, and quality assurance.	4
2.3	Apply design methods to develop software products according to customer requirements. Autonomy and Responsibility Standards	4
2.4	Possess skills in analysis, synthesis, systematic thinking, critical thinking, and entrepreneurship	4
3.1	Demonstrate self-reliance when working independently and show personal and group responsibility.	5
3.2	Plan, coordinate, manage resources, evaluate, and improve the efficiency of activities.	4
3.3	Express and defend personal viewpoints based on an objective, scientific approach.	4
3.4	Identify and fulfill social responsibilities and professional ethics in making assessments and evaluations of specialized issues.	4

Appraisal:

The qualification objectives of the programmes are explained and convincingly presented in relation to the target group, targeted professional field and societal context of the discipline. They embrace academic proficiency, comprehensive employability, and the development of the individual student's personality.

The subject-specific and extra-curricular qualification objectives and skills to be acquired correspond with the aspired level at graduation. They take into account the requirements of the national qualification framework.

The panel **suggests** considering labour market and employer needs more strongly in the curriculum to ensure that the study programmes remain relevant to current labour market demands and that graduates acquire the competencies required in professional practice. Furthermore, the panel **suggests** developing more detailed graduate profiles for each study programme.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
1.1*	Objectives of the study programme (Asterisk Criterion)			X		

1.2 International orientation of the study programme design (Asterisk Criterion)

All study programmes

For all study programmes, the respective programme objectives, PLOs, teaching plans, courses, practical activities, and the programme implementation partners with international orientation. English textbooks and other study materials for courses taught in English are used. The use of English is considered an advantage for future graduates of the programme in a competitive labour market. Graduates are expected to be proficient in English at an IELTS score of 6.0 or equivalent. In addition, many lecturers involved in the programme hold doctoral degrees from international universities and regularly participate in international conferences and professional training, ensuring that the teaching content remains up to date.

Data Science in Finance and E-commerce

The curriculum was developed with reference to internationally recognised programmes, including the Computer Science, Economics, and Data Science programme at the Massachusetts Institute of Technology, the Data Science programme at Stanford University, and the Data Science and Analytics programme at the National University of Singapore.

Artificial Intelligence

The curriculum was developed with reference to internationally recognised programmes, including the Bachelor of Artificial Intelligence at the University of Technology Sydney, the Bachelor of Science in Artificial Intelligence and Decision Making at the Massachusetts Institute of Technology, and the Bachelor of Computing in Artificial Intelligence at Nanyang Technological University.

Many course contents, particularly specialised subjects, are aligned with international professional certifications, such as IBM AI Developer, IBM AI Engineering, and IBM AI Product Manager.

Software Engineering

The programme curriculum was developed with reference to internationally recognised programmes, including the Bachelor of Software Engineering at Arizona State University, the BS in Software Engineering at Quinnipiac University, and the Bachelor of Software Engineering (Honours) at Deakin University.

Appraisal:

The programmes' design appropriately takes into account the required international aspects, with respect, too, to their graduates' employability. Although the international orientation of the study programmes is well presented, the panel noted that language barriers could adversely affect the quality of teaching and learning, as well as students' comprehension of the course content. Therefore, it is important to ensure sufficient English language proficiency among both students and lecturers. Therefore, the panel **strongly recommends** monitoring the English language proficiency of both students and lecturers and ensuring that all students can effectively follow and understand the lecture content and that lecturers can deliver the content properly in English. Furthermore, the panel encourages the HEI to provide English language support, if needed.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
1.2*	International orientation of the study programme design (Asterisk Criterion)			X		

1.3 Positioning of the study programme

Positioning of the study programme on the educational market

Data Science in Finance and E-commerce

At the time the Data Science in Finance and E-commerce programme was launched in 2024, more than 10 universities and institutes in Vietnam were already offering data science programmes. Notable institutions include the University of Science – Vietnam National University, Hanoi; the University of Science – Vietnam National University, Ho Chi Minh City; the University of Engineering and Technology – Vietnam National University, Hanoi; Ho Chi Minh City University of Technology; and the University of Economics, Ho Chi Minh City. The establishment of this programme was intended to meet the growing demand for data science professionals, particularly in the finance and e-commerce sectors. A distinctive feature of the programme is its integration of data science with applications in economics, finance, business, and e-commerce, an approach that was relatively uncommon in Vietnam at the time of its introduction. As a result, graduates are expected to possess both technical competencies in data science and domain knowledge in economics and business, enabling them to pursue careers in applied data science within these sectors.

Artificial Intelligence

At the time the Artificial Intelligence programme was launched in 2024, several universities in Vietnam had already introduced bachelor's programmes in artificial intelligence, including the University of Science and Technology of Hanoi, Ho Chi Minh City University of Technology, University of Engineering and Technology – Vietnam National University, Hanoi, Ho Chi Minh City University of Technology and Education, and FPT University. The establishment of the programme at NEU aims to address the growing demand for artificial intelligence professionals. A distinctive feature of the programme is its integration of artificial intelligence with applications in economics and business. Graduates are expected to possess not only technical knowledge in AI but also a solid understanding of economics, business management, finance, banking, insurance, logistics, and supply chain management, enabling them to apply AI solutions effectively in these domains.

Software Engineering

At the time the Software Engineering programme was launched in 2024, more than ten universities in Vietnam were offering programmes in software engineering or information technology, including the University of Science – Vietnam National University, Hanoi, University of Science – Vietnam National University, Ho Chi Minh City, University of Engineering and Technology – Vietnam National University, Hanoi, Ho Chi Minh City University of Technology, and the University of Economics Ho Chi Minh City. The establishment of this programme aims to address the growing demand for software engineering professionals. A distinctive feature of the programme is its integration of software engineering and information technology with applications in economics and business. Graduates are expected to possess not only technical competencies in software development but also knowledge of economics, business, banking, finance, and accounting, enabling them to apply software solutions effectively in these domains.

All study programmes

The programmes are delivered primarily in English, supporting students in developing the language skills necessary for working in international environments. According to SER, compared with similar programmes offered by other institutions, the programmes have several advantages. First, it is a full-time undergraduate programme offered by NEU, a prestigious Vietnamese university with strong expertise in economics and business. Second, English-medium instruction enables students to integrate more easily into international academic and professional environments. Finally, the programmes benefit from strong industry connections, providing students with internship opportunities and improving their employment prospects after graduation.

Positioning of the study programme on the job market for graduates ("Employability")

Data Science in Finance and E-commerce

Data science has emerged as an important field in Vietnam amid the Fourth Industrial Revolution (Industry 4.0). Many organisations increasingly rely on data-driven decision-making and digital transformation to improve business performance, leading to a growing demand for data science professionals. To support the development of the Data Science in Finance and E-commerce programme, the Faculty of Data Science and Artificial Intelligence conducted a job-market and stakeholder-needs analysis. Surveys were administered to several stakeholder groups, including over 1,000 high school students from more than 100 schools in Hanoi and neighbouring provinces; employers from technology companies and financial institutions;

professionals working in data science-related fields; and NEU alumni. In addition, a seminar on human resource demand in data science was organised on 24 January 2024, with the participation of industry representatives, researchers, and academic institutions. The discussions highlighted several key findings. First, data science is a core technological field with a significant impact on economics, business, finance, and e-commerce. Second, there is a rapidly increasing demand for data science professionals, while the current supply remains insufficient. Third, effective training in this field requires integrating mathematics and statistics, computer science, and knowledge of economics, business, finance, and e-commerce.

Artificial Intelligence

In the context of international integration and the Fourth Industrial Revolution (Industry 4.0), Vietnam has identified artificial intelligence as a key technology for national development in the coming decade. Since 2014, the Vietnamese Government has prioritised AI as a strategic technology for research and investment. Several national initiatives have been implemented, including the National Key Science and Technology Program on Industry 4.0 technologies, as well as the establishment of the National Innovation Centre to promote innovation, technology development, and startup investment.

Major Vietnamese technology corporations, such as Viettel, FPT, Vingroup, and VNPT, have also made significant investments in AI research and applications across natural language processing, computer vision, robotics, data analytics, healthcare, and digital services. In addition, the formation of the Vietnam AI Community Alliance and other professional networks reflects the rapid development of Vietnam's AI ecosystem. To support the development of the Artificial Intelligence programme, the Faculty of Data Science and Artificial Intelligence conducted a job market and stakeholder needs analysis. Surveys were administered to multiple groups, including more than 1,000 high school students from over 100 schools in Hanoi and neighbouring provinces; employers from technology companies; industry professionals and researchers; and NEU alumni.

Furthermore, a seminar on AI human resource demand was organised on 24 January 2024, with participation from industry representatives, researchers, and academic institutions. Key conclusions from the discussions included the rapidly growing demand for AI professionals in Vietnam, the current shortage of qualified human resources, and the importance of integrating technical AI knowledge with economics and business expertise to better prepare graduates for real-world applications. Participants also emphasised the value of English-medium instruction and industry collaboration, particularly in providing internships and employment opportunities.

Software Engineering

The software engineering industry in Vietnam has experienced significant growth, with the country becoming an attractive destination for global software outsourcing projects due to its competitive labour costs and high-quality workforce. This development has created numerous employment opportunities and stimulated innovation within the technology sector. The introduction of the Software Engineering programme aligns with the Government’s national digital transformation strategy to 2025 with a vision toward 2030 (Decision No. 749/QĐ-TT dated 3 June 2020) and supports the country’s socio-economic development goals.

Vietnam’s startup ecosystem has also grown rapidly, particularly in the software and digital technology sectors. Government policies encourage innovation and entrepreneurship through financial support, favourable regulations, and initiatives such as incubators, co-working

spaces, and digital technology development programs. These policies create favourable conditions for software companies and professionals to develop new products and services.

To support the development of the Software Engineering programme, the Faculty of Information Technology conducted a needs analysis and stakeholder consultation. Surveys were conducted with over 1,000 high school students from more than 100 schools in Hanoi and neighbouring provinces, employers from technology companies, IT professionals and researchers, and NEU alumni. In addition, a seminar on human resource demand in software engineering was held on 24 January 2024, with participation from industry representatives, researchers, and academic institutions. The discussions highlighted the rapid growth of the IT industry, the shortage of well-trained software engineering professionals, and the importance of equipping graduates with essential competencies, including programming, systems analysis and design, project management, software testing and quality assurance, user interface design, and version control.

Positioning of the study programme within the HEI's overall strategic concept

Data Science in Finance and E-commerce

The Data Science in Finance and E-commerce programme aligns with NEU's vision, mission, and development strategy. As a leading national university, NEU prioritises the development of technology-related fields, particularly digital transformation and the application of data science and artificial intelligence in economics, management, and business administration. The Faculty of Data Science and Artificial Intelligence plays a central role in implementing this strategy. The Faculty comprises highly qualified lecturers with extensive experience in teaching and research, as well as in participating in various scientific projects related to data science and artificial intelligence.

Artificial Intelligence

As a national key university, the NEU prioritises the development of information technology, digital transformation, and the application of Data Science and Artificial Intelligence in economics, management, and business administration. NEU’s mission is to provide high-quality education, research, consulting, and technology transfer that meets regional and international standards, thereby contributing to the country’s industrialisation and modernisation in the context of global integration.

The Faculty of Data Science and Artificial Intelligence plays an important role in this strategy. The Faculty has a team of highly qualified lecturers with extensive teaching and research experience and involvement in numerous scientific research projects. It also maintains collaborative partnerships with enterprises and government agencies. In response to the growing demand for highly skilled AI professionals and the practical needs of the labour market, the Faculty proposed establishing the undergraduate Artificial Intelligence programme. The programme aligns with NEU’s strategic goals by addressing the growing demand for AI expertise and enhancing professional competencies and career opportunities. In addition, the programme contributes to developing a community of lecturers, researchers, and experts in AI, strengthening international cooperation with universities, research institutes, and enterprises worldwide, and further enhancing NEU’s academic reputation in the field.

Software Engineering

NEU's mission is to provide high-quality education, research, consulting, application, and technology transfer that meet regional and international standards, thereby contributing to the country's industrialisation and modernisation in the context of global economic integration. The Faculty of Information Technology, which manages programmes related to Information Technology and Computer Science, has a team of highly qualified lecturers with extensive teaching and research experience. The Faculty has also participated in numerous research projects and maintains collaborative partnerships with enterprises and government agencies, including FPT Group, Viettel, Vingroup, the Ministry of Information and Communications, and the Ministry of Science and Technology.

Based on both domestic and international experience in software engineering education and the growing demand for skilled software engineers, the Faculty of Information Technology, in collaboration with other faculties, proposed establishing the undergraduate Software Engineering programme. The programme aligns with NEU's strategic objectives by addressing labour market demand, enhancing professional competencies and career opportunities, supporting research and technology transfer in software engineering, developing a community of experts and researchers, and strengthening international cooperation with universities, research institutes, and technology companies worldwide.

Appraisal:

The reasons given for positioning the three study programmes in the educational market are plausible. However, the panel noted that the programmes could be further strengthened in their positioning. Thus, for the **Artificial Intelligence** study programme, the panel **suggests** taking greater account of recent international developments in the field to enhance the programme's distinctiveness and competitiveness in the educational market. The panel view is that this would be beneficial, as it helps ensure that the programme remains aligned with global trends and advancements in Artificial Intelligence, thereby increasing its attractiveness to prospective students. Although the **Data Science in Finance and E-commerce** study programme claims that graduates will have in-depth knowledge of business, the panel observed that most business-related subjects are currently offered only as elective courses. This may limit the extent to which all students systematically develop the intended level of business knowledge. Thus, the panel **recommends** strengthening the business profile to make it more coherent and clearly articulated. The panel also noted that, in analysing the educational market in Vietnam, not all relevant study programmes were considered. Some programmes appear to have been overlooked due to different programme titles, although their content is related. Thus, for the **Software Engineering** study programme, the panel **recommends** that by analysing the educational market, also considering software engineering-related degree programmes with names such as Information Science and Technology provided by other HEIs in Vietnam.

The reasons given for positioning Artificial Intelligence and Data Science in Finance and E-commerce study programmes in the job market are plausible. However, for the **Software Engineering** study programme, the panel was not fully convinced by the reasons provided. Therefore, the panel **recommends** considering the impact of Artificial Intelligence (e.g., the evolving role of software engineers) and taking into account emerging market requirements in future analyses of employers and the job market.

The study programmes are convincingly integrated into the NEU’s overall strategic concept.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
1.3	Positioning of the study programme					
1.3.1	Positioning of the study programme in the educational market			X		
1.3.2	Positioning of the study programme on the job market for graduates (“Employability”)			DS, AI	SE	
1.3.3	Positioning of the study programme within the HEI's overall strategic concept			X		

2. Admission

NEU's admission requirements are developed in accordance with the regulations of the Ministry of Education and Training (MOET) and comply with the national legal framework governing higher education admissions.

All requirements and procedures are formally described and documented in NEU's official Admission Regulations and Admissions Schemes, which are publicly announced before the beginning of each admission cycle. These documents specify the eligibility criteria, entry thresholds, required qualifications, and the process of application, selection, and enrolment. Admissions methods and criteria are defined and revised annually to review the effectiveness of admissions. The Admissions Schemes include information about NEU's mission, training scale, enrolment information, enrolment time, quality assurance conditions, students' employment situation, and statistics on the number of enrolments and enrolment scores in previous years. The database of annual enrolment results is used to self-research for future enrolment.

Every year, NEU updates documents to guide MOET enrolment changes and provide appropriate methods and admission criteria. Information on the policy is published and updated in the newsletter of annual college admission, NEU's website, the school's or faculty's website, social media site, a document of NEU's annual admission consultancy and other online magazines

Applicants can include persons who have been awarded a Vietnamese Upper Secondary Education (High School) Graduation Diploma, or a foreign qualification recognised as equivalent or persons who hold an intermediate vocational diploma in a field within the same major group as the one applied for, and who have fulfilled the required upper-secondary academic knowledge as prescribed by law.

Applicants must also satisfy the following conditions:
a) Meet the entry threshold;
b) Be medically fit for study in accordance with current rules;
c) Provide complete personal information and an application dossier as required.

For applicants with disabilities that impair learning capacity who wish to register for admission, the University, to the extent possible, shall consider admitting them to suitable majors consistent with their health conditions.

Counselling for prospective students
From March to September, NEU organises admission consulting sessions on the University campus as well as at some high schools in Hanoi and other provinces at the University level. Additionally, NEU organises annual admission events on the University campus for applicants.

Candidates can contact the admissions department by phone at the number listed on the flyers and enrollment content. Candidates can visit the University through the programs "One day as a NEU student" or "Enrolment Counselling Day" organised by NEU for 12th-grade students from high schools. These days, visitors can access facilities such as classrooms, libraries, conference halls, and football fields.

At the programme level, in addition to participating in the university's general admissions and counselling activities, programmes conduct several promotional and advisory activities. These include the development of programme-specific brochures presenting key information such as tuition fees, curriculum structure, career opportunities, and admission procedures. Programme information and promotional materials are also regularly updated and disseminated through the university website, social media platforms, and press channels.

To provide more direct support to prospective students, the faculties maintain a dedicated admissions counselling team available during working hours at designated offices within the Faculty of Data Science and Artificial Intelligence and the Faculty of Information Technology.

Counselling activities are conducted through multiple communication channels tailored to different target groups. For example, Facebook, Zalo, and email are commonly used to reach high school students, while face-to-face meetings, phone calls, hotlines, and official websites are used to communicate with parents. The counselling team provides detailed information on study programmes, tuition fees, admission procedures, and career opportunities.

Selection procedure
Based on MOET's overall plan for selection for full-time programmes, the University coordinates to implement the following steps:

Step 1: Registration
Applicants register via MOET's Admission Portal or the National Public Service Portal. Selections are conducted at the University using applicable methods: direct selection or combined selection based on upper-secondary exam results, academic records, or other assessments.

Step 2. Virtual filtering
The University carries out selection according to its own admission methods and criteria, or may collaborate with other institutions under a shared plan. MOET provides guidance on the schedule and supports the processing of preferences. After the preference-registration period ends, the University downloads data including registered preferences, academic records, exam results, graduation scores, results of exams organised by higher-education institutions, and applicants' area-based and policy-category priority data.

Principles of selection:

- Cutoff scores are set so admitted candidates match the quota, but not below the entry threshold.
- For each programme/major/group, applicants are considered equally based on scores and converted cutoffs, regardless of preference order, except as specified in Admission Regulations (2025).
- Priority points must align with the levels set out in Admission Regulations (2025).

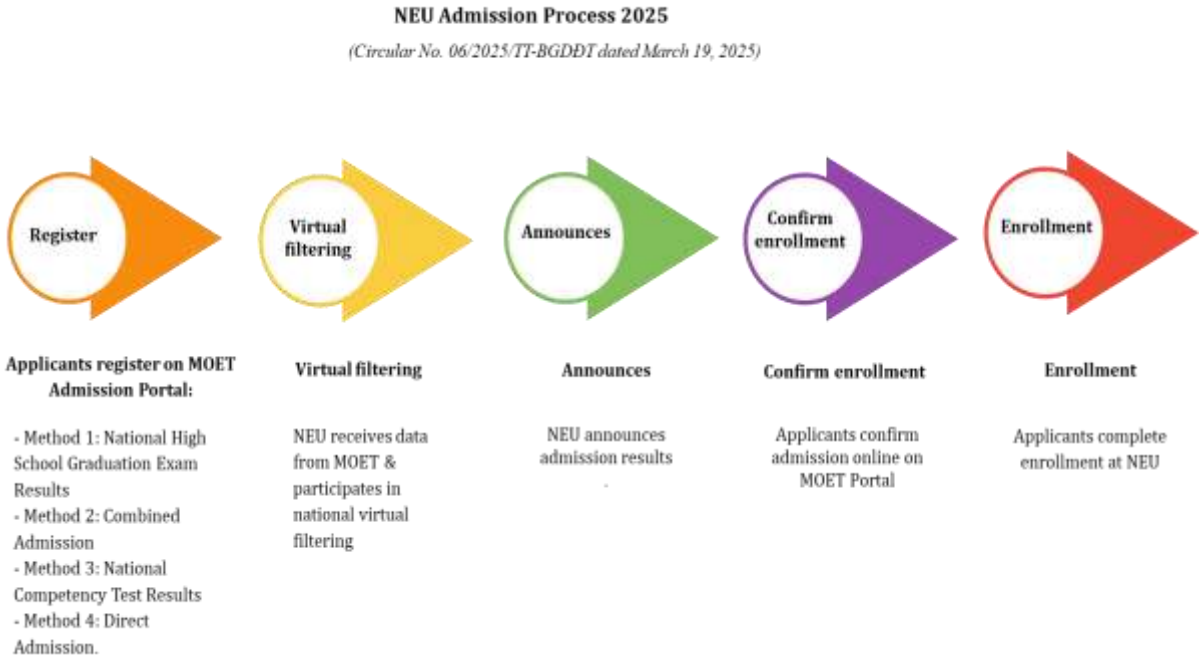
After each cycle, the University uploads a list of candidates projected to be admitted. The system automatically removes lower-ranked preferences for candidates eligible under multiple options, retaining their highest-ranked preference.

The University repeats selection in subsequent cycles, adjusting cutoff scores to meet quotas. In the final cycle, official cutoff scores are set, and the final list of admitted candidates is uploaded.

Step 3. Announcement
The University announces cutoff scores (and any additional conditions or tie-breaking criteria, if applicable) for each programme/major by admission method. Applicants can check their results on the University's portal or on the portal of a consortium/group conducting joint selection.

Step 4. Confirmation of enrolment
The University issues admission notices detailing procedures and the mode of enrolment. Candidates confirm enrolment online before completing on-site procedures. Once confirmed, candidates may not apply for admission to other institutions or participate in additional rounds unless approved by the University.

Step 5. Enrolment
On enrolment, students must submit their admission documents, pay tuition fees, confirm their personal and academic information, and attend orientation activities.



Ensuring foreign language proficiency (Asterisk Criterion)

To ensure fairness and equal access for all candidates, foreign language proficiency is not used as an admission criterion. After enrollment, the University administers an English proficiency placement test to assess students' language levels. Based on the results, appropriate English language support courses are provided. Students who meet the required English proficiency standards may proceed with their specialised courses according to the standard programme schedule.

Transparency and documentation of admission procedure and decision (Asterisk Criterion)

NEU aims at transparency and accessibility by making all admission-related information publicly available through multiple channels, including the University's official website, admission brochures, and guidance documents issued by the Admissions Office. Interested parties can access these materials, which include instructions on the application process, required documents, deadlines, and selection criteria.

For the candidates:

- In terms of providing information: Each interested candidate is provided with complete, clear, reliable, consistent and timely information to make suitable decisions and best prepare for application;
- In terms of application opportunity: No candidate loses the opportunity to apply due to regulations unrelated to qualifications and capacity, troubles caused by or prohibitive costs paid for application;
- In terms of capacity assessment: Candidates are assessed objectively, fairly and reliably with regard to their learning ability and prospects for success, meeting the requirements of the training programme and discipline;
- In terms of commitment fulfilment: The University fulfils its commitments to candidates; advises, supports, and resolves complaints, and protects the legitimate interests of candidates in risky cases.

For the public:

- Regarding information transparency: The University is responsible for timely publishing full and clear admission information via suitable media for the joint supervision of society and state management agencies;
- Regarding accountability: The University is responsible for reporting at the request of state management agencies and accounting for major pressing issues of public concern in an appropriate manner.

Admission requirements and admission-related information are publicly available here: https://daotao.neu.edu.vn/vi/tuyen-sinh-dai-hoc-chinh-quy.

Appraisal:

The admission requirements are defined and comprehensible. The national requirements are presented and taken into account.

Applicants can directly turn to a student counselling service, or to whatever other helpdesk at NEU, for clarification of specific questions, of personal aptitude, or of career perspectives. Personal dialogue between applicants and NEU is provided by defined office hours, by telephone and via e-mail.

The selection procedure (including an entrance examination) is transparent and ensures that qualified students are admitted. The admission requirements ensure that students are able to successfully complete the study programme. The panel **observed** that there is a high number of female applicants, but a relatively low number of female students enrolled in the programmes.

See condition 4 issued by the FIBAA Accreditation and Certification Committed above:
The panel noted that some students might have difficulties fully following the lecture content in English or actively participating in class. Thus, the panel **recommends** considering the implementation of an English language proficiency test as an admission requirement in order to ensure that students are sufficiently prepared to study in English. The panel **strongly recommends** considering the provision of preparatory intensive courses (such as English boot camps or supplementary English courses) for students who do not meet the required IELTS requirements, in order to support their academic pathway and facilitate successful participation in the study programmes. This would ensure that students have sufficient language proficiency to understand lectures smoothly, participate in discussions, and complete academic assignments in English, as well as help ensure that students are at a similar language level.

The admission procedure is described, documented, and accessible for interested parties. The admission decision is based on transparent criteria and is communicated in writing. In addition, the admission decision contains detailed information on the results of the admission procedure.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
2.1*	Admission requirements (Asterisk Criterion)			X		
2.2	Counselling for prospective students			X		
2.3*	Selection procedure (if relevant)			X		
2.4(*)	Professional experience (if relevant; Asterisk Criterion for master programmes that require professional experience)					X
2.5*	Ensuring foreign language proficiency (Asterisk Criterion)				**Condition**	
2.6*	Transparency and documentation of admission procedure and decision (Asterisk Criterion)		X			

3. Contents, structure and didactical concept of the programme

3.1 Contents

Logic and conceptual coherence (Asterisk Criterion)

Data Science in Finance and E-commerce

The Data Science in Finance and E-commerce programme aims to equip students with knowledge of data science, along with the foundational knowledge, skills, and professional competencies required to meet employer demands. To obtain the Bachelor's degree, students must complete 130 Vietnamese credit points (CPs), including 30 elective CPs. To obtain the Engineer's degree, students are required to complete 150 CPs, including 39 elective CPs. As part of the programme requirements, students must complete at least one internship in a company (3 CPs). In the final semester, students are also required to complete a graduation thesis (7 CPs) under the supervision of a full-time lecturer, an industry expert, or both.

The curriculum overview is provided in Annex 1.

Artificial Intelligence

The Artificial Intelligence programme is designed to equip students with specialised knowledge in Artificial Intelligence and Computer Science, as well as the foundational knowledge, skills, and professional competencies that employers require. To obtain the Bachelor's degree, students must complete 130 Vietnamese credit points (CPs), including 30 elective credits, while the Engineer's degree requires 150 CPs, including 39 elective credits. In the final semester, students must complete a graduation thesis (10 CPs) under the supervision of a full-time lecturer or an industry expert.

The curriculum overview is provided in Annex 2.

Software Engineering

The Software Engineering programme aims to equip students with strong ethical values, professional competencies, and a solid foundation in computer science and information technology, as well as basic knowledge of economics, management, and business administration. Students must complete 130 Vietnamese credit points (CPs) to obtain the Bachelor's degree, including 30 elective credits. As part of the programme requirements, students must complete a practical training course (4 CPs) in the fifth semester. In the final semester, they are required to complete a graduation thesis (10 CPs) under the supervision of a full-time lecturer, an industry expert, or both.

The curriculum overview is provided in Annex 3.

Rationale for degree and programme name (Asterisk Criterion)

Data Science in Finance and E-commerce

The programme title, "Data Science in Finance and E-commerce," is consistent with the curriculum content and programme objectives. Upon graduation, students who meet the programme requirements are awarded either:

- Bachelor's Degree in Data Science in Finance and E-commerce, or
- Engineer's Degree in Data Science in Finance and E-commerce, depending on the credit requirements, completed.

The programme name reflects its primary objective: training highly qualified data science professionals to meet the needs of the digital economy, particularly in finance and e-commerce. Graduates are expected to possess strong analytical and technical skills, professional and ethical qualities, and the ability to design and manage data systems, perform data analysis, and apply data-driven solutions in companies, financial institutions, research institutes, and universities.

Artificial Intelligence

The programme title, "Artificial Intelligence," is consistent with the curriculum content and programme objectives. Upon graduation, students who meet the programme requirements are awarded either:

- Bachelor's Degree in Artificial Intelligence, or
- Engineer's Degree in Artificial Intelligence, depending on the credit requirements, completed.

The programme name reflects its primary objective of equipping students with specialised knowledge in artificial intelligence.

Software Engineering

Upon graduation, students who meet the programme requirements are awarded the Bachelor's Degree in Software Engineering. The programme name reflects its primary objective of training highly qualified professionals in software engineering.

Integration of theory and practice (Asterisk Criterion)

Data Science in Finance and E-commerce

The curriculum integrates theoretical knowledge with practical application. While theoretical foundations are taught rigorously, they are consistently linked to real-world applications. For example, courses such as Probability Theory and Mathematical Statistics include significant simulation and programming components, while subjects such as Mathematics for Data Science and Artificial Intelligence and Tools and Techniques for Business Analytics are designed to connect theory with practice. Many courses require students to complete practical assignments and group projects involving numerical computation, programming, and data analysis tasks that reflect real-world work performed by data scientists and data engineers. For example, theoretical courses such as Probability Theory and Mathematics for Data Science and Artificial Intelligence include significant components of simulation and programming. Other courses, such as Data-driven Marketing, Tools and Techniques for Business Analytics, and AI in Tourism and Leisure, are specifically designed to connect theory with practical applications.

Artificial Intelligence

Most courses require students to complete practical assignments and group projects involving numerical computation, programming, and tasks similar to those performed by AI engineers or

AI product managers. Certain specialised courses, such as Big Data Technology and Reinforcement Learning and Applications, are delivered by instructors with industry expertise.

Software Engineering
Core theoretical courses such as Calculus, Principles of Database Systems, and Data Structures and Algorithms include programming components, while applied courses such as Business Analysis, Data Analysis Programming, System Analysis and Design, and Software and Database Security use practical examples and case studies related to business and industry contexts. Many courses require assignments and group projects involving programming, computational tasks, and real-world problem solving similar to those encountered by software developers, software architects, and project managers.

Interdisciplinary thinking

The Data Science in Finance and E-commerce integrates knowledge from Mathematics, Statistics, Economics, Business, Finance, E-commerce, Informatics, and Data Science. In addition, students complete compulsory courses in political studies and fundamentals of law, in accordance with national higher education requirements.

The Artificial Intelligence programme integrates knowledge from Mathematics, Probability, Informatics, Data Analytics, and Artificial Intelligence. In addition, students are required to complete compulsory courses in political studies and fundamentals of law, in accordance with national higher education regulations.

The Software Engineering programme also includes courses beyond the core field of software engineering, such as Microeconomics and Macroeconomics, to provide students with a broader understanding of the economic and business environment. In addition, students may select elective courses in areas such as business management and the applications of artificial intelligence in business and management. The curriculum also incorporates general education subjects, including Algebra, Marxist-Leninist Philosophy, and General Law, in accordance with national higher education requirements.

Furthermore, students in all study programmes are encouraged to audit courses offered by other faculties, thereby broadening their academic perspectives.

Ethical aspects

Students are required to adhere to academic integrity standards when submitting coursework, including proper attribution of other authors' ideas and sources. To prevent plagiarism, all assignments are submitted through the Turnitin system, and only submissions with a similarity index of 20% or lower are accepted.

In addition, in several courses of the Software Engineering programme, lecturers also check for similarities in code to ensure academic integrity. At the same time, students are encouraged to use open-source resources responsibly and share their code publicly, for example, through platforms such as GitHub, allowing others to review and learn from their implementations. Through these practices, students are encouraged to demonstrate responsibility and contribute positively to the broader IT community.

Methods and scientific practice (Asterisk Criterion)

Data Science in Finance and E-commerce

Students in the Data Science in Finance and E-commerce programme are trained in scientific methods, problem-solving, and investigative approaches throughout their studies. In the first year, students develop foundational knowledge and problem-solving skills through fundamental courses such as Mathematics and Probability. In the second year, they acquire domain knowledge in areas such as Economics and Statistics, as well as analytical tools and methodologies through courses such as Mathematics for Data Science and Artificial Intelligence and Data Structures and Algorithms in Python. In the third and fourth years, students further develop research and analytical competencies through advanced subjects such as Numerical Methods for Data Science, Tools and Techniques for Business Analytics, and Algorithm Design.

Artificial Intelligence

In the first year, students build foundational knowledge and problem-solving skills through courses such as Algebra, Calculus, Discrete Mathematics, Probability, and Statistics. In the second year, they acquire core disciplinary knowledge through subjects such as Introduction to Artificial Intelligence and Data Structures and Algorithms in Python, while also developing analytical methodologies through courses such as Mathematics for Data Science and Artificial Intelligence. In the third and fourth years, students further develop research and advanced analytical competencies through subjects such as Reinforcement Learning and Applications, Tools and Techniques for Business Analytics, and Software Engineering.

Software Engineering

In the first year, students develop foundational knowledge and problem-solving skills through courses such as Algebra, Discrete Mathematics, Probability and Statistics, Introduction to Information Technology, Principles of Programming, and Principles of Database Systems. In the second year, they acquire core disciplinary knowledge through subjects including Calculus, Object-Oriented Programming, Data Structures and Algorithms, Operating Systems, Software Design and Architecture, Information Technology Project Management, Web Design and Programming, and Java Programming. In the third and fourth years, students further develop advanced analytical and research competencies through courses such as Applications of AI in Business and Management, Parallel and Distributed Programming, Game and Application Programming, Business Analytics, and Software Engineering.

Examination and final thesis (Asterisk Criterion)

Student performance in each course is evaluated by the lecturer in charge in accordance with regulations clearly specified in the course Learning Guide.

To successfully complete a course, students must attend at least 80% of class sessions and obtain a minimum overall score of 4.5 out of 10. The final course grade is calculated as a weighted average, typically consisting of class participation (10%), midterm examination (40%), and final examination (50%).

Final examinations are marked anonymously, with student identification removed to ensure fairness. The marking scheme is clearly stated in the exam, enabling transparency in the evaluation process. Students who fail a course are required to retake it, while make-up examinations are permitted only in cases such as documented illness.

For the graduation thesis, students must defend their work orally before an examination committee, usually consisting of three lecturers. The thesis is assessed based on both the quality of the final report and the student's performance during the research process, and a minimum score of 5 out of 10 is required to pass the defence.

The final thesis is evaluated according to clearly defined criteria, regulations, and procedures, which are published on the Faculty's website and communicated to students at the beginning of the thesis period. The guidelines include information on the required thesis format and structure, the requirements for each component, and the evaluation criteria for the thesis as a whole. In addition, students are informed of the regulations governing the thesis process, including the timeline for completion, the frequency of meetings with supervisors, and requirements regarding academic integrity and ethical conduct.

Appraisal:

The curricula adequately reflect the qualification objectives of the study programmes. The contents of the courses are well-balanced, logically connected and oriented towards the intended learning outcomes. The areas of specialisation and optional electives enable students to acquire additional competencies and skills. However, the panel sees opportunities for further improvement.

It is not clearly justified why the courses Linux Operating System, Network Communication, and Cloud Computing are included as compulsory components of the **Data Science in Finance and E-commerce** curriculum. The panel therefore **recommends** reconsidering their status and evaluating the possibility of replacing them with compulsory courses such as Marketing and Introduction to Business, to better align the programme with its business-oriented focus.

Regarding Artificial Intelligence, the panel recommends including Information Security and Cloud Computing as compulsory courses in the curriculum and considering making the internship a compulsory component of the programme. In addition, the panel **suggests** considering the inclusion of AI courses not only within Tourism and Leisure but also expanding AI use across other disciplines, such as Business, Finance, and Management.

For the **Software Engineering** study programme, the panel **recommends** strengthening the curriculum by including advanced programming courses, such as Functional Programming and Sustainable Software Engineering. In addition, the panel **recommends** including development tools with generative AI in the curriculum.

The degrees and programme names correspond to the contents of the respective curricula and the programme objectives.

All three programmes address and explain theoretical questions through practical examples. However, the panel sees room for improvement in Data Science in Finance and E-commerce and **recommends** including a project as a compulsory component of the programme.

All three programmes communicate ethical implications for job-related ways of thinking and acting appropriately. However, for **all study progarmmes** the panel also **recommends** further integrating ethical, environmental, and societal considerations into the programmes. This will enhance students' awareness of the broader impacts of technology and their professional responsibilities.

Students do not acquire methodological competencies and are not equipped to conduct scientific work at the required level. Thus, the panel recommends the following condition:

The University incorporates scientific methods into the curriculum to support the development of students' research and analytical skills.

All exams, as they are defined for the courses, are suited in format and content to ascertain the intended learning outcomes. The requirements align with the desired qualification level. The exams are characterised by a wide variety of test formats. The final theses are evaluated based on previously published and coherently applied criteria, rules, and procedures.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
3.1	Contents					
3.1.1*	Logic and conceptual coherence (Asterisk Criterion)			X		
3.1.2*	Rationale for degree and programme name (Asterisk Criterion)			X		
3.1.3*	Integration of theory and practice (Asterisk Criterion)			X		
3.1.4	Interdisciplinary thinking			X		
3.1.5	Ethical aspects			X		
3.1.6*	Methods and scientific practice (Asterisk Criterion)				**Condition**	
3.1.7*	Examination and final thesis (Asterisk Criterion)			X		

3.2 Structure

Modular structure of the study programme (Asterisk Criterion)

Data Science in Finance and E-commerce

Projected study time	4 years / 8 semesters
Number of Credit Points (CP)	130 CPs / 205.4 ECTS credits
Workload per CP	1 CP is equivalent to 1.58 ECTS credits One ECTS credit is equivalent to approximately 31.65 standard hours / One Vietnamese credit is equivalent to approximately 50 standard hours.
Number of courses	Bachelor Degree: 27 courses Engineer's Degree: 29 courses

Time required for processing the graduation thesis and awarded CP	7 CP / 11 ECTS credits
Number of contact hours	Each academic year consists of 02 or 03 main semesters, with a total of at least 30 weeks of instruction.

The programme duration is four years for the Bachelor's degree, requiring the completion of 130 CPs, and four and a half years for the Engineer's degree, requiring 150 CPs. The curriculum is structured into five components.

Bachelor's Degree (130 CPs):

- Foundation units: compulsory courses required by the Ministry of Education and Training (MOET) and National Economics University (NEU), as well as general disciplinary courses (47 CPs).
- Major base units: compulsory courses forming the foundation of the major (10 CPs).
- Major compulsory units: core courses of the programme (33 CPs).
- Specialised units: elective courses in field knowledge and specialised knowledge (30 CPs).
- Internship report and graduation thesis (10 CPs).

Engineer's Degree (150 CPs):

- Foundation units: compulsory courses required by MOET and NEU, together with general disciplinary courses (47 CPs).
- Major base units: compulsory foundational courses of the major (10 CPs).
- Major compulsory units: core programme courses (44 CPs).
- Specialised units: elective courses in field knowledge and specialised knowledge (39 CPs).
- Internship report and graduation thesis (10 CPs).

Artificial Intelligence

Projected study time	4 years / 8 semesters
Number of Credit Points (CP)	130 CPs / 205.4 ECTS credits
Workload per CP	1 CP is equivalent to 1.58 ECTS credits One ECTS credit is equivalent to approximately 31.65 standard hours / One Vietnamese credit is equivalent to approximately 50 standard hours.
Number of courses	Bachelor Degree: 27 courses Engineer's Degree: 29 courses
Time required for processing the Internship Final Report and awarded CP	10 CPs / 16 ECTS credits

Number of contact hours	Each academic year consists of 02 or 03 main semesters, with a total of at least 30 weeks of instruction.

The programme duration is four years for the Bachelor's degree, requiring the completion of 130 CPs, and four and a half years for the Engineer's degree, requiring 150 CPs. The curriculum is structured into five components.

Bachelor's Degree (130 CPs):

- Foundation units – compulsory courses required by the Ministry of Education and Training (MOET) and National Economics University (NEU), together with general disciplinary courses (47 CPs).
- Major base units – compulsory courses forming the foundational knowledge of the major (12 CPs).
- Major compulsory units – core courses of the programme (27 CPs).
- Specialised units – elective courses covering field knowledge and specialised knowledge (30 CPs).
- Project and graduation thesis (14 CPs).

Engineer's Degree (150 CPs):

- Foundation units – compulsory courses required by MOET and NEU, together with general disciplinary courses (47 CPs).
- Major base units – compulsory foundational courses of the major (12 CPs).
- Major compulsory units – core programme courses (27 CPs).
- Specialised units – elective courses in field knowledge and specialised knowledge (50 CPs).
- Internship report and graduation thesis (14 CPs).

Software Engineering

Projected study time	4 years / 8 semesters
Number of Credit Points (CP)	130 CPs / 205.4 ECTS credits
Workload per CP	1 CP is equivalent to 1.58 ECTS credits One ECTS credit is equivalent to approximately 31.65 standard hours / One Vietnamese credit is equivalent to approximately 50 standard hours.
Number of courses	27 courses
Time required for processing the Internship Final Report and awarded CP	10 CP / 16 ECTS credits
Number of contact hours	Each academic year consists of 02 or 03 main semesters, with a total of at least 30 weeks of instruction.

The programme duration is four years, requiring the completion of 130 CPs.

- Foundation units – compulsory courses required by the Ministry of Education and Training (MOET) and National Economics University (NEU), together with general disciplinary courses (47 CPs).
- Major base units – compulsory courses providing foundational knowledge for the major (12 CPs).
- Major compulsory units – core courses of the programme (31 CPs).
- Specialised units – elective courses covering field knowledge and specialised knowledge (30 CPs).
- Project and graduation thesis (10 CPs).

Study and exam regulations (Asterisk Criterion)

Exam regulations follow the NQF issued by MOET. For each course, students are assessed through various components: participation, mid-term assessments or assignments, and a final examination. Component scores are rated on a ten-point scale. The assessment method, assessment format, and the weighting of each component are specified in the course description and announced to students at the beginning of the term. All examination details, including the student list, exam timings, and locations, are communicated to students via the university website, their email, and the class monitor before the exam date.

The assessment components of the programme's courses follow NEU regulations. In most courses, assessment consists of 10% participation, 40% mid-term examination or group assignment, and 50% final examination. To complete a course successfully, students must: (a) achieve a minimum score of five (on a ten-point scale); (b) complete all assessment items; and (c) attend at least eighty per cent of class sessions. Academic performance assessments are based on the expected learning outcomes and evaluate students' cognitive learning levels in accordance with these outcomes for each course.

According to NEU regulations, each examination paper is marked anonymously by two lecturers appointed by the heads of the relevant faculty departments. The Quality Assurance Department ensures student anonymity by separating names from exam papers. The marking process must be completed within seven working days and takes place in departmental offices. If the score difference between the two markers exceeds one point, a third marker is appointed to review the paper. Students may request a review of their exam scores by submitting a form to the Quality Assurance Department, which then forwards it to the relevant department for re-marking. The re-marking is carried out by two lecturers different from the original markers.

Under NQF and NEU regulations, students who are absent from an exam without a valid reason receive a score of zero. Those with a valid reason may retake the exam, and the result will count as their first attempt. Course grades are calculated as a weighted average of the assessment components. Mid-term and final examination periods are announced at the beginning of the semester, with detailed exam schedules posted on students' dashboards four to six weeks before the exams. Students must attend at least 80% of lectures to be eligible for final examinations. To pass courses, students must achieve a minimum average grade of 4.5 (on a 10-point scale, equivalent to a D on the ECTS or 1.0 on the 4-point grading system). Students who receive a failing grade (F) must re-register for the course.

Students may interrupt their studies for personal reasons, such as participating in academic mobility programmes. NEU has regulations on credit transfer and recognition. Credits earned during periods of study abroad may be transferred on a case-by-case basis, provided they do not exceed twenty-five per cent of the total programme workload. To be eligible for credit transfer, students must submit a learning agreement, a transcript of records, a certificate, and the course syllabus.

Feasibility of study workload (Asterisk Criterion)

The students' learning workload is calculated during curriculum development and is reviewed each semester through the teaching plan and teaching load. National Economics University issued Decision No. 1155/QD-DHKTQD on 28 June 2021, setting the maximum study load at 25 national credits per semester, in line with MOET regulations. These regulations aim to ensure that the total student workload does not exceed 40 hours per week.

To reduce the number of students failing to complete the curriculum, NEU and the programmes provide a system of academic support, including academic advisors, relevant functional departments, and an academic-alert system. This system identifies students at risk of suspension or discontinuation of their studies and ensures they receive timely advice on improving their learning outcomes, except in cases of force majeure.

To help students complete their programmes within the standard eight semesters, or four years, they are assessed and graded each semester and receive guidance from academic advisors and other functional departments. The academic-alert system also helps students with low accumulated credit points recognise the risk of delay and adjust their study plans to complete their studies within the permitted timeframe.

Student support and advisory services are provided through the university's general system, including lecturers, academic advisors, and specialists in functional departments. In addition, personalised support is offered for programme-specific issues to meet each student's individual needs.

Point grades and equivalent letter grades are presented below:

10 - point scale	4 - point scale	Letter grade
9.0 - 10.0	4.0	A+
8.5 - 8.9	4.0	A
8.0 - 8.4	3.5	B+
7.0 - 7.9	3.0	B
6.5 - 6.9	2.5	C+
5.5 - 6.4	2.0	C
5.0 - 5.4	1.5	D+
4.5 - 4.9	1.0	D
Under 4.5	0.0	F

Equality of opportunity

The programmes accept students regardless of gender, class, religion, sexual orientation, disability, or other aspects, provided they meet the programme qualifications. All students have equal benefits and responsibilities at NEU. NEU students are registered for their membership

of the NEU Student Union. The Union helps to ensure that there is no discrimination based on gender, race, age, religion, etc.

Additionally, NEU continuously seeks donors for scholarships to support talented students, students from poor families, students facing difficult conditions, and students with disabilities. The scholarship fund at NEU is substantial, and decisions on equality are reviewed annually.

NEU facilitates examinations for students with special needs; e.g., students with a mobility impairment can replace practical Physical exams with written exams or oral tests, or waive these physical courses upon case-by-case approval. Students are allowed to use their specific equipment to help them with their disabilities.

Appraisal:

The programmes' structure supports the smooth implementation of the curriculum and helps students to reach the defined learning outcomes. All three programmes consist of courses and assign credits per course on the basis of the necessary student workload. Practical components are designed and integrated in such a way that credits can be acquired. The course descriptions provide detailed descriptions of intended learning outcomes and the information defined in the ECTS Users' Guide. For the **Software Engineering** study programme, the panel suggests revising the classification in the course descriptions in line with the relevant taxonomy.

There are legally binding study and exam regulations that contain all necessary rules and procedures and, where applicable, take into account national requirements. The study programmes are designed so that students can study for a set period at other HEIs or undertake internships without extending their overall study time. The recognition of degrees and periods of study at other HEIs is regulated analogously to the Lisbon Recognition Convention; the recognition of periods of practical work, insofar as intended, is also clearly defined. The final grade is supplied with an ECTS grading table. For the **Artificial Intelligence** study programme, the panel **recommends** considering separating the internship report from the thesis. The diploma supplements currently list programme admission requirements in section 4.2 of the document ("Programme requirements / Qualification profile of the graduate"). However, the admission requirements should be moved from section 4.2 to section 3.3, and the actual graduate profiles should added in section 4.2. In addition, the panel **recommends** differentiating between the B.Eng and B.Sc. degrees and creating separate documents adapted to the specific credit volumes and qualification levels of each degree. Thus, the panel recommends the following **condition**:

- **The University reviews and updates the Diploma Supplements.**

The feasibility of the study programmes' workload is ensured by a suitable curriculum design, a plausible workload calculation, an adequate number and frequency of examinations, appropriate support services, and academic and general student counselling. The academic advisors are in close contact and can react immediately to students' needs.

NEU addresses discrimination on an individual basis. It ensures gender equality and non-discrimination. Students with special needs will be provided with affirmative action regarding

time and formal standards/requirements throughout the programme and examinations, if communicated in a timely manner. Overall, students in special circumstances received tailored assistance.

The panel **acknowledges** that Vietnam has made significant progress in promoting gender equality, supported by national policies such as the Law on Gender Equality and comparatively high levels of female participation in education and the labour market within the regional context. Building on these achievements, the panel **recommends** introducing scholarships for female students, actively recruiting female lecturers, and considering offering introductory coding courses for female applicants and students. Such measures could further strengthen gender balance and inclusivity in STEM-related study programmes, particularly in fields such as Information Technology, Data Science, and Artificial Intelligence, where women remain comparatively underrepresented.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
3.2	Structure					
3.2.1*	Modular structure of the study programme (Asterisk Criterion)			X		
3.2.2*	Study and exam regulations (Asterisk Criterion)			**Condition**		
3.2.3*	Feasibility of study workload (Asterisk Criterion)			X		
3.2.4	Equality of opportunity			X		

3.3 Didactical concept

Logic and plausibility of the didactical concept (Asterisk Criterion)

The didactical concept of each study programme is grounded in the specific Programme Learning Outcomes (PLOs) set out in the curriculum. Their objectives and intended learning outcomes are developed in response to stakeholder needs, including the NEU's mission and vision and feedback from students and employers. Every course is structured to support these outcomes, ensuring that students develop the competencies and knowledge expected by the respective industry. The course syllabi outline the learning objectives that shape both teaching approaches and assessment methods.

Students are encouraged to work both independently and collaboratively to develop a strong understanding of the course content. Lecturers employ a range of teaching methods, including lectures, class discussions, and student presentations. During tutorials, students are typically encouraged to take initiative and actively participate in the learning process.

Course materials (Asterisk Criterion)

The course materials are specified in the course outline for each subject within the curriculum. These materials are listed in the course syllabus and include textbooks, e-books, case studies, exercises, business games, and other recommended readings.

The materials for each module are prepared and provided by the lecturer or lecturer team responsible for developing and delivering the module. Lecturers supply a range of resources, including textbooks, lecture notes, scripts, recommended literature, practical examples, and case studies. Each year, lecturers may propose that the University purchase updated textbooks for their modules. They are also encouraged to develop case studies that reflect local business and management issues, making the module more practice-oriented.

Course documents for each module, in accordance with University regulations, are uploaded to the compulsory platform www.lms.neu.edu.vn and to the optional MS Teams application within Office 365. Compulsory reading materials are available through the University library, along with printed copies provided by lecturers. NEU uses a learning management system (LMS) and educational technologies to support its blended learning model, ensuring that students can easily access course materials and communicate with lecturers and peers. Additionally, lecturers from the Faculty of Information Technology actively contribute to the development of new textbooks through writing, translating, and revising academic materials.

Guest lecturers

The Faculty of Information Technology also engages a strong network of guest lecturers, including lecturers and researchers from leading universities across Vietnam, as well as IT experts and software project managers from major organisations such as the Ministry of Finance and the Ministry of Information and Communications. In addition, professionals from the Faculty's partner technology companies in Vietnam, such as VNPT IT, FSoft, and Viettel Solutions, regularly contribute to teaching and academic activities.

For the Software Engineering programme, guest lecturers are primarily selected for their substantial professional experience in software development and industry projects. Their contributions focus on sharing practical industry knowledge, applied software engineering practices, and development workflows, as well as participating in student career orientation activities. Guest lecturers have included academics from leading Vietnamese universities as well as professionals from major technology companies and training organisations. Their sessions have covered topics such as real-world software engineering practices, enterprise software development, global IT project experience, and career development in the software industry.

For the Data Science in Finance and E-commerce and Artificial Intelligence programmes, guest lecturers are invited according to clearly defined academic and professional criteria. These include teaching experience at reputable universities and demonstrated expertise in relevant subject areas, evidenced by research achievements or senior industry roles. Priority is also given to experts who can provide practical perspectives that enhance the academic curriculum. Over the last three years, invited speakers included professors and researchers from international universities as well as senior industry leaders in artificial intelligence and technology. Their lectures have addressed topics such as algorithm design and optimisation for large-scale data problems, artificial intelligence safety and modelling, computer vision, cybersecurity, supply chain analytics, e-commerce systems, and the application of AI technologies in industry and research.

Lecturing tutors

Lecturing tutors play an important role in supporting students' learning. Each 3-credit course typically includes 30 hours of lectures and 15 hours of tutorials. Tutorials are usually conducted by experienced lecturers who have previously taught the same course in other semesters. Students are expected to learn the core theoretical concepts during lectures and prepare the assigned problem sets before attending tutorials. During tutorial sessions, lecturers provide guidance, address difficulties, and clarify any misunderstandings. These sessions also offer a more interactive and supportive environment where students can strengthen their problem-solving skills and receive detailed feedback on their questions.

Appraisal:

The didactical concepts of the study programmes are described, plausible, and oriented towards the programme objectives. They apply different teaching and learning methods, such as case studies or practical projects. Students are encouraged to take an active role in creating the learning process.

The accompanying course materials are oriented towards the intended learning outcomes and correspond to the required qualification level. The materials are digitally accessible to students, it was also demonstrated during the site visit; however, they require updating. During the interview sessions, it was discussed that updated course materials are already being used in teaching, but these updates are not properly reflected in the official course descriptions.

Therefore, for all three study programmes, the panel recommends accreditation subject to the fulfilment of the following **condition**:

The University reviews and updates the materials and reading lists for the courses of the study programmes in the course descriptions.

Guest lecturers contribute to the students' qualification process across all three programmes by sharing their specialised professional and academic experience. The panel **recommends** increasing the number of guest lectures and invited speakers, including professionals from business and practice and international experts, for example through online participation.

Lecturing tutors support the students in the learning process and help them develop competencies and skills.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
3.3	Didactical concept					
3.3.1*	Logic and plausibility of the didactical concept (Asterisk Criterion)			X		
3.3.2*	Course materials (Asterisk Criterion)				**Condition**	
3.3.3	Guest lecturers			X		
3.3.4	Lecturing tutors			X		

3.4 International outlook

International contents and intercultural aspects (Asterisk Criterion)

The programmes are taught primarily in English, except for a few courses, such as politics, physical education, and defence education. Admission requires a minimum IELTS score of 6.0, as English proficiency is considered essential for graduates working in international environments such as multinational companies or international organisations.

All course materials are provided in English, and textbooks and reference sources are selected from internationally recognised authors and publishers. In addition, lecturers involved in the programme are often graduates of international universities, many of whom hold PhD degrees. They also regularly participate in international conferences and professional training activities, enabling them to incorporate up-to-date knowledge and international perspectives into their teaching.

Data Science in Finance and E-commerce
The programme is designed to prepare graduates for careers in both domestic and multinational organisations. The curriculum incorporates international perspectives and is regularly updated to reflect global developments in macroeconomics, microeconomics, corporate finance, and financial analysis. Specialised courses, including Data Analysis with Python, Data Visualisation, Big Data Technology, Deep Neural Networks, Natural Language Processing, and Computer Vision, are structured in line with international professional certification frameworks. These include the IBM Data Science Professional Certificate, Google Data Analytics and Google Advanced Data Analytics Professional Certificates, and the IBM Data Warehouse Engineer Professional Certificate.

Artificial Intelligence
The curriculum incorporates international perspectives and is regularly updated to reflect global developments in areas such as economics and Python-based data analysis. Specialised courses, including Recommendation Systems, Natural Language Processing, Computer Vision, and Software Engineering, are developed in line with international AI professional certification frameworks. These include the IBM AI Developer, AI Engineering, and AI Product Manager Professional Certificates, the Google Advanced Data Analytics Professional Certificate, and the Google IT Automation with Python Professional Certificate.

Internationality of the student body

The programmes do not have international students enrolled. The programmes plan to attract international students through two main approaches. First, it intends to recruit students from other Asian countries based on SAT or ACT admission scores. Second, the programmes aim to enable international students to participate in parts of the programmes through student exchange arrangements.

Internationality of faculty

Some lecturers completed their graduate or doctoral studies at universities abroad, including institutions in France, Hungary, the Netherlands, Taiwan, Canada, the United Kingdom, Germany, and Australia. Faculty members regularly publish in international journals and

participate in international conferences, demonstrating their international academic experience. In addition, the Faculty and the College organise monthly seminars that involve researchers from various universities. Through these activities, the Faculties and the University aim to promote international exchange with leading universities in the region and worldwide in order to enhance the quality of teaching and research. The Faculty is currently working with four partner universities—Macquarie University, the University of Adelaide, Swinburne University (Australia), and the University of Portsmouth (UK)—to develop curriculum mapping and articulation pathways for student mobility.

Data Science in Finance and E-commerce, and Artificial Intelligence
Each academic year, faculty members participate in international academic mobility activities. For example, in August 2024, the Vice Dean of the Faculty undertook a one-month academic visit to Heinrich Heine University Düsseldorf (Germany). In 2025, a lecturer participated in a short academic visit to the Czech Republic for research collaboration.

Software Engineering
In 2024, two lecturers from the Faculty participated in international academic mobility as visiting lecturers at Macquarie University and the University of Adelaide (Australia) for academic exchange and professional development. In addition, one lecturer is studying abroad for at least one month per semester at National Central University (Taiwan) from 2023 to 2025 as part of a PhD programme.

Foreign language contents

Students are required to take additional academic English courses during their studies to cope with the programme's English-language content. With the exception of a few courses without English equivalents, such as Marxist-Leninist Philosophy, Political Economics of Marxism and Leninism, Communist Party History, Ho Chi Minh Ideology, Scientific Socialism, Fundamentals of Laws, all other courses are conducted in English. Teaching materials, textbooks, examinations, and instructions are also provided in English. The aim is to enable students not only to communicate effectively but also to read and understand contemporary research literature in English. Given the highly international nature of the IT and software engineering fields, English plays a key role in the programme.

During their studies, students receive language support through English foundation and academic English courses, as well as through English-medium instruction across core subjects. Learning materials, lectures, and assessments are delivered in English to help students develop discipline-specific language skills. In addition, the HEI provides academic support services, including English tutoring, writing support, and consultation hours with instructors. Students are also encouraged to use online learning platforms and digital resources to further improve their English proficiency, while feedback on language use is incorporated into coursework to support continuous development.

Appraisal:

International content is integrated into the curricula. Students are thus prepared for the challenges in an international working environment. Through practical examples, students are enabled to act in an intercultural environment. The panel **recommends** encouraging students

to undertake internships in international companies, developing the recruitment of international students, and expanding lecturer exchange programmes to strengthen internationalisation. Furthermore, the panel **suggests** introducing a KPI plan at the faculty level with clearly defined objectives, implementation measures, and a timeline for monitoring and analysing progress and outcomes.

Given that there are no international students specifically enrolled in the three programmes under evaluation, the panel **recommends** considering and implementing measures to attract international students to the programmes.

The international composition of the faculty, including international teachers and teachers with international academic and professional experience, promotes the acquisition of international competencies and skills. The measures taken are goal-oriented.

The proportion of foreign language courses and required foreign language materials corresponds with the qualification objectives of the study programmes.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
3.4	Internationality					
3.4.1*	International contents and intercultural aspects (Asterisk Criterion)			X		
3.4.2	Internationality of the student body			X		
3.4.3	Internationality of faculty			X		
3.4.4	Foreign language contents			X		

3.5 Multidisciplinary competences and skills (Asterisk Criterion)

Skills such as communication, problem-solving, teamwork, leadership, and presentation are developed through case studies, seminars, and classroom activities. In addition, students further develop these competences through participation in seminars, extracurricular activities, and social initiatives organised by the University and the Faculty. Student organisations, including the Youth Union at the National Economics University, provide various opportunities for students to strengthen organisational, leadership, teamwork, and communication skills through workshops, competitions, social events, and festivals. Examples include charity activities supporting disadvantaged communities, the Green Summer campaign, Tet Festival celebrations, and university sports competitions such as the NEU Football League.

Appraisal:

The students acquire communication and public speaking skills, as well as cooperation and conflict-handling skills, in accordance with the course descriptions. This is supported by suitable didactic and methodological measures. The acquisition of further multidisciplinary competences, such as leadership skills and broad contextual knowledge, is ensured. The panel sees room for improvement and **strongly recommends** making multidisciplinary competencies and skills more explicit in the curriculum (e.g., project management and leadership).

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
3.5*	Multidisciplinary competences and skills (Asterisk Criterion)			X		

3.6 Skills for employment / Employability (Asterisk Criterion)

Once a year, the faculty organises visits to companies within the industry to provide students with practical insights into professional working environments. These activities are supervised by academic advisors, faculty staff, and company representatives. For final-year students, each student is assigned a lecturer who supervises the internship and final report. Supervisors may assist students in identifying internship opportunities and guide them in selecting report topics and developing their final reports. In addition, the faculty organises workshops to support students with career orientation, studying abroad opportunities, scholarship applications, CV preparation, and interview training. The faculty also hosts a student organisation, the Information Technology Club, which organises academic and recreational activities. Members of the club have achieved numerous awards and medals in national and international computing olympiads over the years.

As part of the Data Science in Finance and E-commerce programme requirements, students must complete an industry internship and prepare a graduation thesis, applying their disciplinary knowledge to address practical problems within organisations.

For the Software Engineering study programme, internship and practical training activities are formally regulated through the course syllabus. The Practical Training course is a credited module (4 national credits) managed by the Faculty of Information Technology and implemented in cooperation with partner companies. The guidelines specify the objectives, duration, supervision arrangements, assessment methods, and reporting requirements. During the internship, students gain experience in real business environments, complete assigned tasks or projects, and are evaluated based on their performance during the internship (50%) and a final report submitted to the lecturers (50%), using clearly defined assessment rubrics.

Appraisal:

The promotion of employability – for instance through the integration of theory and practice and through the promotion of multidisciplinary competences and skills – runs as a common thread of all three study programmes.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
3.6*	Skills for employment / Employability (Asterisk Criterion)			X		

4. Academic environment and framework conditions

4.1 Faculty

Structure and quantity of faculty in relation to curricular requirements (Asterisk Criterion)

All study progarmmes

A list the of teaching staff is indicated in the table below:

	Data Science in Finance and E-Commerce (Bachelor)	Artificial Intelligence (Bachelor)	Software Engineering (Bachelor)
Full-time teaching staff	17	17	19
Part-time teaching staff incl. visiting/adjunct lecturers	03	03	17
Total number of teaching staff	20	20	36
Among them:			
Teaching staff with professional experience	09	09	
Teaching staff with international experience	07	07	12
Number of professors	00	00	0
Number of associate professors	02	02	1
Number of assistant professors	00	00	0
Number of senior lecturers	07	07	12
Number of lecturers	17	17	24
PhD holders	09	09	18
Master degree holders	08	08	18
Guest lecturers	03	03	

Faculty of Data Science and Artificial Intelligence

The Faculty of Data Science and Artificial Intelligence (DSAI) was established in 2024, building on the foundation of the former Faculty of Mathematical Economics and strengthened by the recruitment of new lecturers. The Faculty currently comprises 18 academic staff members and 1 administrative staff member. Most lecturers hold doctoral degrees, including two Associate Professors, and many obtained their qualifications in Information Technology and Computer Science from reputable international universities.

The Faculty is led by a Dean and a Vice Dean, both Associate Professors, who oversee academic management and quality assurance for the programmes.

The teaching of foundational subjects such as Mathematics, Statistics, Economics, and Business is supported by lecturers from related faculties and colleges within the institution, including the Faculty of Mathematical Economics, the Faculty of Statistics, the College of Economics, and the College of Business. Meanwhile, DSAI faculty members primarily teach specialised courses in Information Technology, Computer Science, Data Science, and Artificial Intelligence. To enhance practical relevance, some application-oriented courses are delivered, in part or in full, by guest lecturers from partner technology companies.

Faculty of Information Technology

The Faculty of Information Technology (FIT) was established in 2024, building on the foundation of the former Department of Information Technology under the School of Information Technology and Digital Economics. FIT currently offers four undergraduate programmes: Computer Science (established in 2004), Information Technology (2018), Software Engineering (2024), and Information Security (2024).

The Faculty is managed by a Dean and Vice Dean, who are responsible for maintaining the academic quality of the programmes, including overseeing student advising, coordinating class schedules, and supervising teaching and research activities.

Teaching responsibilities are shared among faculty members and visiting lecturers. Within the Software Engineering programme, 27 courses are delivered by FIT lecturers, while 14 courses are taught by lecturers from other faculties. On average, each lecturer teaches approximately four to five classes per semester. To ensure teaching continuity and quality, at least two lecturers are qualified to teach each course, facilitating peer support, knowledge sharing, and consistency in course delivery.

Academic qualification of faculty (Asterisk Criterion)

The University's lecturer recruitment process follows regulations governing the recruitment of public employees and workers, including competitive exams and evaluations. The competitive exam comprises two rounds: a general knowledge test and a trial lecture/interview. The evaluation also consists of two rounds: screening and a trial lecture/interview. NEU adheres to high standards for both full-time and part-time lecturers. To become a lecturer at the University, applicants must have at least a master’s degree, graduate with honours, possess an international English certificate equivalent to IELTS 6.5 or higher, have a qualification certificate for meeting the professional title standards for level III lecturers or equivalent as prescribed, and demonstrate pedagogical skills and research capabilities.

Standards for attaining the titles of Professor and Associate Professor are clearly defined by Decision No. 37/2018/QD-TTg dated August 31, 2018, of the Prime Minister, and the University's Regulations on the Appointment and Dismissal of Professors and Associate Professors issued under Decision No. 52/QD-NEU dated February 3, 2020, of the University President.

To become a Professor or Associate Professor at the University, lecturers must undergo a review process as stipulated by the State and the University, which includes document submission, document review, candidate evaluation, presentation of the overview report, candidate assessment, a confidence vote, and publication of the results. Additional professional training is required for higher academic ranks (senior lecturer, associate professor, and full professor), and all such ranks must obtain a Certificate of Professional Title Training for University Lecturers.

NEU provides opportunities for lecturers to improve their professional qualifications with diverse annual training and retraining plans. Training courses include PhD training, teaching skills sharing, online courses on Coursera, short-term training abroad, foreign language proficiency improvement, the use of online teaching tools, standards for publishing international research articles, and scientific research methods.

Pedagogical/didactical qualification of faculty (Asterisk Criterion)

To assess the abilities and qualifications of lecturers during the recruitment process, NEU has established a Recruitment Council composed of a Chairman (either the Principal or a Vice-Principal designated by the Principal); a Vice Chairman (the Head of the Personnel

Department); the Council's Secretary (an officer from the Personnel Department), and other members who possess relevant professional expertise related to the specific vacancy.

To ensure the pedagogical qualifications of its faculty, NEU requires all newly recruited full-time and part-time lecturers to hold a pedagogy certificate. For lecturers recruited in previous years who did not yet possess such a certificate, NEU organised training courses after their appointment, enabling them to study, sit examinations, and obtain the required certificate. These courses and examinations were funded by the University and delivered by reputable external organisations, including Hanoi National University of Pedagogy and the Academy of Education Management.

After being recruited to the position of lecturer, each appointee must complete a 12-month probationary period. At the end of this period, the probationer must deliver a trial lecture and present a self-review and self-evaluation of their probation process. Those who meet the probation requirements will be appointed to the professional title of Lecturer by the Principal.

All guest lecturers must meet NEU's standards for concurrent or visiting lecturers in terms of academic qualifications, scientific research background, and pedagogical competence. The process for submitting applications for the Rector's decision on appointing concurrent or guest lecturers includes voluntary applications, academic CVs, copies of degrees and professional training certificates, evidence of pedagogical competence, evaluations from the Subject Council on teaching ability, and opinions from both the Faculty and the Subject Council.

NEU provides numerous opportunities each year for lecturers to enhance their professional qualifications and advance their careers. These opportunities include a wide range of training and refresher courses, such as doctoral programmes with open registration, short-term workshops on teaching skills for early-career lecturers, online courses via platforms such as Coursera, overseas training programmes, language improvement courses for specialised lecturers, workshops on online teaching tools, training on standards for publishing scientific research in international journals, and courses on scientific research methodologies.

At NEU, pedagogical training and certification were provided through institutions such as Hanoi National University of Pedagogy and the Academy of Education Management.

Practical business experience of faculty

Faculty members involved in the programmes possess relevant practical experience in addition to their academic qualifications. Both internal and external lecturers have several years of professional experience in industry, consultancy, or applied research related to Data Science in Finance and E-commerce, Artificial Intelligence, and related fields. Some lecturers have worked as data analysts, software engineers, or AI practitioners and have been involved in real-world projects in collaboration with national and international universities and industry partners. In addition, several lecturers have participated as principal investigators in national and international research projects. Every year, lecturers are encouraged to participate in national and international conferences, where they can update their knowledge in their respective fields and exchange ideas with experts from both industry and academia.

Internal cooperation (Asterisk Criterion)

Internal cooperation is considered one of the strengths of the Faculties, where lecturers are encouraged to collaborate in both teaching and research. This collaborative environment supports mutual motivation and fosters continuous professional development.

Regarding teaching activities, at least two lecturers are responsible for each course. This approach helps ensure that course content is regularly updated, promotes the exchange of knowledge among lecturers, and enables the incorporation of student feedback. It also creates a constructive environment within subject groups, departments, and the Faculty as a whole. In addition, groups of lecturers collaborate to develop and update lecture materials, thereby supporting the integration of new developments in the field. Meetings at both the subject-group and Faculty levels are held at the beginning and end of each semester to plan course delivery and address student feedback.

Every two years, the Faculty Academic Committee convenes to review and further develop the curriculum and update the study programmes. Additional meetings may be organised when necessary to address urgent issues. Furthermore, semi-annual Faculty-wide staff meetings are held with the participation of the management board and all lecturers to discuss administrative and academic matters, review ongoing projects, evaluate staff performance, and plan activities such as the annual Faculty conference.

At the beginning of each semester, lecturers meet to discuss teaching schedules, address technical and academic matters, agree on teaching approaches, and review assessment materials for each module. At the end of the semester, review meetings are organised to reflect on teaching and learning activities. During these meetings, lecturers share experiences, analyse student feedback, and propose improvements for the following semester. In addition, the Faculty regularly organises workshop series on academic topics and recent developments in the field, where lecturers present research findings or discuss technical issues in depth. These meetings support reflection on past teaching practices and preparation for upcoming semesters, thereby ensuring the smooth implementation of teaching activities.

With regard to research activities, the Faculty organises research groups whose members jointly propose research projects for University funding. After evaluation, the University provides funding, typically for two years. Research projects are expected to result in one to three publications in international journals. This research model encourages collaboration between senior and junior researchers, strengthens mutual support, and motivates lecturers to pursue research alongside their teaching responsibilities.

In addition, monthly Faculty seminars are organised in which researchers and experts from relevant fields are invited to deliver presentations and engage in discussions. These seminars support lecturers in updating their knowledge and strengthening their research capacity.

When developing programme curricula and course syllabi, the Faculties organise meetings to review course content and ensure coherence across subjects. This process helps avoid overlapping content and ensures alignment with the intended learning outcomes of the study programmes.

Student support by the faculty (Asterisk Criterion)

Academic advisers help students understand Ministry and NEU training regulations, develop individual study plans, choose appropriate courses, use training management software, improve their learning and research methods, and address academic difficulties. They also monitor academic performance through regular class meetings each semester, and school assistants support students during internships by helping with procedures and providing follow-up guidance. The programme coordinator works closely with academic advisers to monitor students' academic progress and to support the implementation and organisation of the programme. Additional support is also provided by lecturers teaching individual modules, who are available for questions and guidance, and by staff who supervise internships and student research. Administrative staff and the Political and Student Affairs Office are available during office hours, while important information is communicated through multiple channels, including email, the website, and student representatives. For each course, students interact directly with lecturers during weekly lectures or seminars. In addition, courses are supported through the learning management system (LMS), which enables students to communicate and exchange information with instructors at any time.

Appraisal:

The structure and number of faculty members correspond to the programmes' requirements and ensure that students achieve the intended qualification objectives. The faculty's composition, comprising full-time and part-time lecturers, ensures that both academic standards and the requirements of professional practice are fully met. The panel **encourages** the HEI to promote greater participation of female lecturers.

The academic qualification of the faculty corresponds to the requirements and objectives of the study programmes. The HEI verifies the qualifications of faculty members through an established procedure. Specific measures for the further qualification of the faculty members are implemented. The faculty's outstanding academic qualifications are underscored by scientific publications.

The pedagogical and didactical qualification of the faculty corresponds to the requirements and objectives of the study programmes. The HEI verifies the qualifications of the faculty members by means of an established procedure. The HEI ensures that assessors are familiar with existing testing and examination methods and receive support in developing their own skills in this field. Specific measures for the further qualification of the faculty members are implemented. The faculty's outstanding qualification is underlined by excellent evaluation results or by awards granted on account of the quality of teaching.

The practical business experience of the faculty members in the **Artificial Intelligence and Data Science** study programmes corresponds to the programmes' objective of integrating theory and practice. However, the panel noted a lack of practical business experience among faculty members in the **Software Engineering** study programme. Therefore, the panel **recommends** inviting adjunct lecturers with relevant industry experience to contribute to the Software Engineering study programme to strengthen its applied, industry-oriented focus.

The faculty members collaborate to align the courses with the overall qualification objectives. Meetings of all those teaching in the programmes take place regularly.

Student support is an integral part of the services provided by the faculty. It is offered on a regular basis and serves to help students study successfully.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
4.1	Faculty					
4.1.1*	Structure and quantity of faculty in relation to curricular requirements (Asterisk Criterion)			X		
4.1.2*	Academic qualification of faculty (Asterisk Criterion)		X			
4.1.3*	Pedagogical / didactical qualification of faculty (Asterisk Criterion)		X			
4.1.4	Practical business experience of faculty			DS, AI	SE	
4.1.5*	Internal cooperation (Asterisk Criterion)			X		
4.1.6*	Student support by the faculty (Asterisk Criterion)			X		
4.1.7(*)	Student support in distance learning (only relevant and an Asterisk Criterion for blended-learning/distance learning programmes)					X

4.2 Programme management

Programme Director (Asterisk Criterion)

For all three study programmes, the Heads of the Faculties also serve as Programme Directors. In this role, the Programme Director manages various aspects of the programmes, including academic, pedagogical, and didactical quality, as well as social and ethical considerations. The Programme Director also develops strategies for the professional development of lecturers and staff to ensure the programmes operate effectively and smoothly.

The Programme Director is responsible for strategic planning and for coordinating with lecturers and relevant faculties to design and annually revise the curriculum to ensure high programme quality, alignment of course learning outcomes, and responsiveness to labour market demands. Additional responsibilities include participating in admissions counselling, cooperating with departments to provide programme-related information to the public, receiving regular reports from department heads and programme coordinators, proposing appropriate solutions, meeting regularly with lecturers and staff to review and update course syllabi, and developing programme content. The Programme Director also establishes and strengthens relationships with professional organisations and enterprises to foster cooperation in research and training; supervises and evaluates the performance of lecturers and staff; approves reports required by university management; and coordinates with departments in areas such as recruitment, training, research, and career guidance.

To ensure the effective operation of the programmes, the Programme Director is supported by administrative staff and several functional departments within the University. For each study programme, the Programme Director appoints a Head of Programme who is responsible for planning, coordinating, controlling, and evaluating the implementation of activities related to education, research, and community service. The Head of Programme is also responsible for

developing concepts and plans for programme development, ensuring the organisation of class schedules and examinations, coordinating the implementation of lectures, overseeing educational and research activities, guiding and assessing students' activities, and monitoring the teaching and learning process in accordance with the curriculum and its evaluation.

Process organisation and administrative support for students and faculty

All study programmes

Students and lecturers are supported at three levels: the University level, the faculty level, and the programme level.

At the university level, the Academic Affairs Office and the Political and Student Affairs Office, NEU's functional departments, provide administrative support to students.

The Academic Affairs Office is responsible for:

- Organising the reception and placement of students matriculating into classes
- Handing over class lists to faculties
- Receiving, managing, and verifying student records

The Political and Student Affairs Office is responsible for:

- Managing the student scholarship fund and processing student loan applications
- Evaluating students' training results
- Managing residential and temporary residence information for outbound students
- Organising dialogues with students to address questions and complaints
- Providing skills education, including life skills, career skills, and aesthetic education
- Organising career guidance, job placement, and extra-curricular activities.

Students are first supported by NEU's functional departments. During their studies and after graduation, the One-Gate system assists students with administrative matters (e.g., academic transcripts, student cards, registration). The Library and Information Centre provide services related to materials, databases, and other facilities for both lecturers and students. The Political and Student Affairs Office also guides and supports students and faculty in assessing political ideology, rewards, and discipline. Mental health concerns are supported by the Clinic (e.g., periodic health examinations). The Youth Union organises activities and movements that help students develop personally and academically. Functional departments also offer short courses, such as analytics software training, research skills, and international publication skills for lecturers. NEU maintains a "Sharing Box" to collect comments and ideas from students and holds an annual "Student Dialogue" to gather student feedback and improve support services.

Each class also has an academic adviser who assists students and reports study-related issues to the programme coordinator. The academic adviser is responsible for advising students on programme content, structure, and requirements; monitoring and evaluating academic progress; participating in field trips; maintaining student evaluation records; and forwarding student feedback to the programme coordinator.

Most issues can be resolved through both offline support during office hours and online support services. Students may contact academic and administrative staff at any time for continuous academic and professional support.

Support for Students on the Programme Level includes:

- Orientation and Onboarding: The programmes begin with an orientation session to familiarise students with programme structure, curriculum, and available resources.
- Course Planning and Enrolment: Students receive guidance in planning their courses to ensure a well-rounded education in quality and innovation management. Advisers help students select courses aligned with their interests and career goals.
- Research Opportunities: Students are encouraged to participate in research projects. They have access to research resources and faculty guidance to explore innovative ideas and contribute to the field.
- Internships and Industry Collaborations: The programmes facilitate internships and partnerships with industry.
- Innovation Support Services: Students have access to innovation labs, makerspaces, and entrepreneurship centres, where they can use tools, technologies, and mentorship to develop innovative ideas and entrepreneurial projects.

Faculty members receive support through

- Faculty Development: The programmes support faculty in enhancing their knowledge and skills in innovative teaching methods and research in quality and innovation management. Professional development opportunities aim to help them stay updated with current trends and best practices.
- Collaborative Research: Faculty are encouraged to engage in interdisciplinary and collaborative research. They have access to research grants and support for disseminating research findings.
- Administrative Support: Faculty receive administrative assistance with course materials, scheduling, and grading. Staff also help organise events, seminars, and conferences related to quality and innovation management.
- Recognition and Rewards: The programmes recognise and reward faculty members who demonstrate outstanding innovation in teaching, research, and industry collaboration.

Appraisal:

The programme management supports the coordination of activities for everyone involved in the programmes and ensures that the programme runs smoothly. Currently, the Dean and the Programme Director roles are held by the same person. According to job descriptions, the Dean is responsible for the overall management and administration of all programme-related activities, while the Programme Director is specifically responsible for academic matters, including curriculum implementation and academic quality of the study programme. Therefore, separating these roles is important to ensure a clear distribution of responsibilities and effective management of the study programmes. A dedicated Programme Director can focus specifically on programme development, coordination, and quality assurance, which supports more efficient oversight and continuous improvement of the programmes. Thus, the panel **recommends** separating the roles of Dean and Programme Director and appointing a dedicated Programme Director. Furthermore, the panel **recommends** taking initiatives to promote the systematic development of the study programmes in a manner which includes all relevant groups.

The panel applauds for providing comprehensive services for students and faculty members. They are supported by the administration in organising the study programme. Sufficient administrative staff is available. Decision-making processes, authority, and responsibilities are clearly defined. The HEI offers the administrative staff opportunities for continuous professional development. Teachers and students are included in decision-making processes in which their areas of work are involved. The administrative staff acts as a service provider for students and faculty. During the site visit, it became apparent that the availability of mental health support is not widely known by students. The panel therefore **encourages** the University to proactively communicate and promote its mental health and counselling services to the student body.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
4.2	Programme management					
4.2.1*	Programme Director (Asterisk Criterion)			X		
4.2.2	Process organisation and administrative support for students and faculty		X			

4.3 Cooperation and partnerships

Cooperation with HEIs and other academic institutions or networks

NEU maintains an extensive international cooperation network with more than 100 universities and research centres in over 30 countries, including the United States, the United Kingdom, Austria, the Netherlands, Belgium, France, Canada, New Zealand, Australia, China, Taiwan, Korea, Japan, Singapore, and Thailand. These partnerships support a wide range of international activities, including cooperation in scientific research, exchange programmes for lecturers and students, and the development of joint study programmes.

To further promote cultural exchange, enhance students' career prospects, and contribute to the development of Vietnam's human resources, NEU has established various student and lecturer exchange programmes. Student exchanges are organised in different formats, including short-term and long-term mobility as well as credit and non-credit exchanges, in cooperation with partner institutions such as Dongseo University and Kangwon University (Korea), Saitama University, Senshu University and Meiji Gakuin University (Japan), Guangxi Normal University (China), Asia University (Taiwan), LUISS University (Italy), the University of Szczecin (Poland), Metropolitan University Prague (Czech Republic), universities in New Zealand, and Claude Bernard Lyon 1 University (France).

Cooperation with business enterprises and other organisations

To strengthen the involvement of external stakeholders in the training process, the faculties continuously expand their cooperation with domestic enterprises and international organisations (see evidence documents of cooperation). Furthermore, the faculties cooperate with numerous companies in specialised fields such as information technology, technology, banking, insurance, and e-commerce to provide internship opportunities for students. During the internship period, students gain experience in real working environments prior to graduation, which also enhances their employment prospects.

The Faculty of Information Technology has established cooperation agreements with numerous enterprises in the industry, including the Vietnam Posts and Telecommunications Group (VNPT), FPT Software, the Military Industry and Telecoms Group (Viettel), VTI Solutions, MISA, FAST, and BRAVO.

The Faculty of Data Science and Artificial Intelligence is a newly established unit. Nevertheless, it has already developed several cooperation agreements with domestic training and research institutions, such as the Centre for Environmental Intelligence (CEI) at VinUni. The Faculty has also collaborated with VNPT AI to organise short-term training courses on Data Science and Artificial Intelligence for working professionals.

Appraisal:

The scope and nature of cooperation with other academic institutions and networks relevant to the programmes are plausibly presented. The agreements forming the basis of the cooperation are documented. The cooperation is actively pursued and has a clear impact on the conception and implementation of the study programmes. All such activities contribute to the development of the students' qualifications and skills.

The scope and nature of cooperation with business enterprises and other institutions relevant to the programme are plausibly presented. The cooperation is actively pursued and has a clear impact on the conception and implementation of the study programme. All such activities contribute to the development of the students' qualifications and skills, especially during internships.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
4.3	Cooperation and partnerships					
4.3.1(*)	Cooperation with HEIs and other academic institutions or networks (Asterisk Criterion for cooperation programmes)			X		
4.3.2(*)	Cooperation with business enterprises and other organisations (Asterisk Criterion for educational and vocational programmes, franchise programmes)			X		

4.4 Facilities and equipment

Quantity, quality, media and IT equipment of teaching and group rooms

NEU's campus is located in the inner city of Hanoi, with a total land area of 123,522 m² in use. The total floor area for teaching and scientific research activities is 112,303 m².q There are five buildings providing learning spaces for students in NEU: building A2, lecture halls B, C, D1 and D2. Those buildings are fully equipped with high-speed, free Wi-Fi coverage throughout the campus, air conditioners, and fans. The university has 538 classrooms, offices,

laboratories, and multifunctional conference rooms equipped with modern facilities. There are 256 rooms available for approximately 30,000 students.

NEU has an elevator system that connects all classrooms in the A2 building to support people with disabilities (including wheelchair access). The office rooms and classrooms are arranged with students' needs in mind. Additionally, NEU has conference rooms with capacities of 100 to 300 people, as well as two halls with capacities of 500 to 1,000 people.

Table 1 Facilities at NEU

Type of facilities	Quantity
Large halls and classrooms over 200 people	17
Classrooms from 100 to 200 people	3
Classrooms from 50 to 100 people	159
Classrooms under 50 people	77
University Pham Van Dong Library	1
Computer lab	14
Clinic	1
Youth Union Centre	1
Textbook Space	1
NEU Career Centre	1
Thesis Defence Room	5
Teaching Staff Break Room	24
Rest rooms	210
Faculties/Departments and staff' working space	225
Ceremony halls	2
Conference rooms	9
Student canteen	2
Staff canteen	1
Football court	1
Tennis court	1
Ping Pong room	1

All classrooms are fully equipped to support learning activities, including desks, chairs, amplifiers, microphones, computers, projectors, chalkboards, and whiteboards. Modern classroom equipment is maintained and updated annually to ensure and enhance training efficiency. The classrooms are equipped with one or two projector screens so that students with disabilities, regardless of where they are seated, can clearly view the presentation.

The university has purchased Microsoft Office 365 accounts for all faculty members and office staff, as well as 40,000 student accounts. In addition, there are software applications for university management, library management, scientific research, and teaching. The university maintains 22 websites and software systems that support communication activities, administrative operations, and its overall functioning.

Faculty of Data Science and Artificial Intelligence

The Faculty of Data Science and Artificial Intelligence operates several specialised research laboratories that support academic research, applied innovation, and industry collaboration in these fields.

Business AI Laboratory (BAI Lab) focuses on research and applications of Artificial Intelligence in business contexts. The laboratory develops AI and Data Science solutions to address real-world problems across sales and marketing, finance, healthcare, and smart manufacturing.

Research Centre for Applied Data Science and Artificial Intelligence (CADA Lab) concentrates on the development and transfer of applied AI and Operations Research solutions for production, commerce, and services. Its research includes next-generation ERP systems that integrate AI and optimisation for enterprise management, intelligent customer relationship management systems, and digital learning resources that use AI-based simulation and optimisation techniques.

Data Technology and Communications Laboratory (DATCOM Lab) promotes innovation and sustainable development through research in Data Science and Artificial Intelligence. The laboratory addresses practical challenges faced by enterprises in finance, business, and technology. Its research areas include big data analytics, decision support systems, wireless network security, the Internet of Things, anomaly detection, computer vision, natural language processing, and ontology. DATCOM Lab also actively publishes research in international journals and conferences and collaborates with domestic and international partners.

Data Analytics and Optimisation Laboratory (DataOpt Lab) focuses on advanced research in mathematics and computer science, particularly in data analysis and optimisation methods for decision-making. Key research areas include big data algorithms, computational complexity, approximation algorithms, and combinatorial optimisation.

The Smart Logistics and Supply Chain Management Laboratory (SLSCM Lab) conducts research on advanced technologies in logistics and supply chain management. The laboratory develops AI- and optimisation-based solutions to improve transportation efficiency, reduce operational costs, and enhance sustainability. Its research also covers smart supply chain models, big data analytics for forecasting and decision-making, and the application of AI in logistics and transportation systems.

Faculty of Information Technology (FIT)

Regarding research activities, academic staff of the Faculty of Information Technology (FIT) currently lead two of the ten laboratories within the College of Technology.

The Educational Technology Innovation Laboratory (EdTech Lab) focuses on the research, development, and application of advanced educational technologies. The laboratory aims to enhance teaching and learning through innovative technological solutions and modern pedagogical approaches. Its research areas include Artificial Intelligence in Education, learning analytics, learning system design, online and distance learning, mobile learning, immersive technologies (VR/AR/MR/XR and eye-tracking), innovative learning models, and technology integration in education.

The Quantum Algorithms and Advanced Analytics Laboratory (QAAA Lab) conducts research on quantum computing and its applications to economic and business problems. The laboratory focuses on developing novel quantum algorithms, exploring quantum technologies and materials for next-generation computational frameworks, and integrating Artificial Intelligence, data mining, and decision support systems with quantum computing to address large-scale optimisation and business analytics challenges.

Access to literature

The University's library has been newly invested in, with seminar rooms, functional rooms, and self-study rooms. It has a service capacity to accommodate 1,000 readers at a time. The library includes 12,667 book titles with 57,608 copies, 48 journal titles with 21,283 copies, 6,441 graduate theses, 17,985 master's theses, 1,577 doctoral dissertations, 850 scientific research projects, and 37,750 electronic books. Electronic Resources (Domestic and international databases subscribed by the University): https://neulib.neu.edu.vn/article/hdsd-thu-vien.

Students of all three study programmes have access to relevant electronic databases through the University's internal network. These include:

- ProQuest Ebook Central (https://ebookcentral.proquest.com/lib/neu-ebooks/home.action) for electronic textbooks and monographs;
- Cambridge Higher Education resources (https://www.cambridge.org/highereducation/) for academic textbooks;
- Sage Journals (https://journals.sagepub.com) for multidisciplinary scholarly journals;
- Emerald Management (https://www.emerald.com/insight/).

The NEU Library is open from Monday to Saturday and occupies five storeys with a total area of 10,000 m², including 6,500 m² dedicated to reading spaces, 20 group study rooms, and 1,000 seats equipped with modern facilities. It provides information resources, covering both traditional collections (printed materials) and electronic databases purchased from international publishers.

The library includes dedicated areas such as a reading room for newspapers and magazines, a thesis and dissertation archive, and an electronic data room. These spaces are equipped with modern technology to support storage, access, and the development of academic services. Library management software supports book borrowing and returns, as well as document searches through the networked computer system, with increasing integration of mobile technology at NEU.

The library website[2] enables readers to search for information on topics of interest. The facility is fully equipped with modern furniture and equipment, including seating, tables, computers, search tools, and printing devices. The University regularly collects feedback from users through annual surveys.

Appraisal:

The panel visited the campus and the relevant facilities at NEU. They conclude that the quantity, quality, media and IT facilities of the teaching rooms meet the standards required for the programmes, even taking into account the resource needs of other study programmes. The rooms are properly equipped for disabled students and give them barrier-free access. Access to the internet via wireless Internet is provided free of charge. A sufficient number of group rooms is available. The teaching rooms and laboratories are equipped with state-of-the-art technology. During the site visit, the panel also visited several labs. Well-equipped laboratories enable students to apply theoretical knowledge in practice and support the development of relevant technical skills.

[2] see: https://opaclib.neu.edu.vn/, last access: January 14, 2026.

The library's opening hours take students' needs into sufficient account. Access to the literature and journals, as well as to digital media (e.g. electronic media, databases) is ensured. The literature expressly required for the study programmes is available in the library and is also kept up to date. The library is accessible during most of the day. Access to relevant digital media is available from the students' homes. Qualified library staff are there to advise students.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
4.4	Facilities and equipment					
4.4.1*	Quantity, quality, media and IT equipment of teaching and group rooms (Asterisk Criterion)		X			
4.4.2*	Access to literature (Asterisk Criterion)		X			

4.4 Additional services

Career counselling and placement service

NEU has implemented support measures to increase the percentage of graduates who secure jobs relevant to their fields of study. In addition to the content of the study programmes, these measures include:

- Academic Counsellors: Every student has an assigned academic counsellor, who is a lecturer in the respective study programme, and who counsels students in questions regarding career after studies.
- Active Employer Engagement: Recruiters are invited to provide consultation on recruitment processes. Faculties, institutes, and centres responsible for student management also invite employers to share job-hunting experiences and workplace skills.
- Internship Opportunities: Many students are introduced to career opportunities during their internships through faculty and school connections, often leading to job offers immediately after graduation.
- NEU Career Centre: Established in 2019, the Centre serves as the permanent unit responsible for career orientation and job support for students. Students can participate in annual career guidance activities covering career orientation, study methods, and professional internships.
- Job Fairs on the University level as well as the study programme level: Held periodically to meet real recruitment needs from dozens of businesses. Students receive guidance on application writing, CV preparation, job interviewing, and workplace communication skills. The University also encourages participation in professional examinations.
- Business Relationships: NEU maintains and expands partnerships with businesses to update the curriculum and invite guest lecturers. The University also facilitates students' access to the labour market throughout their studies, not only at graduation.
- Job Placement Success Survey: NEU conducts annual surveys to collect data on graduate employment status and to evaluate the effectiveness of job support measures.

- Start-up competition: For final year students, NEU organises a Start-up competition to support entrepreneurship activities.

Alumni Activities

In 2015, the President of NEU signed Decision No. 1056/QĐ-ĐHKTQD to promulgate the Regulations on the organisation and operation of NEU's alumni network. Since then, an alumni network has been formally organised and expanded nationwide. The network has an executive board, with the honorary president being a former President of Vietnam. The executive board meets annually to review the past year's activities and outline the programme for the upcoming year. Additionally, this annual meeting serves as an event for connection and appreciation.

The University has a dedicated department to manage the network's regular activities, assigning administrative staff to run the network office. This department is also responsible for maintaining the network's website.

The activities of the NEU alumni network include:

- Networking Events: Regular meet-ups, reunions, and networking events to connect alumni with each other and with current students.
- Career Development: Workshops, seminars, and mentoring programmes to support career development and professional growth for alumni and students.
- Social and Cultural Activities: Social gatherings, cultural events, and community service projects that foster a sense of community and contribute to society. Annual golf tournaments attract thousands of alumni participants.
- Guest Lectures and Panels: Inviting distinguished alumni to give talks, participate in panel discussions, and share their experiences and expertise.
- Fundraising and Scholarships: Organising fundraising events and campaigns to support scholarships, research initiatives, and other university projects.
- Online Platforms: Maintaining online platforms and social media groups to facilitate communication and information-sharing among alumni.
- These activities help strengthen the bond between alumni and the institution, promote lifelong learning, and support the University's mission and goals.

Appraisal:

Career counselling and placement services are offered to the students and graduates to promote their employability. NEU provides sufficient resources. Since the programmes have not yet enrolled students, there are no alumni activities; however, an alumni organisation has been set up with the aim of developing an alumni network.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
4.5	Additional services					
4.5.1	Career counselling and placement service			X		
4.5.2	Alumni Activities			X		

4.5 Financing of the study programme (Asterisk Criterion)

Founded in 1956, NEU is a non-profit, public university under the supervision of MOET, financed by student fees and government support. The University's infrastructure investments are funded by the state budget, while regular expenditure is covered by students' tuition fees. These include payments for lectures and course fees, training costs (such as student activities, advertising, and marketing), management expenses, and training costs for lectures at partner universities remitted to the University. The study programmes are financed through tuition fees, which are published so that students are aware of the financial requirements before enrolment. NEU's Finance and Accounting Department checks tuition fee payments each semester. The University also offers a range of supportive policies to ease students' financial constraints. To recognise and reward academic excellence, NEU and its partner businesses provide scholarships to deserving students.

Appraisal:

The income related to the programmes ensures that each cohort of students starting within the accreditation period can complete the study programme.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
4.6*	Financing of the study programme (Asterisk Criterion)			X		

5. Quality assurance and documentation

Quality assurance and quality development with respect to contents, processes and outcomes (Asterisk Criterion)

NEU adheres to quality standards set by MOET, as well as international models such as the Asian University Network Quality Assurance (AUN-QA) and American and European standards. The quality management structure operates at both the university and faculty/department levels.

At the University level, the Quality Assurance Council is responsible for consulting and monitoring strategy and planning for quality assurance. The Department of Quality Assurance and Accreditation advises on setting objectives, policies, processes, regulations, and specific plans for educational quality assurance across the University. The Council meets regularly every two years. The University reviews and updates study programmes in line with MOET and NEU regulations, incorporating feedback from lecturers and students to enhance teaching and support activities. Stakeholder input from seminars and surveys is also collected to support quality development.

At the faculty level, the Quality Assurance Units are responsible for developing their own quality assurance plans and implementing the University's processes and regulations in collaboration with the programme coordinator. Programme development follows the PDCA cycle, aiming to ensure that tasks are planned, checked, evaluated, and improved regularly. The Department of Quality Assurance and Accreditation, as well as the Department of Training Management, also conduct quality control processes on the study programme level.

To maintain standards, the University focuses on training frameworks, teaching methods, course content, facilities, support services, and management systems. Feedback is actively collected from students, lecturers, and employers. Evaluation results are analysed and shared with lecturers and programme managers. Data from surveys and statistical analyses are used to guide adjustments to improve quality.

The Programme Management Board uses evaluations to review and improve programmes annually. Improvements may include adding new courses, replacing existing ones, or redesigning courses to better help students achieve programme goals and course objectives. Revised programmes are approved by the Faculty Council and the NEU President before implementation. Each course instructor receives evaluation results to support quality improvement. Based on detailed feedback, instructors may adjust teaching approaches, learning task design, adherence to schedules, and communication skills.

Instruments of quality assurance

Evaluation by students

Students provide feedback on teaching activities for each course during their learning process via the University's general system. The IT department uploads evaluation sheets to the system, and students give direct feedback for each course each semester. The survey covers questions about whether the objectives and learning outcomes of the course align with the teaching content and methods used by the lecturers, the adequacy of facilities, the provision

of study materials, and overall student satisfaction with the course. The results are analysed and sent to lecturers and the programme management board, with individual course survey results sent directly to lecturers.

Before their graduation, students complete a survey containing questions on various aspects of the programme, including programme objectives, learning outcomes, the curriculum, the workload, and the acquired knowledge and skills. The results of both surveys are used to review and update the programmes.

For the quality of higher education services, annual surveys are conducted involving all undergraduate students, graduate students, and doctoral candidates. The survey content encompasses all activities related to the provision of educational services. The results of these surveys not only serve the University's quality assurance activities but are also reported to the Ministry of Education and Training's Quality Management Department.

Furthermore, NEU periodically organises dialogue sessions with students at both the faculty and university levels to gather opinions and address the majority of student concerns. Assessment content is announced to students during these dialogue seminars. In addition, the academic adviser serves as a channel for timely and effective feedback between the University and the faculty. All changes implemented based on the surveys are officially communicated to stakeholders via NEU emails, faculty meetings, and briefings during class meetings at the beginning of the following semester. Beyond surveys, students are also involved in evaluation and consultation processes through meetings between class representatives and academic advisors, as well as through informal consultations with instructors, programme coordinators, and academic directors. In addition, student representatives participate in internal review discussions and provide input on teaching methods.

In the Software Engineering study programme, workload is evaluated through classroom interactions, where lecturers discuss workload with students and monitor assignment completion. In addition, an end-of-semester survey is conducted to collect students' feedback, which is reviewed and used to make adjustments as needed.

Evaluation by faculty

The Programme Management Board sends questionnaires using Microsoft Forms to gather lecturers' opinions regarding aspects such as study programme output standards, the structure and content of the programme, teaching methods, and class organisation activities. Furthermore, for each course, lecturers' views on students' in-class activities, students' sense of discipline, and support activities from the programme will be collected. In addition to gathering opinions from lecturers on the curriculum and students' in-class activities through surveys, the Programme Management Board will also be prepared to receive direct comments from its members.

The results of lecturers' assessments of the study programme, student learning activities, and the programme's support for each specific course will be analysed by the Programme Management Board, specifically by the study assistants. Once the evaluation results are available, the Programme Management Board will meet to conduct a joint assessment and provide solutions to address existing issues.

External evaluation by alumni, employers and third parties

The Faculties of Data Science, Artificial Intelligence, and Information Technology collect programme evaluation information from employers and other external stakeholders through focus group discussions organised occasionally. In addition, informal discussions with stakeholders occur when they are invited to the faculty to give talks or to participate in career orientation seminars.

Programme documentation

Programme description (Asterisk Criterion)
The faculties are responsible for developing programme descriptions. All course syllabi are prepared by the academic departments and approved by the Faculty Council. The programmes' descriptions, course syllabi and curriculum are then approved by the President of NEU and published on the University's website (https://en.neu.edu.vn/).

Information on activities during the academic year
Other activities during the academic year include general events for all University students, such as citizenship activities at the start of the course, introductory class meetings, national defence education sessions, medical examinations, and student feedback surveys on teaching. All of these are published in advance on the University's website, or faculties websites (https://fit.neu.edu.vn/) and through academic adviser channels.

Appraisal:

A quality assurance and development procedure, which systematically and continuously monitors and develops the quality of the programmes with respect to its contents, processes, and outcomes, has been set up. It takes into account the evaluation results and the analysis on success rate, and graduate employment as well as the profile of the student population.

The panel was provided with responses and evaluation sheets during the site visit and noted that the response rate is relatively high. Building on this positive engagement, the panel **recommends** implementing a system of continuous feedback throughout the semester to further support the quality of teaching and learning. In addition, the panel **suggests** evaluating students' ability to follow and understand lecture content in English. The panel considers that continuous feedback throughout the semester would also allow the HEI to address issues in a timely manner.

Faculty members and students participate in the respective committees to plan and assess the quality assurance and development procedures. Responsibilities are clearly defined.

Evaluation by the students is carried out on a regular basis and in accordance with a prescribed procedure; the outcomes are communicated to the students and provide input for the quality development process.

Quality control by the faculty is carried out on a regular basis and in accordance with a prescribed procedure; the outcomes are communicated and provide input for the quality development process. The panel **welcomes** the mentorship provided for new lecturers. The panel **recommends** implementing a peer review process for all lectures in order to further

strengthen teaching quality and support continuous improvement. A peer review process would allow lecturers to receive constructive feedback from colleagues, which can help improve teaching methods and course delivery.

As the study programmes do not yet have graduates, the panel was not able to properly evaluate this criterion. However, based on the fact that the HEI conducts external evaluations in accordance with a prescribed procedure for the other study programmes, the panel assumes that this will also be implemented once graduates are available.

The study programmes' content, curricula, and examination schemes have been suitably documented and published, but only in the Vietnamese language. Thus, the panel **strongly recommends** ensuring that all information is translated into and made available in English.

The HEI regularly publishes current news and information – both quantitative and qualitative – about the study programme. The panel **strongly recommends** ensuring that all information is translated into and made available in English. Providing information in English would further support the international orientation of the study programmes and ensure transparency and accessibility of information for international stakeholders.

		Exceptional	Exceeds quality requirements	Meets quality requirements	Does not meet quality requirements	n.r.
5.1*	Quality assurance and quality development with respect to contents, processes and outcomes (Asterisk Criterion)			X		
5.2	Instruments of quality assurance					
5.2.1	Evaluation by students			X		
5.2.2	Evaluation by faculty			X		
5.2.3	External evaluation by alumni, employers and third parties			X		
5.3	Programme documentation					
5.3.1*	Programme description (Asterisk Criterion)			X		
5.3.2	Information on activities during the academic year			X		

Annex 1

Curriculum Overview / Data Science in Finance and E-commerce

Modul No.	Title of Module / Course Unit + Compulsory / Elective	Credit Points per Semester								Workload		Method of Teaching	Form and Duration of Examinations	weight of exam related to final grade
		1.	2	3.	4.	5	6.	7	8	Hours in Class	Hours Self-Study	i.e. lecture course, seminar		
	1st Semester	19												
M1	**Marxist-Leninist Philosophy (Compulsory)**	**3**								**45**	**60**			**3 / 130**
M 1.1	Introduction to the fundamentals of Marxism - Leninism									5	5	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 1.2	Dialectical materialism									10	15	L/S		
M 1.3	Materialist dialectics									15	20	L/S		
M 1.4	Historical materialism									15	20	L/S		
M2	**Political Economics of Marxism and Leninism (Compulsory)**	**2**								**45**	**60**			**2 / 130**
M 2.1	Commodities, markets and the role of market participants									10	15	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (60 Min)	
M 2.2	Competition and monopoly in the market economy									10	15	L/S		
M 2.3	Socialist-oriented market economy and economic interest relations									10	15	L/S		
M 2.4	Industrialization, Modernization and international economic integration of Vietnam									15	15	L/S		
M3	**Algebra (Compulsory)**	**3**								**45**	**81**			**3 / 130**
M 3.1	Systems of Linear Equations									9	15	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam	
M 3.2	Matrix: definition, operations, inverse matrix, determinant									9	15	L/T/S		
M 3.3	Vector Space									9	15	L/T/S		

M 3.4	Rank of Matrix and Diagonalization									6	12	L/T/S	Exam Paper (90 Min)	
M 3.5	Linear Transformations									6	12	L/T/S		
M 3.6	Chane of Basis									3	6	L/T/S		
M 3.7	Applications (Case study in Machine learning)									3	6	L/T/S		
M4	**Calculus (Compulsory)**	**3**								**45**	**81**			**3 / 130**
M 4.1	Set Theory and Functions (Pre-Calculus)									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 4.2	Limits, Continuity and Derivatives of Single Variable Functions									3	6	L/T/S		
M 4.3	Concavity, Approximation, Taylor Polynomials, Newton Methods, Extrema									9	15	L/T/S		
M 4.4	Integrals of Single Variable Functions									6	12	L/T/S		
M 4.5	Limits, Continuity and Derivatives of Multivariable Functions									9	15	L/T/S		
M 4.6	Approximation, Taylor Polynomials, Extrema, Constrained Optimization									9	15	L/T/S		
M 4.7	Integrals of Multivariable Functions									6	12	L/T/S		
M5	**Integrated skills English for business and economics 1 (Compulsory)**	**6**								**90**				**3 / 130**
M 5.1	Course Introduction									6		L/S	Midterm Exam Listening-Reading test (60 Min) and Writing Task Final Exam Group Presentation (15 min for each group)	
M 5.2	Brands and Travel									12		L/S		
M 5.3	Change and Organisation									12		L/S		
M 5.4	Advertising and Money									12		L/S		
M 5.5	Cultures and Human									12		L/S		
M 5.6	International markets and Ethics									12		L/S		
M 5.7	Leadership and Competition									12		L/S		
M 5.8	Summary and Group assignment									12		L/S		
M6	**Introduction to Data Science (Compulsory)**	**2**								**30**	**45**			**3 / 130**
M 6.1	Course Introduction									3	0	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (60 Min)	
M 6.2	Roles and Applications of Data science									3	5	L/S		
M 6.3	The Data Science Road Map									3	5	L/S		
M 6.4	Tools and Techniques for Data science									6	10	L/S		
M 6.5	Data Ecosystem									3	5	L/S		

M 6.6	Data Engineers, Data Analytics and Business Intelligence Analytics									6	10	L/S		
M 6.7	Big data									3	5	L/S		
M 6.8	Digital Transformation									3	5	L/S		
	2nd Semester		**17**											
M7	**Microeconomics 1 (Compulsory)**		**3**							**45**	**90**			**3 / 130**
M 7.1	Overview of Economics; Thinking Like an Economist; Interdependence and the Gains from Trade									9	20	L/T/S	Midterm Exam Group project Final Exam Exam Paper (90 Min)	
M 7.2	The Market Forces of Supply and Demand									3	6	L/T/S		
M 7.3	Elasticity and its Application									3	6	L/T/S		
M 7.4	The Theory of Consumer Choice									3	6	L/T/S		
M 7.5	The Costs of Production									3	6	L/T/S		
M 7.6	Market Structure: Firms in Competitive Markets and Monopoly									3	6	L/T/S		
M 7.7	Market Structure: Monopolistic Competition and Oligopoly									3	6	L/T/S		
M 7.8	Review and Presentation									3	6	L/T/S		
M 7.9	Efficiency of Markets and Market Failure									3	6	L/T/S		
M 7.10	Supply, Demand and Government Policies									3	6	L/T/S		
M 7.11	Presentation and Review									9	16	L/T/S		
M8	**Integrated skills English for business and economics 2 (Compulsory)**		**3**							**45**	**60**			**3 / 130**
M 8.1	Communication									6	10	L/T/S	Midterm Exam Listening-Reading test (60 Min) and Writing Task Final Exam Group Presentation (15 min for each group)	
M 8.2	International marketing									6	10	L/T/S		
M 8.3	Building relationship									6	10	L/T/S		
M 8.4	Success									6	10	L/T/S		
M 8.5	Review									3	0	L/T/S		
M 8.6	Job satisfaction									6	10	L/T/S		
M 8.7	Risk									6	10	L/T/S		
M 8.8	Review									3	0	L/T/S		
M 8.9	Summary and Group assignment									3	0	L/T/S		

M9	**Discrete Mathematics (Compulsory)**		**3**							**45**	**81**			**3 / 130**
M 9.1	Logic and Set									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 9.2	Proofs									3	6	L/T/S		
M 9.3	Functions, Strings, and Relations									3	6	L/T/S		
M 9.4	Algorithms									3	6	L/T/S		
M 9.5	Introduction to number theory									3	6	L/T/S		
M 9.6	Counting problems and Dirichlet's principle									6	12	L/T/S		
M 9.7	Review									3	0	L/T/S		
M 9.8	Graph Theory									9	15	L/T/S		
M 9.9	Tree									6	12	L/T/S		
M 9.10	Modeling Computation									3	6	L/T/S		
M 9.11	Review									3	6	L/T/S		
M10	**Probability Theory (Compulsory)**		**3**							**45**	**60**			**3 / 130**
M 10.1	A general introduction to the probability									12	15	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 10.2	Univariate random variables									18	20	L/T/S		
M 10.3	Multivariate random variables									12	20	L/T/S		
M 10.4	Law of large number									3	5	L/T/S		
M11	**Fundamental Programming in Python (Compulsory)**		**3**							**45**	**90**			**3 / 130**
M 11.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Computer-based Exam (90 Min)	
M 11.2	Software Development, Data types									3	6	L/T/S		
M 11.3	Decision Making									3	6	L/T/S		
M 11.4	Loops									3	6	L/T/S		
M 11.5	Functions									3	6	L/T/S		
M 11.6	List and Tuples									3	6	L/T/S		

M 11.7	Review									3	6	L/T/S		
M 11.8	Files and Exceptions									6	12	L/T/S		
M 11.9	Set and Dictionary									3	6	L/T/S		
M 11.10	Object and class									6	12	L/T/S		
M 11.11	Introduction to Inheritance and Poly									6	12	L/T/S		
M 11.12	Review									3	6	L/T/S		
M12	**Linux Operating Systems (Compulsory)**		**2**							**30**	**60**			**2 / 130**
M 12.1	Introduction to Operating Systems and Ubuntu									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 12.2	Command Line Proficiency and System Management									6	12	L/T/S		
M 12.3	User and Security Fundamentals									3	6	L/T/S		
M 12.4	Networking and Remote Management									3	6	L/T/S		
M 12.5	Review									3	6	L/T/S		
M 12.6	Advanced Server Configuration									6	12	L/T/S		
M 12.7	Configure Times Series DB and tools for data analysis									6	12	L/T/S		
	3rd Semester			**15**										
M13	**Macroeconomics 1 (Compulsory)**			**3**						**45**	**90**			**3 / 130**
M 13.1	An Overview of Money and Finance									6	12	L/S	Midterm Exam Exam Paper (60 Min) + Group Presentation Final Exam Exam Paper (90 Min)	
M 13.2	Financial System									3	6	L/S		
M 13.3	State Budget									3	6	L/S		
M 13.4	Corporate finance									3	6	L/S		
M 13.5	Credit and Interest Rate									6	12	L/S		
M 13.6	Financial market									6	12	L/S		

M 13.7	Commercial bank									3	6	L/S		
M 13.8	Central bank and Monetary									6	12	L/S		
M 13.9	Inflation									3	6	L/S		
M 13.10	International Finance									3	6	L/S		
M 13.11	Review									3	6	L/S		
M14	**Mathematical Statistics (Compulsory)**			**3**						**45**	**90**			**3 / 130**
M 14.1	Basic concepts									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 14.2	Descriptive Statistics									6	12	L/T/S		
M 14.3	Population and Parameter									3	6	L/T/S		
M 14.4	Random Sample									6	12	L/T/S		
M 14.5	Point Estimate									3	6	L/T/S		
M 14.6	Confidence Interval									3	6	L/T/S		
M 14.7	Hypothesis Testing									3	6	L/T/S		
M 14.8	Inference on Two Samples									6	12	L/T/S		
M 14.9	Analysis of Variance									3	6	L/T/S		
M 14.10	Non-parametric test									3	6	L/T/S		
M 14.11	Introduce to Bayesian Statistics									3	6	L/T/S		
M 14.12	Review									3	6	L/T/S		
M15	**Data Structures and Algorithms in Python (Compulsory)**			**3**						**45**	**90**			**3 / 130**
M 15.1	Introduction to common data structures & built-in collection and external libraries									3	6	L/T/S	Midterm Exam Computer-based Exam (60 Min) Final Exam	
M 15.2	Asymptotic complexity & Big-O notations									3	6	L/T/S		
M 15.3	Search, sorting and its complexity									6	12	L/T/S		

M 15.4	Array and Linked Structures									6	12	L/T/S	Computer-based Exam (90 Min)	
M 15.5	Stack, Queue & Dequeues									6	12	L/T/S		
M 15.6	Review									3	6	L/T/S		
M 15.7	General Trees and Binary trees									3	6	L/T/S		
M 15.8	Binary search trees									6	12	L/T/S		
M 15.9	Priority Queues									3	6	L/T/S		
M 15.10	Hash & Hash Tables									3	6	L/T/S		
M 15.11	Review									3	6	L/T/S		
M16	**Network Technology and Communication (Compulsory)**			**3**						**45**	**90**			**3 / 130**
M 16.1	Introduction to Computer Networks									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 16.2	The OSI and TCP/IP Models									3	6	L/T/S		
M 16.3	Application Layer Protocols									3	6	L/T/S		
M 16.4	Transport Layer Services									6	12	L/T/S		
M 16.5	Network Layer and Routing									6	12	L/T/S		
M 16.6	Data Link Layer and LANs									6	12	L/T/S		
M 16.7	Review									3	6	L/T/S		
M 16.8	Wireless Networks and Protocols									3	6	L/T/S		
M 16.9	Project proposals									6	12	L/T/S		
M 16.10	Mini Project									6	12	L/T/S		
M17	**Commercial Bank (Elective)***			**3**						**45**	**90**			**3 / 130**
M 17.1	Overview of the banking sector									3	6	L/S	Midterm Exam Exam Paper (60 Min)	
M 17.2	The financial statements of banks									3	6	L/S		

M 17.3	Managing and pricing deposit services									3	6	L/S	Final Exam Exam Paper (90 Min)	
M 17.4	Lending to business firms and pricing business loans									3	6	L/S		
M 17.5	Consumer loans, credit cards and real estate lending									3	6	L/S		
M 17.6	Risk Management for Changing Interest Rates									3	6	L/S		
M 17.7	Group presentation and discussion									27	54	L/S		
M18	**Accounting Principles (Elective)***			**3**						**45**	**90**			**3 / 130**
M 18.1	Accounting in action									3	6	L/S	Mid-term exam Writing individual assignment Final exam Exam paper (90 min)	
M 18.2	The recording process									3	6	L/S		
M 18.3	Adjusting the accounts									3	6	L/S		
M 18.4	Completing the Accounting Cycles									6	12	L/S		
M 18.5	Review									3	6	L/S		
M 18.6	Accounting for Merchandising Operation									6	12	L/S		
M 18.7	Inventories									3	6	L/S		
M 18.8	Accounting for Receivables									3	6	L/S		
M 18.9	Plant Assets, Natural Resources, and Intangible Assets									3	6	L/S		
M 18.10	Current Liabilities and Payroll Accounting									3	6	L/S		
M 18.11	Long-Term Liabilities									3	6	L/S		
M 18.12	Corporations: Organization and Capital Stock Transactions									3	6	L/S		
M 18.13	Corporations: Dividends, Retained Earnings, and Income Reporting									3	6	L/S		
	****Students choose either M17 or M18***													
	4th Semester				**18**									
M19	**Mathematics for Data Science and Artificial Intelligence (Compulsory)**				**3**					**45**	**90**			**3 / 130**

M 19.1	Basics Notions in Analytics Geometry									6	12	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 19.2	Matrix Decompositions and Approximations									6	12	L/T/S		
M 19.3	Vector Calculus									6	12	L/T/S		
M 19.4	Mathematical Programming									9	18	L/T/S		
M 19.5	Review									3	6	L/T/S		
M 19.6	When Models meet Data									3	6	L/T/S		
M 19.7	Regression									3	6	L/T/S		
M 19.8	Dimensionality Reduction									3	6	L/T/S		
M 19.9	Classification									3	6	L/T/S		
M 19.10	Review									3	6	L/T/S		
M20	**Fundamentals of Database (Compulsory)**				**3**					**45**	**90**			**3 / 130**
M 20.1	Database Systems									3	6	L/T/S	Midterm exam Computer-based Exam (60 min) Final Exam Group Project and Presentation (15-30 min each group)	
M 20.2	Data Models									3	6	L/T/S		
M 20.3	The Relational Database Model									3	6	L/T/S		
M 20.4	Entity Relationship Modeling									6	12	L/T/S		
M 20.5	Advanced Data Modeling									6	12	L/T/S		
M 20.6	Normalization of Database Tables									3	6	L/T/S		
M 20.7	Review									3	6	L/T/S		
M 20.8	Introduction to SQL									6	12	L/T/S		
M 20.9	Advanced SQL									6	12	L/T/S		
M 20.10	Database Design									3	6	L/T/S		
M 20.11	Review									3	6	L/T/S		

M21	**Data Analysis with Python (Compulsory)**				**3**					**45**	**90**			**3 / 130**
M 21.1	Course introduction									3	6	L/T/S	Midterm exam Computer-based Exam (60 min) Final Exam Group Project and Presentation (15-30 min each group)	
M 21.2	Statistics and Linear Algebra computing Libraries									6	12	L/T/S		
M 21.3	Data visualization & exploration									3	6	L/T/S		
M 21.4	Data Retrieving and storing									3	6	L/T/S		
M 21.5	Data Cleaning									3	6	L/T/S		
M 21.6	Review									3	6	L/T/S		
M 21.7	Data segmentation and clustering									6	12	L/T/S		
M 21.8	Data prediction & Linear Regression									6	12	L/T/S		
M 21.9	Data prediction & Non-Linear Regression									3	6	L/T/S		
M 21.10	Data and Binary Classification									3	6	L/T/S		
M 21.11	Data and multiclass classification									3	6	L/T/S		
M 21.12	Review									3	6	L/T/S		
M22	**Cloud computing (Compulsory)**				**3**					**45**	**90**			**3 / 130**
M 22.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Essay Written Exam	
M 22.2	Overview of cloud computing									6	12	L/T/S		
M 22.3	Parallel data processing in the cloud									6	12	L/T/S		
M 22.4	Cloud storage system									6	12	L/T/S		
M 22.5	Review									3	6	L/T/S		
M 22.6	Safety and security									6	12	L/T/S		
M 22.7	Using cloud computing services									6	12	L/T/S		
M 22.8	Group Presentation									6	12	L/T/S		

M 22.9	Review									3	6	L/T/S		
M23	**Information Security (Compulsory)**				**3**					**45**	**90**			**3 / 130**
M 23.1	Introduction									6	12	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 23.2	Information security standards and regulations									6	12	L/T/S		
M 23.3	Cryptography and information security									12	24	L/T/S		
M 23.4	Review									3	6	L/T/S		
M 23.5	Digital Steganography and Watermarking									3	6	L/T/S		
M 23.6	Internet of Things (IoT) Security									3	6	L/T/S		
M 23.7	Cloud computing security									3	6	L/T/S		
M 23.8	Big data and AI (Artificial Intelligence) security									9	18	L/T/S		
M24	**Monetary and Financial Theories (Elective)***				**3**					**45**	**90**			**3 / 130**
M 24.1	An Overview of Money and Finance									6	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 24.2	Financial System									3	6	L/S		
M 24.3	State Budget									3	6	L/S		
M 24.4	Corporate finance									3	6	L/S		
M 24.5	Credit and Interest Rate									6	12	L/S		
M 24.6	Financial market									6	12	L/S		
M 24.7	Commercial bank									3	6	L/S		
M 24.8	Central bank and Monetary Policy									6	12	L/S		
M 24.9	Inflation									3	6	L/S		
M 24.10	International Finance									3	6	L/S		
M 24.11	Review									3	6	L/S		

M25	**Introduction to E-Commerce (Elective)***				**3**					**45**	**90**			**3 / 130**
M 25.1	Overview of E-commerce									6	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 25.2	Hardware, software and computer network									3	6	L/S		
M 25.3	EC Website									6	12	L/S		
M 25.4	E – commerce strategy									3	6	L/S		
M 25.5	E – commerce retailing									6	12	L/S		
M 25.6	Online B2B transaction									6	12	L/S		
M 25.7	E – government									3	6	L/S		
M 25.8	Online payment and security									3	6	L/S		
M 25.9	Fulfilment in EC									3	6	L/S		
M 25.10	Digital marketing									6	12	L/S		

******Students choose either M24 or M25***

5th Semester **18**

M26	**Statistical learning (Compulsory)**					**3**				**45**	**90**			**3 / 130**
M 26.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 26.2	Linear Regression									6	12	L/T/S		
M 26.3	Classification									6	12	L/T/S		
M 26.4	Linear Model Selection and Regularization									6	12	L/T/S		
M 26.5	Review									3	6	L/T/S		
M 26.6	Tree-Based Methods									6	12	L/T/S		
M 26.7	Support Vector Machines									6	12	L/T/S		
M 26.8	Unsupervised Learning									6	12	L/T/S		

M 26.9	Review									3	6	L/T/S		
M27	**Advanced Database (Compulsory)**					**3**				**45**	**90**			**5 / 210**
M 27.1	Introduction about the course - Overview of NoSQL databases									6	12	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 27.2	Document Databases - MongoDB									6	12	L/T/S		
M 27.3	Key-Value Pair Databases - Redis									6	12	L/T/S		
M 27.4	Column Family Databases - Cassandra									6	12	L/T/S		
M 27.5	Graph Databases - Neo4J									6	12	L/T/S		
M 27.6	Polyglot Persistence									6	12	L/T/S		
M 27.7	Group presentation									6	12	L/T/S		
M 27.8	Review									3	6	L/T/S		
M28	**Tools and Techniques for Business Analystics (Elective)***					**3**				**45**	**90**			**3 / 130**
M 28.1	Introduction and Overview									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 28.2	Linear Programming Models									6	12	L/T/S		
M 28.3	Transportation, Assignment, and Network Models									6	12	L/T/S		
M 28.4	Integer, Goal, and Nonlinear Programming Models									3	6	L/T/S		
M 28.5	Project Management									3	6	L/T/S		
M 28.6	Decision Analysis									6	12	L/T/S		
M 28.7	Queuing Models									6	12	L/T/S		
M 28.8	Simulation Modeling									6	12	L/T/S		
M 28.9	Forecasting Models									6	12	L/T/S		
M29	**Blockchain Technology (Elective)***					**3**				**45**	**90**			**3 / 130**
M 29.1	Introduction to Blockchain									3	6	L/T/S	Midterm Exam	

M 29.2	Blockchain Architecture									3	6	L/T/S	Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 29.3	Consensus									3	6	L/T/S		
M 29.4	Cryptography, Hash Function, and Digital signature									3	6	L/T/S		
M 29.5	Consensus Algorithms									3	6	L/T/S		
M 29.6	Review									3	6	L/T/S		
M 29.7	Digital Money versus Cryptocurrencies									3	6	L/T/S		
M 29.8	Basics of Bitcoin									3	6	L/T/S		
M 29.9	The Bitcoin Network and Payments									3	6	L/T/S		
M 29.10	Bitcoin Mining									3	6	L/T/S		
M 29.11	Smart Contracts									3	6	L/T/S		
M 29.12	Ethereum									3	6	L/T/S		
M 29.13	Blockchain in IoT and e-Government									3	6	L/T/S		
M 29.14	Blockchain in Trading and Finance									3	6	L/T/S		
M 29.15	Review									3	6	L/T/S		
M30	**Data-driven Marketing (Elective)***					**3**				**45**	**90**			**3 / 130**
M 30.1	Introduction									3	6	L/T/S	Midterm Exam Group Project and Presentation (15-30 min each group) Final Exam Group Project and Presentation (15-30 min each group)	
M 30.2	Key Performance Indicators and Visualizations									3	6	L/T/S		
M 30.3	Using regression analysis for explanatory analysis									3	6	L/T/S		
M 30.4	From Engagement to Conversion									3	6	L/T/S		
M 30.5	Product Analytics									3	6	L/T/S		
M 30.6	Recommending the Right Products									6	12	L/T/S		
M 30.7	Review									3	6	L/T/S		

M 30.8	Exploratory Analysis for Customer Behavior									3	6	L/T/S		
M 30.9	Predicting the Likelihood of Marketing Engagement									3	6	L/T/S		
M 30.10	Customer Lifetime Value									3	6	L/T/S		
M 30.11	Data Driven Customer Segmentation									3	6	L/T/S		
M 30.12	Retaining Customers									3	6	L/T/S		
M 30.13	Group presentation									3	6	L/T/S		
	Review									3	6	L/T/S		
M31	**Computer Vision (Elective)***					**3**				**45**	**90**			**3 / 130**
M 31.1	Introduction to Computer Vision									3	6	L/T/S	Midterm Exam Group Project and Presentation (15-30 min each group) Final Exam Group Project and Presentation (15-30 min each group)	
M 31.2	Image Formation and Representation									3	6	L/T/S		
M 31.3	Image Filtering									3	6	L/T/S		
M 31.4	Edge Detection									3	6	L/T/S		
M 31.5	Segmentation									3	6	L/T/S		
M 31.6	Feature Extraction, Description and Matching									3	6	L/T/S		
M 31.7	Recognition									6	12	L/T/S		
M 31.8	Project									3	6	L/T/S		
M 31.9	Feature-based alignment									3	6	L/T/S		
M 31.10	Camera Calibration									3	6	L/T/S		
M 31.11	Stereo Vision									3	6	L/T/S		
M 31.12	Image stitching									3	6	L/T/S		
M 31.13	Image-based rendering									3	6	L/T/S		
M 31.14	Review									3	6	L/T/S		

M32	**Web design and programming (Elective)***					**3**				**45**	**90**			**3 / 130**
M 32.1	Website Overview									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 32.2	Website Design Overview									3	6	L/T/S		
M 32.3	HTML language									6	12	L/T/S		
M 32.4	Cascading Style Sheets									6	12	L/T/S		
M 32.5	Review									3	6	L/T/S		
M 32.6	Javascript									6	12	L/T/S		
M 32.7	Web Development									12	24	L/T/S		
M 32.8	Group presentation									6	12	L/T/S		
M33	**Object-Oriented Programming with Java (Elective)***					**3**				**45**	**90**			**3 / 130**
M 33.1	Creating Java Programs									3	6	L/T/S	Midterm Exam Computer Exam (60 min) Final Exam Group Project and Presentation (15-30 min each group)	
M 33.2	Using Data									3	6	L/T/S		
M 33.3	Using Methods									3	6	L/T/S		
M 33.4	Using Classes and Objects									3	6	L/T/S		
M 33.5	Making Decisions and Loops									3	6	L/T/S		
M 33.6	Characters, Strings, and the StringBuilder									3	6	L/T/S		
M 33.7	Arrays									3	6	L/T/S		
M 33.8	Review									3	6	L/T/S		
M 33.9	Inheritance and Interfaces									6	12	L/T/S		
M 33.10	Exception Handling									3	6	L/T/S		
M 33.11	Collections and Generics									3	6	L/T/S		
M 33.12	Introduction to Design Patterns									6	12	L/T/S		

M 33.13	Review									3	6	L/T/S		
M34	**Coporate finance (Elective)****					**3**				**45**	**90**			**3 / 130**
M 34.1	Introduction to Corporate Finance									3	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 34.2	Financial Statements and Cashflow									6	12	L/S		
M 34.3	Financial Statement Analysis									6	12	L/S		
M 34.4	Discounted Cash Flow Valuation									6	12	L/S		
M 34.5	Review									3	6	L/S		
M 34.6	Interest rate and bond valuation									3	6	L/S		
M 34.7	Stock valuation									3	6	L/S		
M 34.8	Group Presentation									12	24	L/S		
M 34.9	Review									3	6	L/S		
M35	**Financial Risk Management (Elective)****					**3**				**45**	**90**			**3 / 130**
M 35.1	Foundation of Risk management									6	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 35.2	Market risk									6	12	L/S		
M 35.3	Interest rate risk from Banking book									6	12	L/S		
M 35.4	Hedging tools									6	12	L/S		
M 35.5	Review									3	6	L/S		
M 35.6	Credit risk									6	12	L/S		
M 35.7	Operational risk and other risks									6	12	L/S		
M 35.8	Review									6	12	L/S		

Students choose either {M28, M31}; or {M32, M33}
****Students choose either {M29, M30}; or {M34, M35}***

6th Semester 18

M36	**Data Mining (Compulsory)**						**3**			**45**	**90**			**3 / 130**
M 36.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 36.2	Getting to Know Your Data									3	6	L/T/S		
M 36.3	Data Preprocessing									3	6	L/T/S		
M 36.4	Data Warehousing and Data Cube Technology									3	6	L/T/S		
M 36.5	Mining Frequent Patterns, Associations, and Correlations									3	6	L/T/S		
M 36.6	Advanced Pattern Mining									3	6	L/T/S		
M 36.7	Review									3	6	L/T/S		
M 36.8	Classification Models									3	6	L/T/S		
M 36.9	Advanced Classification Models									3	6	L/T/S		
M 36.10	Cluster Analysis									3	6	L/T/S		
M 36.11	Advanced Cluster Analysis									3	6	L/T/S		
M 36.12	Outlier Detection									3	6	L/T/S		
M 36.13	Data Mining and Research Frontiers									3	6	L/T/S		
M 36.14	Project Presentation									3	6	L/T/S		
M 36.15	Review									3	6	L/T/S		
M37	**Time Series Analysis and Forcasting (Compulsory)**						**3**			**45**	**90**			**3 / 130**
M 37.1	Course Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 37.2	NumPy, Pandas and Its Applications for Time Series Analysis									6	12	L/T/S		
M 37.3	Exploratory Time Series Data Analysis									6	12	L/T/S		
M 37.4	Stationary Time Series Models									6	12	L/T/S		
M 37.5	ARMA and ARIMA Modeling and Forecasting									6	12	L/T/S		

M 37.6	Review									3	6	L/T/S		
M 37.7	Nonstationary Time Series Models									6	12	L/T/S		
M 37.8	Financial Time Series and Related Models									6	12	L/T/S		
M 37.9	Project Presentation									3	6	L/T/S		
M38	**Data Visualization (Compulsory)**						**3**			**45**	**90**			**3 / 130**
M 38.1	Introduction									3	6	L/T/S	Midterm Exam Computer Exam (60 min) Final Exam Group Project and Presentation (15-30 min each group)	
M 38.2	R, Power BI , and Tableau Course Material									6	12	L/T/S		
M 38.3	Selecting a Chart Type									3	6	L/T/S		
M 38.4	Data Visualization and Design									3	6	L/T/S		
M 38.5	Data preparation									6	12	L/T/S		
M 38.6	Review									3	6	L/T/S		
M 38.7	Exploring Data Visually									6	12	L/T/S		
M 38.8	Explaining Visually to Influence with Data									3	6	L/T/S		
M 38.9	Data Dashboard									6	12	L/T/S		
M 38.10	Project Presentation									6	12	L/T/S		
M39	**Big Data Technology (Compulsory)**						**3**			**45**	**90**			**3 / 130**
M 39.1	Introduction to Big Data									3	6	L/T/S	Midterm Exam Computer Exam (60 min) Final Exam Computer Exam (90 min)	
M 39.2	Using Big Data in Businesses									3	6	L/T/S		
M 39.3	Technologies for Handling Big Data									3	6	L/T/S		
M 39.4	Understanding Hadoop Ecosystem									6	12	L/T/S		
M 39.5	Databases and Data Warehouses									3	6	L/T/S		
M 39.6	Using Hadoop to store data									3	6	L/T/S		

M 39.7	Learn to Process Data using Map Reduce									3	6	L/T/S		
M 39.8	Learn Hadoop YARN Architecture									3	6	L/T/S		
M 39.9	Introduction to Spark									3	6	L/T/S		
M 39.10	Spark core									6	12	L/T/S		
M 39.11	Spark SQL									6	12	L/T/S		
M 39.12	Review									3	6	L/T/S		
M40	**Deep neural network (Elective)***						**3**			**45**	**90**			**3 / 130**
M 40.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 40.2	Shallow neural networks									3	6	L/T/S		
M 40.3	Deep neural networks									3	6	L/T/S		
M 40.4	Training neural networks									3	6	L/T/S		
M 40.5	Convolutional neural networks									3	6	L/T/S		
M 40.6	Residual networks									3	6	L/T/S		
M 40.7	Recurrent Neural Networks									3	6	L/T/S		
M 40.8	Review									3	6	L/T/S		
M 40.9	Transformer									3	6	L/T/S		
M 40.10	Generative Adversarial Networks									3	6	L/T/S		
M 40.11	Other Advanced DNN Models									3	6	L/T/S		
M 40.12	Why does deep learning work?									3	6	L/T/S		
M 40.13	Project Presentation									6	12			
	Review									3	6	L/T/S		
M41	**Numerical Methods for Data Science (Elective)***						**3**			**45**	**90**			**3 / 130**

M 41.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Computer Exam (90 Min)	
M 41.2	Classification problems									3	6	L/T/S		
M 41.3	Unconstrained minimization problems									3	6	L/T/S		
M 41.4	Second order methods									3	6	L/T/S		
M 41.5	Least square problems									3	6	L/T/S		
M 41.6	Review									3	6	L/T/S		
M 41.7	Matrix factorization									6	12	L/T/S		
M 41.8	Dimension reduction									9	18	L/T/S		
M 41.9	Graph data analysis									9	18	L/T/S		
M 41.10	Review									3	6	L/T/S		
M42	**Distributed Systems (Elective)***						**3**			**45**	**90**			**3 / 130**
M 42.1	Introduction									9	18	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 42.2	Processes in distributed systems									6	12	L/T/S		
M 42.3	Safety and Security									6	12	L/T/S		
M 42.4	Review									3	6	L/T/S		
M 42.5	Building up the systems									6	12	L/T/S		
M 42.6	Error detection and correction									6	12	L/T/S		
M 42.7	Project Presentation									6	12	L/T/S		
M 42.8	Review									3	6	L/T/S		
M43	**Data Warehouse (Elective)***						**3**			**45**	**90**			**3 / 130**
M 43.1	Introduction									3	6	L/T/S	Midterm Exam Group Project and	
M 43.2	Introduction of Dimensional Modeling and Data Warehouse Architectures									3	6	L/T/S		

M 43.3	Data Dimensional Modeling Techniques									6	12	L/T/S	Presentation (15-30 min each group) Final Exam Group Project and Presentation (15-30 min each group)	
M 43.4	Retail Sales, Accounting and Financial Services									3	6	L/T/S		
M 43.5	Customer Relationship Management, Inventory and Transportation									3	6	L/T/S		
M 43.6	Healthcare, Electronic Commerce and Insurance									3	6	L/T/S		
M 43.7	Review									3	6	L/T/S		
M 43.8	Data Warehouse Lifecycle									3	6	L/T/S		
M 43.9	Dimensional Modeling Process and Tasks									3	6	L/T/S		
M 43.10	ETL and Techniques									6	12	L/T/S		
M 43.11	ETL System Design, Development Process and Tasks									3	6	L/T/S		
M 43.12	Data Warehouse and Big Data									3	6	L/T/S		
M 43.13	Cloud Data Warehouses									3	6	L/T/S		

Students choose either {M40, M41}; or {M42, M43}

7th Semester **10**

M44	**Scientific Socialism (Compulsory)**							**2**		**30**	**60**			**2 / 130**
M 44.1	Introduction to Scientific Socialism									3	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (60 Min)	
M 44.2	The historical mission of the Working class									3	6	L/S		
M 44.3	Socialism and the Transition to Socialism Period									6	12	L/S		
M 44.4	Socialist democracy and the Socialist state									6	12	L/S		
M 44.5	Class - social structure and class alliances in the Transition to Socialism Period									6	12	L/S		
M 44.6	Ethnic and Religious issues in the Transition to Socialism Period									6	12	L/S		
M45	**Communist Party History (Compulsory)**							**2**		**30**	**60**			**2 / 130**
M 45.1	The foundation of the Communist Party of Vietnam and the leads to seize power (1930-1945)									9	18	L/S	Midterm Exam	

M 45.2	The Communist Party of Vietnam led two resistance wars, completed national liberation and reunification (1945-1975)									9	18	L/S	Exam Paper (60 Min) Final Exam Exam Paper (60 Min)	
M 45.3	The Communist Party of Vietnam led the country in the transition to socialism and carried out DOI MOI (1975-present)									6	12	L/S		
M 45.4	Conclusion									6	12	L/S		
M46	**Internship (Compulsory)**							**3**		**18**	**30**			**3 / 130**
M 46.1	Students go for their internship									9	15	S	Report & Presentation (60 min each group)	
M 46.2	Students submit their internship reports by the end of their internship									9	15	S		
M47	**Natural language processing (Elective)***							**3**		**45**	**90**			**3 / 130**
M 47.1	Introduction to NLP									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 47.2	Regular Expressions, Text Normalization, Edit Distance									3	6	L/T/S		
M 47.3	N-gram Language Models									3	6	L/T/S		
M 47.4	Vector Semantics and Embeddings									3	6	L/T/S		
M 47.5	Sequence Labeling for Parts of Speech and Named Entities									3	6	L/T/S		
M 47.6	RNNs and LSTMs									3	6	L/T/S		
M 47.7	Review									3	6	L/T/S		
M 47.8	Transformers and Large Language Models									3	6	L/T/S		
M 47.9	Fine-Tuning and Masked Language Models									3	6	L/T/S		
M 47.10	Annotating Linguistic Structure									6	12	L/T/S		
M 47.11	NLP Application									6	12	L/T/S		
M 47.12	Project Presentation									3	6	L/T/S		
M 47.13	Review									3	6	L/T/S		
M48	**Project (Elective)***							**3**		**45**	**90**			**3 / 130**

M 48.1	Project introduction									3	6	T/S	Report & Presentation (60 min each group)	
M 48.2	Outline of Project									6	12	T/S		
M 48.3	Literature review									6	12	T/S		
M 48.4	Data Collection and Processing									6	12	T/S		
M 48.5	Data Analysis and Visualization									6	12	T/S		
M 48.6	Writing									6	12	T/S		
M 48.7	Review and Revision									6	12	T/S		
M 48.8	Finalization and Presentation									6	12	T/S		

Students choose either M47; or M48

8th Semester **15**

M49	**Recommender Systems (Elective)***								**3**	**45**	**90**			**3 / 130**
M 49.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 49.2	Neighborhood-Based Collaborative Filtering									3	6	L/T/S		
M 49.3	Model-Based Collaborative Filtering									3	6	L/T/S		
M 49.4	Content-Based Recommender Systems									3	6	L/T/S		
M 49.5	Knowledge-Based Recommender Systems									3	6	L/T/S		
M 49.6	Ensemble-Based and Hybrid Recommender Systems									3	6	L/T/S		
M 49.7	Evaluating Recommender Systems									3	6	L/T/S		
M 49.8	Context-Sensitive Recommender Systems									3	6	L/T/S		
M 49.9	Review									3	6	L/T/S		
M 49.10	Time- and Location-Sensitive Recommender Systems									3	6	L/T/S		
M 49.11	Structural Recommendations in Networks									3	6	L/T/S		

M 49.12	Social and Trust-Centric Recommender Systems									3	6	L/T/S		
M 49.13	Attack-Resistant Recommender Systems									3	6	L/T/S		
M 49.14	Project Presentation									3	6	L/T/S		
M 49.15	Review									3	6	L/T/S		
M50	**Financial Analysis (Elective)***								**3**	**45**	**90**			**3 / 130**
M 50.1	Introduction of Financial Analysis									3	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (60 Min)	
M 50.2	Financial Statement and analysis									6	12	L/S		
M 50.3	Analyzing operating activities									3	6	L/S		
M 50.4	Cash flow analysis									6	12	L/S		
M 50.5	Analyzing financing activities									3	6	L/S		
M 50.6	Return on invested capital and profitability analysis									3	6	L/S		
M 50.7	Review									3	6	L/S		
M 50.8	Financial planning and forecasting									6	12	L/S		
M 50.9	Financial statement quality									3	6	L/S		
M 50.10	Group presentation									6	12	L/S		
M 50.11	Review									3	6	L/S		
M51	**Ho Chi Minh Ideology (Compulsory)**								**2**	**30**	**60**			**2 / 130**
M 51.1	Ho Chi Minh's ideology: Concept, object, research methods and learning implications									6	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (60 Min)	
M 51.2	Background, the formation and development of Ho Chi Minh's ideology									3	6	L/S		
M 51.3	Ho Chi Minh's ideology on national independence and socialism									6	12	L/S		
M 51.4	Ho Chi Minh's ideology on the Communist Party of Vietnam and the State of the people, by the people, for the people									6	12	L/S		

M 51.5	Ho Chi Minh's ideology on great national solidarity and international solidarity									6	12	L/S		
M 51.6	Ho Chi Minh's ideology on culture, ethics, and people									3	6	L/S		
M52	**Fundamentals of Laws (Compulsory)**								**3**	**30**	**60**			**3 / 130**
M 52.1	The basic issues of state									3	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (60 Min)	
M 52.2	The basic issues of law									6	12	L/S		
M 52.3	Legal form and legal system									6	12	L/S		
M 52.4	Administrative Law in Vietnam									6	12	L/S		
M 52.5	Civil Law in Vietnam									6	12	L/S		
M 52.6	Criminal Law in Vietnam									3	6	L/S		
BA	**Bachelor's Thesis**								**7**					**10 / 130**

Students choose either M49; or M50

Total number of Credits	**19**	**17**	**15**	**18**	**18**	**18**	**10**	**15**			

L: ***Lecture***

S: ***Seminar***

T: ***Tutorial***

130

Annex 2

Curriculum Overview / Artificial Intelligence

Modul No.	Title of Module / Course Unit + Compulsory / Elecitive	Credit Points per Semester								Workload		Method of Teaching	Form and Duration of Examinations	weight of exam related to final grade
		1.	2	3.	4.	5	6.	7	8	Hours in Class	Hours Self-Study	i.e. lecture course, seminar		
	1st Semester	20												
M1	**Marxist-Leninist Philosophy (Compulsory)**	**3**								**45**	**60**			**3 / 130**
M 1.1	Introduction to the fundamentals of Marxism - Leninism									5	5	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 1.2	Dialectical materialism									10	15	L/S		
M 1.3	Materialist dialectics									15	20	L/S		
M 1.4	Historical materialism									15	20	L/S		
M2	**Political Economics of Marxism and Leninism (Compulsory)**	**2**								**45**	**60**			**2 / 130**
M 2.1	Commodities, markets and the role of market participants									10	15	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (60 Min)	
M 2.2	Competition and monopoly in the market economy									10	15	L/S		
M 2.3	Socialist-oriented market economy and economic interest relations									10	15	L/S		
M 2.4	Industrialization, Modernization and international economic integration of Vietnam									15	15	L/S		
M3	**Algebra (Compulsory)**	**3**								**45**	**81**			**3 / 130**
M 3.1	Systems of Linear Equations									9	15	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 3.2	Matrix: definition, operations, inverse matrix, determinant									9	15	L/T/S		
M 3.3	Vector Space									9	15	L/T/S		
M 3.4	Rank of Matrix and Diagonalization									6	12	L/T/S		
M 3.5	Linear Transformations									6	12	L/T/S		
M 3.6	Chane of Basis									3	6	L/T/S		
M 3.7	Applications (Case study in Machine learning)									3	6	L/T/S		
M4	**Calculus (Compulsory)**	**3**								**45**	**81**			**3 / 130**

M 4.1	Set Theory and Functions (Pre-Calculus)									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 4.2	Limits, Continuity and Derivatives of Single Variable Functions									3	6	L/T/S		
M 4.3	Concavity, Approximation, Taylor Polynomials, Newton Methods, Extrema									9	15	L/T/S		
M 4.4	Integrals of Single Variable Functions									6	12	L/T/S		
M 4.5	Limits, Continuity and Derivatives of Multivariable Functions									9	15	L/T/S		
M 4.6	Approximation, Taylor Polynomials, Extrema, Constrained Optimization									9	15	L/T/S		
M 4.7	Integrals of Multivariable Functions									6	12	L/T/S		
M5	**Integrated skills English for business and economics 1 (Compulsory)**	**6**								**90**	**180**			**6 / 130**
M 5.1	Course Introduction									6	12	L/S	Midterm Exam Listening-Reading test (60 Min) and Writing Task Final Exam Group Presentation (15 min for each group)	
M 5.2	Brands and Travel									12	24	L/S		
M 5.3	Change and Organisation									12	24	L/S		
M 5.4	Advertising and Money									12	24	L/S		
M 5.5	Cultures and Human									12	24	L/S		
M 5.6	International markets and Ethics									12	24	L/S		
M 5.7	Leadership and Competition									12	24	L/S		
M 5.8	Summary and Group assignment									12	24	L/S		
M6	**Introduction to Information Technology (Compulsory)**	**3**								**45**	**90**			**3 / 130**
M 6.1	Overview of Information Technology									6	12	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (60 Min)	
M 6.2	Data Representation and Organization of Computer Systems									3	6	L/T/S		
M 6.3	Common Software									6	12	L/T/S		
M 6.4	Review									3	6	L/T/S		
M 6.5	C Programming Language									27	54	L/T/S		
	2nd Semester		**18**											
M7	**Microeconomics 1 (Compulsory)**		**3**							**45**	**90**			**3 / 130**
M 7.1	Overview of Economics; Thinking Like an Economist; Interdependence and the Gains from Trade									9	20	L/T/S	Midterm Exam Group project Final Exam Exam Paper (90 Min)	
M 7.2	The Market Forces of Supply and Demand									3	6	L/T/S		
M 7.3	Elasticity and its Application									3	6	L/T/S		

M 7.4	The Theory of Consumer Choice									3	6	L/T/S		
M 7.5	The Costs of Production									3	6	L/T/S		
M 7.6	Market Structure: Firms in Competitive Markets and Monopoly									3	6	L/T/S		
M 7.7	Market Structure: Monopolistic Competition and Oligopoly									3	6	L/T/S		
M 7.8	Review and Presentation									3	6	L/T/S		
M 7.9	Efficiency of Markets and Market Failure									3	6	L/T/S		
M 7.10	Supply, Demand and Government Policies									3	6	L/T/S		
M 7.11	Presentation and Review									9	16	L/T/S		
M8	**Integrated skills English for business and economics 2 (Compulsory)**		**3**							**45**	**60**			**3 / 130**
M 8.1	Communication									6	10	L/T/S	Midterm Exam Listening-Reading test (60 Min) and Writing Task Final Exam Group Presentation (15 min for each group)	
M 8.2	International marketing									6	10	L/T/S		
M 8.3	Building relationship									6	10	L/T/S		
M 8.4	Success									6	10	L/T/S		
M 8.5	Review									3	0	L/T/S		
M 8.6	Job satisfaction									6	10	L/T/S		
M 8.7	Risk									6	10	L/T/S		
M 8.8	Review									3	0	L/T/S		
M 8.9	Summary and Group assignment									3	0	L/T/S		
M9	**Discrete Mathematics (Compulsory)**		**3**							**45**	**81**			**3 / 130**
M 9.1	Logic and Set									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 9.2	Proofs									3	6	L/T/S		
M 9.3	Functions, Strings, and Relations									3	6	L/T/S		
M 9.4	Algorithms									3	6	L/T/S		
M 9.5	Introduction to number theory									3	6	L/T/S		
M 9.6	Counting problems and Dirichlet's principle									6	12	L/T/S		
M 9.7	Review									3	0	L/T/S		
M 9.8	Graph Theory									9	15	L/T/S		
M 9.9	Tree									6	12	L/T/S		

M 9.10	Modeling Computation									3	6	L/T/S		
M 9.11	Review									3	6	L/T/S		
M10	**Probability and Mathematical Statistics (Compulsory)**		**3**							**45**	**90**			**3 / 130**
M 10.1	An Introduction to Business Statistics									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 10.2	Identify the ratio, interval, ordinal, and nominative scales of measurement									3	6	L/T/S		
M 10.3	Descriptive Statistics: Numerical Methods									3	6	L/T/S		
M 10.4	Probability									3	6	L/T/S		
M 10.5	Discrete Random Variables									3	6	L/T/S		
M 10.6	Continuous Random Variables									6	12	L/T/S		
M 10.7	Sampling and Sampling Distributions									6	12	L/T/S		
M 10.8	Confidence Intervals									3	6	L/T/S		
M 10.9	Hypothesis Testing									3	6	L/T/S		
M 10.10	Comparing Two Means and Two Proportions									3	6	L/T/S		
M 10.11	Statistical Inferences for Population Variances									3	6	L/T/S		
M 10.12	Experimental Design and Analysis of Variance									3	6	L/T/S		
M 10.13	Chi-squared Test									3	6	L/T/S		
M11	**Fundamental Programming in Python (Compulsory)**		**3**							**45**	**90**			**3 / 130**
M 11.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Computer-based Exam (90 Min)	
M 11.2	Software Development, Data types									3	6	L/T/S		
M 11.3	Decision Making									3	6	L/T/S		
M 11.4	Loops									3	6	L/T/S		
M 11.5	Functions									3	6	L/T/S		
M 11.6	List and Tuples									3	6	L/T/S		
M 11.7	Review									3	6	L/T/S		
M 11.8	Files and Exceptions									6	12	L/T/S		
M 11.9	Set and Dictionary									3	6	L/T/S		

M 11.10	Object and class									6	12	L/T/S		
M 11.11	Introduction to Inheritance and Poly									6	12	L/T/S		
M 11.12	Review									3	6	L/T/S		
M12	**Linux Operating Systems (Compulsory)**		**3**							**30**	**60**			**3 / 130**
M 12.1	Introduction to Operating Systems and Ubuntu									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 12.2	Command Line Proficiency and System Management									6	12	L/T/S		
M 12.3	User and Security Fundamentals									3	6	L/T/S		
M 12.4	Networking and Remote Management									3	6	L/T/S		
M 12.5	Review									3	6	L/T/S		
M 12.6	Advanced Server Configuration									6	12	L/T/S		
M 12.7	Configure Times Series DB and tools for data analysis									6	12	L/T/S		
	3rd Semester			**18**										
M13	**Macroeconomics 1 (Compulsory)**			**3**						**45**	**90**			**3 / 130**
M 13.1	An Overview of Money and Finance									6	12	L/S	Midterm Exam Exam Paper (60 Min) + Group Presentation Final Exam Exam Paper (90 Min)	
M 13.2	Financial System									3	6	L/S		
M 13.3	State Budget									3	6	L/S		
M 13.4	Corporate finance									3	6	L/S		
M 13.5	Credit and Interest Rate									6	12	L/S		
M 13.6	Financial market									6	12	L/S		
M 13.7	Commercial bank									3	6	L/S		
M 13.8	Central bank and Monetary									6	12	L/S		
M 13.9	Inflation									3	6	L/S		
M 13.10	International Finance									3	6	L/S		
M 13.11	Review									3	6	L/S		
M14	**Fundamentals of Laws (Compulsory)**			**3**						**30**	**60**			**3 / 130**
M 14.1	The basic issues of state									3	6	L/S		

M 14.2	The basic issues of law									6	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 14.3	Legal form and legal system									6	12	L/S		
M 14.4	Administrative Law in Vietnam									6	12	L/S		
M 14.5	Civil Law in Vietnam									6	12	L/S		
M 14.6	Criminal Law in Vietnam									3	6	L/S		
M15	**Data Structures and Algorithms in Python (Compulsory)**			**3**						**45**	**90**			**3 / 130**
M 15.1	Introduction to common data structures & built-in collection and external libraries									3	6	L/T/S	Midterm Exam Computer-based Exam (60 Min) Final Exam Computer-based Exam (90 Min)	
M 15.2	Asymptotic complexity & Big-O notations									3	6	L/T/S		
M 15.3	Search, sorting and its complexity									6	12	L/T/S		
M 15.4	Array and Linked Structures									6	12	L/T/S		
M 15.5	Stack, Queue & Dequeues									6	12	L/T/S		
M 15.6	Review									3	6	L/T/S		
M 15.7	General Trees and Binary trees									3	6	L/T/S		
M 15.8	Binary search trees									6	12	L/T/S		
M 15.9	Priority Queues									3	6	L/T/S		
M 15.10	Hash & Hash Tables									3	6	L/T/S		
M 15.11	Review									3	6	L/T/S		
M16	**Data Analysis with Python (Compulsory)**			**3**						**45**	**90**			**3 / 130**
M 16.1	Course introduction									3	6	L/T/S	Midterm exam Computer-based Exam (60 min) Final Exam Group Project and Presentation (15-30 min each group)	
M 16.2	Statistics and Linear Algebra computing Libraries									6	12	L/T/S		
M 16.3	Data visualization & exploration									3	6	L/T/S		
M 16.4	Data Retrieving and storing									3	6	L/T/S		
M 16.5	Data Cleaning									3	6	L/T/S		
M 16.6	Review									3	6	L/T/S		
M 16.7	Data segmentation and clustering									6	12	L/T/S		
M 16.8	Data prediction & Linear Regression									6	12	L/T/S		
M 16.9	Data prediction & Non-Linear Regression									3	6	L/T/S		
M 16.10	Data and Binary Classification									3	6	L/T/S		

M 16.11	Data and multiclass classification									3	6	L/T/S		
M 16.12	Review									3	6	L/T/S		
M17	**Introduction to Artificial Intelligence (Compulsory)**			**3**						**45**	**90**			**3 / 130**
M 17.1	Introduction									3	6	L/T/S	Midterm exam Paper Exam (60 min) Final Exam Group Project and Presentation (15-30 min each group)	
M 17.2	Search									6	12	L/T/S		
M 17.3	Reasoning with uncertainty									3	6	L/T/S		
M 17.4	Introduction to machine learning									12	24	L/T/S		
M 17.5	Review									3	6	L/T/S		
M 17.6	Machine learning									6	12	L/T/S		
M 17.7	Deep learning and applications									6	12	L/T/S		
M 17.8	Ethics & AI, Infrastructure for AI, Futures of AI									3	6	L/T/S		
M 17.9	Project Presentation									3	6	L/T/S		
M18	**Fundamentals of Database (Compulsory)**			**3**						**45**	**90**			**3 / 130**
M 18.1	Database Systems									3	6	L/T/S	Midterm exam Computer-based Exam (60 min) Final Exam Group Project and Presentation (15-30 min each group)	
M 18.2	Data Models									3	6	L/T/S		
M 18.3	The Relational Database Model									3	6	L/T/S		
M 18.4	Entity Relationship Modeling									6	12	L/T/S		
M 18.5	Advanced Data Modeling									6	12	L/T/S		
M 18.6	Normalization of Database Tables									3	6	L/T/S		
M 18.7	Review									3	6	L/T/S		
M 18.8	Introduction to SQL									6	12	L/T/S		
M 18.9	Advanced SQL									6	12	L/T/S		
M 18.10	Database Design									3	6	L/T/S		
M 18.11	Review									3	6	L/T/S		
	4th Semester				**18**									
M19	**Statistical learning (Compulsory)**				**3**					**45**	**90**			**3 / 130**
M 19.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min)	
M 19.2	Linear Regression									6	12	L/T/S		

M 19.3	Classification									6	12	L/T/S	Final Exam Group Project and Presentation (15-30 min each group)	
M 19.4	Linear Model Selection and Regularization									6	12	L/T/S		
M 19.5	Review									3	6	L/T/S		
M 19.6	Tree-Based Methods									6	12	L/T/S		
M 19.7	Support Vector Machines									6	12	L/T/S		
M 19.8	Unsupervised Learning									6	12	L/T/S		
M 19.9	Review									3	6	L/T/S		
M20	**Time Series Analysis and Forcasting (Compulsory)**				**3**					**45**	**90**			**3 / 130**
M 20.1	Course Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 20.2	NumPy, Pandas and Its Applications for Time Series Analysis									6	12	L/T/S		
M 20.3	Exploratory Time Series Data Analysis									6	12	L/T/S		
M 20.4	Stationary Time Series Models									6	12	L/T/S		
M 20.5	ARMA and ARIMA Modeling and Forecasting									6	12	L/T/S		
M 20.6	Review									3	6	L/T/S		
M 20.7	Nonstationary Time Series Models									6	12	L/T/S		
M 20.8	Financial Time Series and Related Models									6	12	L/T/S		
M 20.9	Project Presentation									3	6	L/T/S		
M21	**Advanced Database (Compulsory)**				**3**					**45**	**90**			**3 / 210**
M 21.1	Introduction about the course - Overview of NoSQL databases									6	12	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 21.2	Document Databases - MongoDB									6	12	L/T/S		
M 21.3	Key-Value Pair Databases - Redis									6	12	L/T/S		
M 21.4	Column Family Databases - Cassandra									6	12	L/T/S		
M 21.5	Graph Databases - Neo4J									6	12	L/T/S		
M 21.6	Polyglot Persistence									6	12	L/T/S		
M 21.7	Group presentation									6	12	L/T/S		
M 21.8	Review									3	6	L/T/S		
M22	**Object-Oriented Programming with Java (Compulsory)**				**3**					**45**	**90**			**3 / 130**
M 22.1	Creating Java Programs									3	6	L/T/S	Midterm Exam Computer	
M 22.2	Using Data									3	6	L/T/S		

M 22.3	Using Methods									3	6	L/T/S	Exam (60 min) Final Exam Group Project and Presentation (15-30 min each group)	
M 22.4	Using Classes and Objects									3	6	L/T/S		
M 22.5	Making Decisions and Loops									3	6	L/T/S		
M 22.6	Characters, Strings, and the StringBuilder									3	6	L/T/S		
M 22.7	Arrays									3	6	L/T/S		
M 22.8	Review									3	6	L/T/S		
M 22.9	Inheritance and Interfaces									6	12	L/T/S		
M 22.10	Exception Handling									3	6	L/T/S		
M 22.11	Collections and Generics									3	6	L/T/S		
M 22.12	Introduction to Design Patterns									6	12	L/T/S		
M 22.13	Review									3	6	L/T/S		
M23	**Network Technology and Communication (Compulsory)**				**3**					**45**	**90**			**3 / 130**
M 23.1	Introduction to Computer Networks									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 23.2	The OSI and TCP/IP Models									3	6	L/T/S		
M 23.3	Application Layer Protocols									3	6	L/T/S		
M 23.4	Transport Layer Services									6	12	L/T/S		
M 23.5	Network Layer and Routing									6	12	L/T/S		
M 23.6	Data Link Layer and LANs									6	12	L/T/S		
M 23.7	Review									3	6	L/T/S		
M 23.8	Wireless Networks and Protocols									3	6	L/T/S		
M 23.9	Project proposals									6	12	L/T/S		
M 23.10	Mini Project									6	12	L/T/S		
M24	**Mathematics for Data Science and Artificial Intelligence (Compulsory)**				**3**					**45**	**90**			**3 / 130**
M 24.1	Basics Notions in Analytics Geometry									6	12	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
M 24.2	Matrix Decompositions and Approximations									6	12	L/T/S		
M 24.3	Vector Calculus									6	12	L/T/S		
M 24.4	Mathematical Programming									9	18	L/T/S		

M 24.5	Review									3	6	L/T/S		
M 24.6	When Models meet Data									3	6	L/T/S		
M 24.7	Regression									3	6	L/T/S		
M 24.8	Dimensionality Reduction									3	6	L/T/S		
M 24.9	Classification									3	6	L/T/S		
M 24.10	Review									3	6	L/T/S		
	5th Semester					**17**								
M25	**Data Visualization (Elective)***					**3**				**45**	**90**			**3 / 130**
M 25.1	Introduction									3	6	L/T/S	Midterm Exam Computer Exam (60 min) Final Exam Group Project and Presentation (15-30 min each group)	
M 25.2	R, Power BI , and Tableau Course Material									6	12	L/T/S		
M 25.3	Selecting a Chart Type									3	6	L/T/S		
M 25.4	Data Visualization and Design									3	6	L/T/S		
M 25.5	Data preparation									6	12	L/T/S		
M 25.6	Review									3	6	L/T/S		
M 25.7	Exploring Data Visually									6	12	L/T/S		
M 25.8	Explaining Visually to Influence with Data									3	6	L/T/S		
M 25.9	Data Dashboard									6	12	L/T/S		
M 25.10	Project Presentation									6	12	L/T/S		
M26	**Deep neural network (Compulsory)**					**3**				**45**	**90**			**3 / 130**
M 26.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 26.2	Shallow neural networks									3	6	L/T/S		
M 26.3	Deep neural networks									3	6	L/T/S		
M 26.4	Training neural networks									3	6	L/T/S		
M 26.5	Convolutional neural networks									3	6	L/T/S		
M 26.6	Residual networks									3	6	L/T/S		
M 26.7	Recurrent Neural Networks									3	6	L/T/S		
M 26.8	Review									3	6	L/T/S		
M 26.9	Transformer									3	6	L/T/S		

M 26.10	Generative Adversarial Networks									3	6	L/T/S		
M 26.11	Other Advanced DNN Models									3	6	L/T/S		
M 26.12	Why does deep learning work?									3	6	L/T/S		
M 26.13	Project Presentation									6	12			
M 26.14	Review									3	6	L/T/S		
M27	**Scientific Socialism (Compulsory)**					**2**				**30**	**60**			**2 / 130**
M 27.1	Introduction to Scientific Socialism									3	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (60 Min)	
M 27.2	The historical mission of the Working class									3	6	L/S		
M 27.3	Socialism and the Transition to Socialism Period									6	12	L/S		
M 27.4	Socialist democracy and the Socialist state									6	12	L/S		
M 27.5	Class - social structure and class alliances in the Transition to Socialism Period									6	12	L/S		
M 27.6	Ethnic and Religious issues in the Transition to Socialism Period									6	12	L/S		
M28	**Web design and programming (Elective)***					**3**				**45**	**90**			**3 / 130**
M 28.1	Website Overview									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 28.2	Website Design Overview									3	6	L/T/S		
M 28.3	HTML language									6	12	L/T/S		
M 28.4	Cascading Style Sheets									6	12	L/T/S		
M 28.5	Review									3	6	L/T/S		
M 28.6	Javascript									6	12	L/T/S		
M 28.7	Web Development									12	24	L/T/S		
M 28.8	Group presentation									6	12	L/T/S		
M29	**Fundamental of Quantitative Programming in C++ (Elective)***					**3**				**45**	**90**			**3 / 130**
M 29.1	Introduction of C++									3	6	L/T/S	Midterm Exam Computer Exam (60 min) Final Exam Group Project and	
M 29.2	Control structures									3	6	L/T/S		
M 29.3	Functions									3	6	L/T/S		
M 29.4	Arrays & Strings									3	6	L/T/S		
M 29.5	Class & Objects									6	12	L/T/S		

M 29.6	Review									3	6	L/T/S	Presentation (15-30 min each group)	
M 29.7	The Fixed Income Market & The Equities Market									3	6	L/T/S		
M 29.8	C++ Programming Techniques in Finance & Common Libraries for financial applications									6	12	L/T/S		
M 29.9	Numerical methods in Quantitative Financial									9	18	L/T/S		
M 29.10	Optimization and Asset/Portfolio Optimization									6	12	L/T/S		
M30	**Tools and Techniques for Business Analystics (Elective)***					**3**				**45**	**90**			**3 / 130**
M 30.1	Introduction and Overview									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 30.2	Linear Programming Models									6	12	L/T/S		
M 30.3	Transportation, Assignment, and Network Models									6	12	L/T/S		
M 30.4	Integer, Goal, and Nonlinear Programming Models									3	6	L/T/S		
M 30.5	Project Management									3	6	L/T/S		
M 30.6	Decision Analysis									6	12	L/T/S		
M 30.7	Queuing Models									6	12	L/T/S		
M 30.8	Simulation Modeling									6	12	L/T/S		
M 30.9	Forecasting Models									6	12	L/T/S		
M31	**Software Engineering (Elective)***					**3**				**45**	**90**			**3 / 130**
M 31.1	Introduction and Overview									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 31.2	Software Processes									3	6	L/T/S		
M 31.3	Agile Software Development									3	6	L/T/S		
M 31.4	Requirement Engineering									3	6	L/T/S		
M 31.5	System Modeling									6	12	L/T/S		
M 31.6	Architectural Design									3	6	L/T/S		
M 31.7	Design and Implementation									6	12	L/T/S		
M 31.8	Software Testing									3	6	L/T/S		
M 31.9	Software evolution									3	6	L/T/S		
M 31.10	Project management									6	12	L/T/S		
M 31.11	Review									6	12	L/T/S		

Students choose 4 amongs 5 elective courses

6th Semester

15

M32	**Project (Compulsory)**						**4**			**45**	**90**			**3 / 130**
M 32.1	Project introduction									3	6	T/S	Report & Presentation (60 min each group)	
M 32.2	Outline of Project									6	12	T/S		
M 32.3	Literature review									6	12	T/S		
M 32.4	Data Collection and Processing									6	12	T/S		
M 32.5	Data Analysis and Visualization									6	12	T/S		
M 32.6	Writing									6	12	T/S		
M 32.7	Review and Revision									6	12	T/S		
M 32.8	Finalization and Presentation									6	12	T/S		
M33	**Ho Chi Minh Ideology (Compulsory)**						**2**			**30**	**60**			**2 / 130**
M 33.1	Ho Chi Minh's ideology: Concept, object, research methods and learning implications									6	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (60 Min)	
M 33.2	Background, the formation and development of Ho Chi Minh's ideology									3	6	L/S		
M 33.3	Ho Chi Minh's ideology on national independence and socialism									6	12	L/S		
M 33.4	Ho Chi Minh's ideology on the Communist Party of Vietnam and the State of the people, by the people, for the people									6	12	L/S		
M 33.5	Ho Chi Minh's ideology on great national solidarity and international solidarity									6	12	L/S		
M 33.6	Ho Chi Minh's ideology on culture, ethics, and people									3	6	L/S		
M34	**AI in tourism and leisure (Elective)***						**3**			**45**	**90**			**3 / 130**
M 34.1	Course Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 34.2	NumPy, Pandas and Its Applications for Time Series Analysis									6	12	L/T/S		
M 34.3	Exploratory Time Series Data Analysis									6	12	L/T/S		
M 34.4	Stationary Time Series Models									6	12	L/T/S		
M 34.5	ARMA and ARIMA Modeling and Forecasting									6	12	L/T/S		
M 34.6	Review									3	6	L/T/S		
M 34.7	Nonstationary Time Series Models									6	12	L/T/S		
M 34.8	Financial Time Series and Related Models									6	12	L/T/S		
M 34.9	Project Presentation									3	6	L/T/S		

M35	**Natural language processing (Elective)***						**3**			**45**	**90**			**3 / 130**
M 35.1	Introduction to NLP									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 35.2	Regular Expressions, Text Normalization, Edit Distance									3	6	L/T/S		
M 35.3	N-gram Language Models									3	6	L/T/S		
M 35.4	Vector Semantics and Embeddings									3	6	L/T/S		
M 35.5	Sequence Labeling for Parts of Speech and Named Entities									3	6	L/T/S		
M 35.6	RNNs and LSTMs									3	6	L/T/S		
M 35.7	Review									3	6	L/T/S		
M 35.8	Transformers and Large Language Models									3	6	L/T/S		
M 35.9	Fine-Tuning and Masked Language Models									3	6	L/T/S		
M 35.10	Annotating Linguistic Structure									6	12	L/T/S		
M 35.11	NLP Application									6	12	L/T/S		
M 35.12	Project Presentation									3	6	L/T/S		
M 35.13	Review									3	6	L/T/S		
M36	**Information Technology Project Management (Elective)***						**3**			**45**	**90**			**3 / 130**
M 36.1	Introduction to Project Management									6	12	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 36.2	The Project Management and Information Technology Context									3	6	L/T/S		
M 36.3	The Project Management Process Groups									3	6	L/T/S		
M 36.4	Project Scope Management									3	6	L/T/S		
M 36.5	Project Schedule Management									3	6	L/T/S		
M 36.6	Project Cost Management									3	6	L/T/S		
M 36.7	Project Quality Management									3	6	L/T/S		
M 36.8	Project Resource Management									3	6	L/T/S		
M 36.9	Project Communications Management									3	6	L/T/S		
M 36.10	Project Risk Management									3	6	L/T/S		
M 36.11	Project Procurement Management									3	6	L/T/S		
M 36.12	Project Stakeholder Management									3	6	L/T/S		

M 36.13	Group Presentation									6	12	L/T/S		
M37	**Information Security (Elective)***						**3**			**45**	**90**			**3 / 130**
M 37.1	Introduction									6	12	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 37.2	Information security standards and regulations									6	12	L/T/S		
M 37.3	Cryptography and information security									12	24	L/T/S		
M 37.4	Review									3	6	L/T/S		
M 37.5	Digital Steganography and Watermarking									3	6	L/T/S		
M 37.6	Internet of Things (IoT) Security									3	6	L/T/S		
M 37.7	Cloud computing security									3	6	L/T/S		
M 37.8	Big data and AI (Artificial Intelligence) security									9	18	L/T/S		
M38	**Algorithm Design (Elective)***						**3**			**45**	**90**			**3 / 130**
M 38.1	Introduction									3	6	L/T/S	Midterm Exam Paper Exam (60 min) Final Exam Computer Exam (90 min)	
M 38.2	Basic of Algorithm Analysis									3	6	L/T/S		
M 38.3	Greedy Algorithm									6	12	L/T/S		
M 38.4	Graphs									3	6	L/T/S		
M 38.5	Divide and Conquer									6	12	L/T/S		
M 38.6	Review									3	6	L/T/S		
M 38.7	Dynamic Programming									6	12	L/T/S		
M 38.8	Network Flow									6	12	L/T/S		
M 38.9	Intractability									3	6	L/T/S		
M 38.10	Approximation Algorithm									6	12	L/T/S		

Students choose 3 amongs 5 elective courses

7th Semester **14**

M39	**Big Data Technology (Elective)***							**3**		**45**	**90**			**3 / 130**
M 39.1	Introduction to Big Data									3	6	L/T/S	Midterm Exam Computer Exam (60 min) Final Exam Computer	
M 39.2	Using Big Data in Businesses									3	6	L/T/S		
M 39.3	Technologies for Handling Big Data									3	6	L/T/S		
M 39.4	Understanding Hadoop Ecosystem									6	12	L/T/S		
M 39.5	Databases and Data Warehouses									3	6	L/T/S		

M 39.6	Using Hadoop to store data									3	6	L/T/S	Exam (90 min)	
M 39.7	Learn to Process Data using Map Reduce									3	6	L/T/S		
M 39.8	Learn Hadoop YARN Architecture									3	6	L/T/S		
M 39.9	Introduction to Spark									3	6	L/T/S		
M 39.10	Spark core									6	12	L/T/S		
M 39.11	Spark SQL									6	12	L/T/S		
M 39.12	Review									3	6	L/T/S		
M40	**Data Mining (Compulsory)**							**3**		**45**	**90**			**3 / 130**
M 40.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 40.2	Getting to Know Your Data									3	6	L/T/S		
M 40.3	Data Preprocessing									3	6	L/T/S		
M 40.4	Data Warehousing and Data Cube Technology									3	6	L/T/S		
M 40.5	Mining Frequent Patterns, Associations, and Correlations									3	6	L/T/S		
M 40.6	Advanced Pattern Mining									3	6	L/T/S		
M 40.7	Review									3	6	L/T/S		
M 40.8	Classification Models									3	6	L/T/S		
M 40.9	Advanced Classification Models									3	6	L/T/S		
M 40.10	Cluster Analysis									3	6	L/T/S		
M 40.11	Advanced Cluster Analysis									3	6	L/T/S		
M 40.12	Outlier Detection									3	6	L/T/S		
M 40.13	Data Mining and Research Frontiers									3	6	L/T/S		
M 40.14	Project Presentation									3	6	L/T/S		
M 40.15	Review									3	6	L/T/S		
M41	**Computer Vision (Elective)***							**3**		**45**	**90**			**3 / 130**
M 41.1	Introduction to Computer Vision									3	6	L/T/S	Midterm Exam Group Project	
M 41.2	Image Formation and Representation									3	6	L/T/S		

M 41.3	Image Filtering									3	6	L/T/S	and Presentation (15-30 min each group) Final Exam Group Project and Presentation (15-30 min each group)	
M 41.4	Edge Detection									3	6	L/T/S		
M 41.5	Segmentation									3	6	L/T/S		
M 41.6	Feature Extraction, Description and Matching									3	6	L/T/S		
M 41.7	Recognition									6	12	L/T/S		
M 41.8	Project									3	6	L/T/S		
M 41.9	Feature-based alignment									3	6	L/T/S		
M 41.10	Camera Calibration									3	6	L/T/S		
M 41.11	Stereo Vision									3	6	L/T/S		
M 41.12	Image stitching									3	6	L/T/S		
M 41.13	Image-based rendering									3	6	L/T/S		
M 41.14	Review									3	6	L/T/S		
M42	**Data-driven Marketing (Elective)***							**3**		**45**	**90**			**3 / 130**
M 42.1	Introduction									3	6	L/T/S	Midterm Exam Group Project and Presentation (15-30 min each group) Final Exam Group Project and Presentation (15-30 min each group)	
M 42.2	Key Performance Indicators and Visualizations									3	6	L/T/S		
M 42.3	Using regression analysis for explanatory analysis									3	6	L/T/S		
M 42.4	From Engagement to Conversion									3	6	L/T/S		
M 42.5	Product Analytics									3	6	L/T/S		
M 42.6	Recommending the Right Products									6	12	L/T/S		
M 42.7	Review									3	6	L/T/S		
M 42.8	Exploratory Analysis for Customer Behavior									3	6	L/T/S		
M 42.9	Predicting the Likelihood of Marketing Engagement									3	6	L/T/S		
M 42.10	Customer Lifetime Value									3	6	L/T/S		
M 42.11	Data Driven Customer Segmentation									3	6	L/T/S		
M 42.12	Retaining Customers									3	6	L/T/S		
M 42.13	Group presentation									3	6	L/T/S		

M 42.14	Review									3	6	L/T/S		
M43	**Communist Party History (Compulsory)**							**2**		**30**	**60**			**2 / 130**
M 43.1	The foundation of the Communist Party of Vietnam and the leads to seize power (1930-1945)									9	18	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (60 Min)	
M 43.2	The Communist Party of Vietnam led two resistance wars, completed national liberation and reunification (1945-1975)									9	18	L/S		
M 43.3	The Communist Party of Vietnam led the country in the transition to socialism and carried out DOI MOI (1975-present)									6	12	L/S		
M 43.4	Conclusion									6	12	L/S		
M44	**Cloud computing (Elective)***							**3**		**45**	**90**			**3 / 130**
M 44.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Essay Written Exam	
M 44.2	Overview of cloud computing									6	12	L/T/S		
M 44.3	Parallel data processing in the cloud									6	12	L/T/S		
M 44.4	Cloud storage system									6	12	L/T/S		
M 44.5	Review									3	6	L/T/S		
M 44.6	Safety and security									6	12	L/T/S		
M 44.7	Using cloud computing services									6	12	L/T/S		
M 44.8	Group Presentation									6	12	L/T/S		
M 44.9	Review									3	6	L/T/S		
M45	**Metaheuristics (Elective)***							**3**		**45**	**90**			**3 / 130**
M 45.1	Introduction and Overview									6	12	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Essay Written Exam	
M 45.2	Main Common Concepts for Metaheuristics									9	18	L/T/S		
M 45.3	Single-Solution Based Metaheuristics									9	18	L/T/S		
M 45.4	Population-Based Metaheuristics									9	18	L/T/S		
M 45.5	Metaheuristics for Multiobjective Optimization									9	18	L/T/S		
M 45.6	Case study									3	6	L/T/S		
M46	**Reinforcement Learning and Applications (Elective)***							**3**		**45**	**90**			**3 / 130**
M 46.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam	
M 46.2	Tabular MDP planning									3	6	L/T/S		
M 46.3	Tabular RL policy evaluation									3	6	L/T/S		

M 46.4	Q-learning									3	6	L/T/S	Group Project and Presentation (15-30 min each group)	
M 46.5	RL with function approximation									6	12	L/T/S		
M 46.6	Policy search									6	12	L/T/S		
M 46.7	Review									3	6	L/T/S		
M 46.8	Fast Learning									3	6	L/T/S		
M 46.9	Imitation Learning in Large State Spaces									3	6	L/T/S		
M 46.10	Batch Reinforcement Learning									6	12	L/T/S		
M 46.11	Project presentation									6	12	L/T/S		
M47	**Recommender Systems (Elective)***							**3**		**45**	**90**			**3 / 130**
M 47.1	Introduction									3	6	L/T/S	Midterm Exam Exam Paper (60 Min) Final Exam Group Project and Presentation (15-30 min each group)	
M 47.2	Neighborhood-Based Collaborative Filtering									3	6	L/T/S		
M 47.3	Model-Based Collaborative Filtering									3	6	L/T/S		
M 47.4	Content-Based Recommender Systems									3	6	L/T/S		
M 47.5	Knowledge-Based Recommender Systems									3	6	L/T/S		
M 47.6	Ensemble-Based and Hybrid Recommender Systems									3	6	L/T/S		
M 47.7	Evaluating Recommender Systems									3	6	L/T/S		
M 47.8	Context-Sensitive Recommender Systems									3	6	L/T/S		
M 47.9	Review									3	6	L/T/S		
M 47.10	Time- and Location-Sensitive Recommender Systems									3	6	L/T/S		
M 47.11	Structural Recommendations in Networks									3	6	L/T/S		
M 47.12	Social and Trust-Centric Recommender Systems									3	6	L/T/S		
M 47.13	Attack-Resistant Recommender Systems									3	6	L/T/S		
M 47.14	Project Presentation									3	6	L/T/S		
M 47.15	Review									3	6	L/T/S		

Students choose 3 amongs 7 elective courses

8th Semester **10**

BA	**Bachelor's Thesis**								**10**					**10 / 130**

Total number of Credits	**20**	**18**	**18**	**18**	**17**	**15**	**14**	**10**			

Annex 3

Curriculum Overview / Software Engineering

Module No.	Course name	Compulsory or elecitive?	Credit Points per Semester								Workload		Method of Teaching	Form and Duration of Examinations	weight of exam related to final grade
			1	2	3	4	5	6	7	8	Hours in Class	Hours Self-Study	i.e. lecture course, seminar		
	Semester 1														
1	**Marxist-Leninist Philosophy**	**Compulsory**	**3**								**45**	**60**			**3/130**
1.1	Chapter 1: Philosophy and the Role of Philosophy in Social Life										15	20	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
1.2	Chapter 2: Dialectical Materialism										15	20	L/S		
1.3	Chapter 3: Historical Materialism										15	20	L/S		
2	**Political Economics of Marxism and Leninism**	**Compulsory**	**2**												**2/130**
2.1	Chapter 1: Philosophy and the Role of Philosophy in Social Life										15	20	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
2.2	Chapter 2: Dialectical Materialism										15	20	L/S		
2.3	Chapter 3: Historical Materialism										15	20	L/S		
3	**Algebra**	**Compulsory**	**3**												**3/130**
3.1	Chapter 1: Philosophy and the Role of Philosophy in Social Life										15	20	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
3.2	Chapter 2: Dialectical Materialism										15	20	L/S		
3.3	Chapter 3: Historical Materialism										15	20	L/S		
4	**Foreign Language**	**Compulsory**	**3**												**3/130**

5	**Introduction to Information Technology**	**Compulsory**	**3**												**3/130**
5.1	Chapter 1 Introduction to Technology information										12	15	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
5.2	Chapter 2 Data representation and organization of computer system										12	15	L/S		
5.3	Chapter 3 Popular software										9	12	L/S		
5.4	Chapter 4. The programming language										12	18	L/S		
6	**Discrete Mathematics**	**Compulsory**	**3**												**3/130**
6.1	Chapter 1: Logic, proofs, sets, and functions										9	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
6.2	Chapter 2: Algorithms										9	12	L/S		
6.3	Chapter 3. Counting problems										9	12	L/S		
6.4	Chapter 4: Graph Theory										9	12	L/S		
6.5	Chapter 5: Trees										9	12	L/S		
	Semester 2														
1	**Fundamentals of Laws**	**Compulsory**		**3**											**3/130**
1.1	Introduction to Law										9	15	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
1.2	The Court System and Dispute Resolution										12	15	L/S		
1.3	Business Structure										12	15	L/S		
1.4	International Law										12	15	L/S		
2	**Scientific Socialism**	**Compulsory**		**2**											**2/130**
2.1	Chapter: Introduction to Scientific Socialism										6	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
2.2	Chapter 2: The Historical Mission of the Working Class										6	9	L/S		
2.3	Chapter 3: Socialism and the Transition Period to Socialism										6	9	L/S		
2.4	Chapter 4: Socialist Democracy and the Socialist State										6	9	L/S		
2.5	Chapter 5: Social Structure – Class and Class Alliances in the Transition Period to Socialism										6	9	L/S		
2.6	Chapter 6: National and Religious Issues in the Transition Period to Socialism										6	9	L/S		
2.7	Chapter 7: The Family Issue in the Transition Period to Socialism										9	9	L/S		
3	**Microeconomics 1**	**Compulsory**		**3**											**3/130**

3.1	Chapter 1. Overview										3	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
3.2	Chapter 2. Supply and Demand										6	9	L/S		
3.3	Chapter 3. Elasticity										6	9	L/S		
3.4	Chapter 4. Consumer theory										6	9	L/S		
3.5	Chapter 5. Production theory										6	9	L/S		
3.6	Chapter 6. Market structures										6	6	L/S		
3.7	Chapter 7. International Trade										6	6	L/S		
3.8	Chapter 8. The role of the Government in the market economy										6	6	L/S		
4	**Probability and Mathematical Statistics**	**Compulsory**		**3**											**3/130**
4.1	Introduction and Basic Concepts										6	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
4.2	Basic Probability										6	9	L/S		
4.3	Presentation										6	9	L/S		
4.4	Random variable Discrete and Continuous										6	9	L/S		
4.5	Sampling distribution and Estimation										6	9	L/S		
4.6	Hypothesis testing										6	9	L/S		
4.7	Regression										9	9	L/S		
5	**Foreign Language**	**Compulsory**		**3**											**3/130**
6	**Principles of Databases Systems**	**Compulsory**		**3**											**3/130**
6.1	Chapter 1. Databases and some database models										6	9	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
6.2	Chapter 2: Some languages in database mining										9	12	L/S		
6.3	Chapter 3: Design theory for relational databases										9	12	L/S		
6.4	Chapter 4: Physical data organization										9	9	L/S		
6.5	Chapter 5: Query optimization										6	9	L/S		
6.6	Chapter 6: Data Security and Integrity										6	9	L/S		
7	**Object Oriented Programming**	**Compulsory**		**3**											**3/130**
7.1	Chapter 1. Basic Concepts										9	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam	
7.2	Chapter 2. Classes and Objects										6	9	L/S		
7.3	Chapter 3. Inheritance Technique										6	9	L/S		

7.4	Chapter 4. Polymorphism										6	9	L/S	Exam Paper (90 Min)	
7.5	Chapter 5. Input and Output Streams										9	12	L/S		
7.6	Chapter 6. Exception Handling										9	9	L/S		
	Semester 3														
1	**Communist Party History**	**Compulsory**			**2**										**2/130**
1.1	Chapter I. The Birth of the Communist Party of Vietnam and its Leadership in the Struggle for Power (1930-1945)										10	10	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
1.2	Chapter 2. The Party's leadership in two wars of resistance against foreign invaders, completing national liberation and reunification of the country (1945-1975)										10	15	L/S		
1.3	Chapter 3. The Party's leadership of the entire country in the transition to socialism and the implementation of reforms (from 1975 to the present) (Part I)										10	15	L/S		
2	**Ho Chi Minh Ideology**	**Compulsory**			**2**										**2/130**
2.1	Chapter 1: Concepts, Subject Matter, Research Methods, and Significance of Studying Ho Chi Minh Thought										9	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
2.2	Chapter 2: The Foundations, Formation, and Development of Ho Chi Minh Thought										9	12	L/S		
2.3	Chapter 3: Ho Chi Minh's Thought on National Independence and Socialism										9	12	L/S		
2.4	Chapter 4: Ho Chi Minh's thought on the Communist Party of Vietnam and the State of the people, by the people, and for the people.										9	12	L/S		
2.5	Chapter 5: Ho Chi Minh's thought on national unity and international solidarity										9	12	L/S		
3	**Macroeconomics 1**	**Compulsory**			**3**										**3/130**
3.1	General Introduction: An Overview of Economics										3	3	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
3.2	Chapter 1: Measuring National Income										6	6	L/S		
3.3	Chapter 2: Measuring the Cost of Living										6	6	L/S		
3.4	Chapter 3: Production and Growth										6	6	L/S		
3.5	Chapter 4: Saving, Investing, and the Financial System										6	6	L/S		
3.6	Chapter 5: Basic Financial Instruments										3	6	L/S		
3.7	Chapter 6 : Unemployment										3	6	L/S		

3.8	Chapter 7: Money and Monetary Policy										3	6	L/S		
3.9	Chapter 8: Monetary Growth and Inflation										3	6	L/S		
3.1	Chapter 9: The Aggregate Demand – Aggregate Supply Model										3	6	L/S		
3.11	Chapter 10: The Impact of Monetary and Fiscal Policy on Aggregate Demand										3	3	L/S		
4	**Foreign Language**	**Compulsory**			**3**										**3/130**
5	**Data Structure and Algorithm**	**Compulsory**			**3**										**3/130**
5.1	Chapter 1: Overview of data structure and algorithm										6	9	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
5.2	Chapter 2: Array data structure										6	9	L/S		
5.3	Chapter 3. List data structure										9	12	L/S		
5.4	Chapter 4: Tree data structure										9	12	L/S		
5.5	Chapter 5: Graph data structures										6	9	L/S		
5.6	Chapter 6: Data organization										9	9	L/S		
6	**Principles of Programming**	**Compulsory**			**3**										**3/130**
6.1	Chapter 1. Basic concepts of programming										3	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
6.2	Chapter 2. Basic concepts of the C programming language										6	9	L/S		
6.3	Chapter 3: Basic data types and operators in C										3	6	L/S		
6.4	Chapter 4: Chapter 4: Data I/O										6	6	L/S		
6.5	Chapter 5: Control Structures in C										3	6	L/S		
6.6	Chapter 6: Function in C										6	6	L/S		
6.7	Chapter 7: Pointer in C										6	6	L/S		
6.8	Chapter 8: Structure in C										6	6	L/S		
6.9	Chapter 9: File in C										6	9	L/S		
7	**Calculus**	**Compulsory**			**3**										**3/130**
7.1	Chapter 1. Basic concepts										6	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
7.2	Chapter 2. Interpolation by Polynomials										6	9	L/S		
7.3	Chapter 3. Approximation of functions by the method of least squares										6	9	L/S		
7.4	Chapter 4. Approximate Derivatives and Integrations										6	9	L/S		
7.5	Chapter 5. Nonlinear Equations										6	9	L/S		

7.6	Chapter 6. Systems of Linear Equations										6	9	L/S		
7.7	Chapter 7. Ordinary Differential Equations										9	9	L/S		
8	**Operating Systems**	**Compulsory**			**3**										**3/130**
8.1	Chapter 1: Overview of Operating Systems										6	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
8.2	Chapter 2: Process Management										6	9	L/S		
8.3	Chapter 3: Memory Management										6	9	L/S		
8.4	Chapter 4: Storage Structure										6	9	L/S		
8.5	Chapter 5: File Management										6	9	L/S		
8.6	Chapter 6: Input/Output Management										6	9	L/S		
8.7	Chapter 7: System Protection and Security										9	9	L/S		
9	**English for IT**	**Compulsory**			**3**										**3/130**
	Semester 4														
1	**Software Design and Architecture**	**Compulsory**				**3**									**3/130**
1.1	CHAPTER 1 OVERVIEW OF SYSTEMS DESIGN ANALYSIS										12	15	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
1.2	CHAPTER 2 SYSTEM SURVEY AND INITIALIZATION OF SYSTEM DEVELOPMENT PROJECT										12	15	L/S		
1.3	CHAPTER 3 OBJECT ORIENTED SYSTEM ANALYSIS										12	15	L/S		
1.4	CHAPTER 4 OBJECT ORIENTED SYSTEM DESIGN										12	15	L/S		
2	**Database Management Systems**	**Compulsory**				**3**									**3/130**
2.1	Chapter 1. Introduction to SQL Server										9	15	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
2.2	Chapter 2. Working with databases in SQL Server										12	15	L/S		
2.3	Chapter 3. Working with Transact-SQL (T-SQL)										12	15	L/S		
2.4	Chapter 4: Administration in Microsoft SQL Server										12	15	L/S		
3	**Information Technology Project Management**	**Compulsory**				**3**									**3/130**
3.1	Chapter 1: Overview of IT project management										6	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
3.2	Chapter 2: IT Project Planning										12	12	L/S		
3.3	Chapter 3: Organization of IT project implementation										9	12	L/S		
3.4	Chapter 4: IT Project Management										9	12	L/S		
3.5	Chapter 5: Practice of IT Project Management with MS Project Tools										9	12	L/S		

4	**Python Programming**	**Elective**				**3**									**3/130**
4.1	Chapter 1: Introduction to Python										6	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
4.2	Chapter 2: Data types in Python										6	9	L/S		
4.3	Chapter 3: Control structures										6	9	L/S		
4.4	Chapter 4: Function, Modules, Packages in Python										6	9	L/S		
4.5	Chapter 5: File handling										6	9	L/S		
4.6	Chapter 6: Python Object Oriented										6	9	L/S		
4.7	Chapter 7: Data Science Using Python										9	9	L/S		
5	**Website design and programming**	**Elective**				**3**									**3/130**
5.1	Chapter 1. Web Development Overview										9	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
5.2	Chapter 2. Client-side										9	12	L/S		
5.3	Chapter 3. REST and JSON										9	12	L/S		
5.4	Chapter 4. Server-Side Technologies										12	12	L/S		
5.5	Chapter 5. Other issues										6	12	L/S		
6	**Java Programming**	**Elective**				**3**									**3/130**
6.1	Chapter 1: Overview of JAVA Programming										5	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
6.2	Chapter 2: Basic JAVA Programming										5	6	L/S		
6.3	Chapter 3: Driver Programming										5	6	L/S		
6.4	Chapter 4: Function Programming										5	6	L/S		
6.5	Chapter 5: Object-Oriented Programming										9	9	L/S		
6.6	Chapter 6: Input-Output Programming										3	6	L/S		
6.7	Chapter 7: Parallel Programming										3	9	L/S		
6.8	Chapter 8: Generic Programming										5	6	L/S		
6.9	Chapter 9: Lamba&Streams										5	6	L/S		
	Semester 5														
1	**Business Analysis**	**Compulsory**					**3**								**3/130**
1.1	Chapter 1 Overview of Business analysis										6	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam	
1.2	Chapter 2 Business Analysis Planning and Monitoring										6	9	L/S		
1.3	Chapter 3 Elicitation and Colaboration										6	9	L/S		

1.4	Chapter 4 Requirements Life Cycle Management											6	9	L/S	Exam Paper (90 Min)	
1.5	Chapter 5 Strategy analysis											6	9	L/S		
1.6	Chapter 6 Requirement Analysis and Design Definition											9	9	L/S		
1.7	Chapter 7 Solution Evaluation											6	9	L/S		
2	**System Analysis and Design**	**Compulsory**					**3**									**3/130**
2.1	Chapter 1 Overview of System Analysis and Design											12	15	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
2.2	Chapter 2 Survey of current situation and establishment of requirement											12	15	L/S		
2.3	Chapter 3 Object oriented system analysis											12	15	L/S		
2.4	Chapter 4 Object-oriented system design											9	15	L/S		
3	**Software and Database Security**	**Compulsory**					**3**									**3/130**
3.1	Chapter 1: Principles of security											12	15	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
3.2	Chapter 2: Database Security											12	15	L/S		
3.3	Chapter 3: Software Security											12	15	L/S		
4	**Practical Training**	**Compulsory**					**4**									**4/130**
4.1	Introduction to Business											15	20	L/S	Write Report	
4.2	Understanding the business environment											15	20	L/S		
4.3	Learning about ongoing business projects											15	20	L/S		
4.4	Write Report											15	20	L/S		
5	**Parallel and Distributed Programming**	**Elective**					**3**									**3/130**
5.1	Basic concepts of paralell and distributed programming											9		L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
5.2	Multi threads parallel programming model											9		L/S		
5.3	OpenMP programming											9		L/S		
5.4	MPI programming											9		L/S		
5.5	CUDA programming											9		L/S		
6	**Application of AI in business and management**	**Elective**					**3**									**3/130**
6.1	Chapter 1. Overview of artificial intelligence											12		L/S	Midterm Exam Exam Paper (60 Min) Final Exam	
6.2	Chapter 2. Solving problems of artificial intelligence and data science											9		L/S		

6.3	Chapter 3. Machine learning and deep learning methods										12		L/S	Exam Paper (90 Min)	
6.4	Chapter 4. Building models and developing AI applications in business and management										12		L/S		
7	**Data Analysis Programming**	**Elective**					**3**								**3/130**
7.1	Chapter 1. General Introduction to Data										6	9	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
7.2	Chapter 2. The R Language										6	12	L/S		
7.3	Chapter 3. Hypothesis Testing										6	9	L/S		
7.4	Chapter 4. Descriptive Statistical Analysis										9	9	L/S		
7.5	Chapter 5. Regression Analysis										9	9			
7.6	Chapter 6. Advanced Analytical Methods										9	12	L/S		
	Semester 6														
1	**Software Testing and Quality Assurrance**	**Compulsory**						**3**							**3/130**
1.1	Chapter 1. Overview of mobile programming										9	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
1.2	Chapter 2. Software testing techniques										9	12	L/S		
1.3	Chapter 3. Testing levels										9	12	L/S		
1.4	Chapter 4. Software errors management										9	12	L/S		
1.5	Chapter 5. Automation testing										9	12			
2	**Software Engineering**	**Compulsory**						**3**							**3/130**
2.1	Chapter 1: Overview of Software Engineering										3	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
2.2	Chapter 2: Software Requirements Specification										6	9	L/S		
2.3	Chapter 3: Software Design Fundamentals										6	6	L/S		
2.4	Chapter 4: Functional Analysis and Design										6	6	L/S		
2.5	Chapter 5: Object-Oriented Analysis and Design										6	6	L/S		
2.6	Chapter 6: Real-Time Analysis and Design										6	6	L/S		
2.7	Chapter 7: Software Testing										6	9	L/S		
2.8	Chapter 8: Software Maintenance										3	6	L/S		
2.9	Chapter 9: Software Project Management										3	6	L/S		
3	**Game Programming**	**Elective**						**3**							**3/130**
3.1	Chapter 1: Foundations of Game Development										9	15	L/S		

3.2	Chapter 2: 2D Game Development										12	15	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
3.3	Chapter 3: 3D Game Development										12	15	L/S		
3.4	Chapter 4: Advanced Topics and Project										12	15	L/S		
4	**Business Management 1**	**Elective**						**3**							**3/130**
4.1	Lesson 1. Introduction to Business Administration										6	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
4.2	Lesson 2. The Business Environment										6	9	L/S		
4.3	Lesson 3. Business and Business Management										9	9	L/S		
4.4	Lesson 4. Subjects and Human Resources										6	9	L/S		
4.5	Lesson 5. Social Responsibility and Business Ethics										6	9	L/S		
4.6	Lesson 6. Managing Business Operations										6	9	L/S		
4.7	Lesson 7. Business Results and Efficiency										6	9	L/S		
5	**Human-Computer Interaction**	**Elective**						**3**							**3/130**
5.1	Chapter 1: Introduction, basic concept, and definitions										3	6	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
5.2	Chapter 2: Interaction Design										6	9	L/S		
5.3	Chapter 3: HCI in software process										6	9	L/S		
5.4	Chapter 4: Design rules										6	9	L/S		
5.5	Chapter 5: Implementation support										6	9	L/S		
5.6	Chapter 6: Evaluation techniques										6	6	L/S		
5.7	Chapter 7: Universal design										6	6	L/S		
5.8	Chapter 8: User support										6	6	L/S		
6	**Application Programming**	**Elective**						**3**							**3/130**
6.1	Chapter 1: Overview										9	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
6.2	Chapter 2: Programming Languages										9	12	L/S		
6.3	Chapter 3: Advanced Controls Dialog Box										9	12	L/S		
6.4	Chapter 4: Connecting Retrieval to a Database										9	12	L/S		
6.5	Chapter 5 Reports										9	12	L/S		
	Semester 7														
1	**Mobile Applications Development**	**Elective**							**3**						**3/130**

1.1	Chapter 1. Overview of mobile programming										9	12	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
1.2	Chapter 2. Building the user interface										9	12	L/S		
1.3	Chapter 3. Data storage										9	12	L/S		
1.4	Chapter 4. Advanced programming										9	12	L/S		
1.5	Chapter 5. Application development and distribution										9	12	L/S		
2	**Integration and Deployment Management**	**Elective**							**3**						**3/130**
2.1	Chapter 1: Introduction, basic concept, and definitions										15	15	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
2.2	Chapter 2: Working with the CI Environment and Source Control										15	15	L/S		
2.3	Chapter 3: Testing A Node JS and MongoDB Web Application										5	10	L/S		
2.4	Chapter 3: A C# .NET Core and Postgres SQL Web App										5	10	L/S		
2.5	Chapter 3: Testing Testing a Web API										5	10	L/S		
3	**Development of Open Source Software and Applications**	**Elective**							**3**						**3/130**
3.1	Lecture 1: Overview of Open Source Software										12	15	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
3.2	Lecture 2: Open Source Software License										12	15	L/S		
3.3	Lecture 3: Some Open Source Software										9	15	L/S		
3.4	Lecture 4: Open Source Software Development										12	15	L/S		
4	**Service Oriented Software Development**	**Elective**							**3**						**3/130**
4.1	Chapter 1. Basic concepts and techniques										9	15	L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
4.2	Chapter 2. Service Oriented Architecture (SOA)										12	15	L/S		
4.3	Chapter 3. Web Services										12	15	L/S		
4.4	Chapter 4. Building A Web Service Oriented System										12	15	L/S		
5	**Cloud Computing**	**Elective**							**3**						**3/130**
5.1	Introduction												L/S	Midterm Exam Exam Paper (60 Min) Final Exam Exam Paper (90 Min)	
5.2	Overview of cloud computing												L/S		
5.3	Parallel data processing in the cloud												L/S		
5.4	Cloud storage system												L/S		
5.5	Review												L/S		
5.6	Safety and security												L/S		

5.7	Using cloud computing services												L/S		
5.8	Group Presentation												L/S		
5.9	Review												L/S		
	Semester 8														
1	**Graduation thesis**	**Compulsory**								**10**					**10/130**
total			**17**	**20**	**25**	**18**	**22**	**18**	**15**	**10**					