



LMPI - N°573901-EPP-1-2016-1-IT-EPPKA2-CBHE-JP

"Licence, Master professionnels pour le développement, l'administration, la gestion, la protection des systèmes et réseaux informatiques dans les entreprises en Moldavie, au Kazakhstan, au Vietnam »

Accreditation file

	Licence			
	Pro	Master		
Ho Chi Minh	non	création		
Hanoi Agriculture	création	rénové		
Hanoi Science et technology	rénové	rénové		

rentrée 1ere session étudiants: sep2018

Grade:	Bachelor	Domaine:	CyberSecurity
Mention:	•••		

Université:	VNUA	University Chair:	
Date de conception:			

Author:			
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PROTOCOL OF PROJECT DOCUMENT VALIDATION

PROCES VERBAL DE VALIDATION DE DOCUMENT DU PROJET

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Function/fonction	Professor. Local Coordinator at University of Vigo		

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I. Context of the degree

a) In which context you have a project to create the new curricula (aims, motifs...):

In recent years, the demand for human resources in the field of information technology has increased strongly. In particular, courses in network security engineering are being pursued by many young people. It is the fact that Vietnam is one of the top 10 countries detected by cybercrime in 2016 (report by network security company Symantec, the United States). Many individuals, organizations and enterprises in Vietnam are victims of black hackers and the number of attacked networks is constantly increasing every day. That is the reason why companies and enterprises are trying to strengthen and protect their assets on the Internet by seeking high quality human resources for information technology protection. Creating the new curricula in Cybersecurity in Vietnam is necessary to adapt the demand of human resources in a period of flat world.

b) List the potential jobs covered by the new curriculum, refer to the official job classification

Students will be able to apply for a job at IT companies in areas like game creation, software or network system, etc. As network security experts, they will be able to work in many fields beyond IT such as banking, education, online services, e-commerce, hotels, aviation, defense, health, etc. Network security professionals do the work of protecting information, data, systems, and managing information. Students in the field of network security can choose website administration, website application testing, security analysis information, working with software or database.

c) Indicate the predictions for the professional integration of young graduates.

Graduates in the Cybersecurity Program who have ability to work in specialized units of Cyber Security, Information Technology and Network as well as IT enterprises such as government agencies, financial, banking, insurance and telecommunications agencies, fulfilling job positions like:

- Server and network security management
- Database security
- Analysis, consulting, and design of information system to ensure security.
- Testing and evaluation of information security for networks and system.
- Scan of vulnerabilities and handling information security incidents
- Programming and application development to ensure information security.

After a period of experience, the Cybersecurity bachelor will have the capabilities to handle information security responsibilities, such as team leader or director of information security, as well as having the capacity to work as a researcher and lecturer on information safety at research institutes, centers and training institutions.

Each year, 30-40 students of the new program will join the IT labour market after graduating

d) Indicate the origin of the students admitted, their number, and the methods of recruitment.

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Candidates who graduated from high school in Vietnam will register and select the combination of subjects required in the information security major, for example Group A1 includes Maths, Physics and Chemistry, etc. Based on the results of high school graduation exams and other admission method, the candidates will be admitted if they meet the requirements of the Ministry of Education and Training in general, and VNUA in particular. The maximum number the Faculty of Information Technoloy can recruit each school year is about 120-150 students, thus 30-40 students in Cybersecurity program can be admitted.

(e) Indicate whether the possibility of access to adult learners as part of lifelong learning is offered.

The new degree is for everyone who is interested in Cybersecurity, especially for IT engineers having information technology background. Adults who are studying other Information Technology program easily follow Cybersecurity program because they have basic IT knowledge while studying the new degree, only some subjects are requested.

(f) Indicate the possible pursuit of studies.

With the knowledge and skills equipped, students can continue to study at the graduate level in the country and abroad in the field of information security, security and information technology.

g) *Indicate the modalities of composition of differentiated paths if necessary.* There is no differentiated paths in the program.

II. General description of the curriculum

Training outcomes	Description
Disciplinary knowledge	Engineer on Data & Application security (B.Sc.)
Specific Skills	 SC13. Skill in conducting vulnerability scans, recognizing and categorizing vulnerabilities in security systems. SC14. To understand and to apply the up-to-date methods, tools, software and techniques to analyze risks, threats and protect the system. SC15. The ability to understand security demands and design and implement software/hardware security solutions SC16. Skill in determining how a security system should work (including its resilience and dependability capabilities) and how changes in conditions, operations, or the environment will affect these outcomes. SC17. The ability to know, understand and apply code analysis techniques. SC18. The ability to know, understand and apply security event

II.1. Description of training outcomes:

	 correlation techniques and tools. SC19. Skill in secure test plan design (e. g. unit, integration, system, acceptance). SC20. Skill in developing, testing, and implementing network infrastructure contingency and recovery plans. SC21. Skill in analysing and predicting trends in security aspects. SC22. Skill in analysing anomalous code as malicious or benign. SC23. The ability to know, understand and apply binary analysis
	techniques and tools. SC24. Skill in performing damage assessments. SC25. Ability to evaluate risks (risk assessment) SC26. To design/establish security policies, privacy policies and standards SC27. To make employees aware about corporate security policies and standards SC28. To design, develop and report monitoring indicators according
	 SC28. To design, develop and report monitoring indicators according to policies and standards SC29. Ability to describe and illustrate the risks, threats and solutions SC30. Skill in technical writing, reviewing and editing cyber-related Intelligence/assessment products from multiple sources. SC31. The ability to know, understand and apply database security techniques. SC32. The ability to know, understand and apply cloud computing security solutions.
Cross-curricular competencies	C1 Capacity of oral communication C2 Teamwork capacity C3 Problem solving capacity C4 Scheduling and planning ability

II.2. Decomposition of curricula in semesters

Fr/ bachelor = 3ans (180 ECTS) – Master =2 yeas (120 ECTS) VN: bachelor=4 years, Master = 2 years 1 year of studies = 60 ECTS

Bachelor in Information Technology with a track in Cybersecurity

Year	Semester	Title of semester (*)	EU Educational units
			UE1. Principle of Marxism and Leninism 1 (4 ECTS) UE2. Basics of informatics (6 ECTS)

			UE3. Physics for informatics (6 ECTS)
			UE4. Linear algebra (6 ECTS)
			UE5. Calculus (6 ECTS)
			UE6. Introduction to laws (4ECTS)
Year 1	S1	Mandatory (32 ECTS)	UE7. An Introduction to CEFR-Based Tests (2ECTS).
			Note: Not included in the total accumulated credits
			UE8. General physical education (2ECTS). Note: Not
			included in the total accumulated credits
			LIF9 Defense Education 1(6FCTS) Note: Not included
			in the total accumulated credits
			UF10 Principle of Marvism and Leninism 9 (6 ECTS)
			UE10. I Interpreted Matxishi and Leminishi 2 (0 EC15)
			UE11. Flobability and Statistics (0 EC15)
			UE12. Discrete mainematics (0 EC15)
			UE13. Computer architectures and Micro-processing (o
			UE14. Databases (b EC15)
			UE15. Programming Techniques (6 EC1S)
		Mandatory (36 ECTS)	UE16. Numerical methods (4 ECTS)
		Mandatory (00 LC 19)	UE17. Principles of Accounting (6 ECTS)
			UE18. English 0 (4 ECTS)
Year 1	S2		UE19. Athletics, aerobic gymnastics, football, volleyball,
			basketball, badminton, chess, dance sport, swimming (2
			ECTS). Note: Not included in the total accumulated
			credits
			UE20. Soft Skills: 90 periods (Choose 3 out of 6
		Optional (4 ECTS)	modules, 30 lessons per session: Communication Skills,
			Leadership Skills, Self management Skills, Job Search
			Skills, Teamwork Skills, International integration skills).
			Note: Note: Not included in the total accumulated credits
			UE21. Defense Education 2 (4ECTS). Note: Not
			included in the total accumulated credits
			UE22. English 1 (6 ECTS)
			UE23. Database security (4 ECTS)
			UE24. Introduction to Software Engineering (4 ECTS)
			UE25 Data structures and Algorithms (6 ECTS)
			UE96 Practice for Data structures and Algorithms (9
	S 3	Mandatory (34 ECTS)	FCTS)
			UF97 Object-Oriented Programming (6 FCTS)
			UE98 System analysis and design (6 ECTS)
			UE20. System analysis and design (0 ECTS) UE90. Defense. Education 2 (6ECTS) Note: Not
V O			included in the total accumulated gradite
Year 2			LIE 20, E 1, 1, 0, (C ECTE)
		Mandatory (32 ECTS)	UE30. English 2 (0 EU15)
		5	UE31. Principles of operating systems (0 EC15)
			UE32. Computer networks (6 EC15)
			UE33. Detecting Security Bugs and Vulnerabilities in
	S 4		Software (4 ECTS)
			UE34. Algorithm Complexity (4 ECTS)
			UE35. Web Application Development (6 ECTS)
		$O_{\rm T}$ tion of (6 ECTS)	UE36. JAVA Programming (6 ECTS)
		Optional (0 EC I S)	UE37. Computer network design (6 ECTS)
		Mandatory (28 ECTS)	UE38. English for ICT studies (4 ECTS)
		1741104001 y (20 LC 10)	UE39. Ho Chi Minh Ideology (4 ECTS)
	.		UE40. Modelling and Control (4 ECTS)
	S 5		UE41. Information security (4 ECTS)
			UF42. Cryptology and Applications (6 ECTS)
Year 3			UF43. Linux and Open Software (6 ECTS)

			UE44. Web back-end Development (6 ECTS)		
		Optional (6 ECTS)	UE45. Network administration (6 ECTS)		
			UE46. Revolutionary guideline of Vietnamese		
			Communist Party (6 ECTS)		
		Mandatory (26 ECTS)	UE47. Environmental Management (4 ECTS)		
			UE48. Economics of Trade and Services (4 ECTS)		
			UE49. Malicious code analysis (4 ECTS)		
	S 6		UE50. Strategic Security Management (4ECTS)		
			UE51. Information System Security Audit (4 ECTS)		
			UE52. Mobile Application Development (6 ECTS)		
		Optional (6 ECTS)	UE53. Network and operating system security		
NZ O		-	(6 ECTS)		
Year 3					
		Mandatory (24 ECTS)	UE54. Internship (24 ECTS)		
	07				
	57		UE55. Web Application Security and Testing (6 ECTS)		
Year 4		Optional (6 ECTS)	UE56. Network security monitoring (6 ECTS)		
	S 8	Mandatory (20 ECTS)	UE57. Graduation thesis (20 ECTS)		

II.3 Description of EU (educational units)

EU semester 1 (32 ECTS)

EU	Goals	Modules	ECT S	Lecture s (hours)	TP (h.)	TL (h.)	Pers. work	Tota l
UE1	Principles of Marxism and Leninism 1 (Mandatory)	 M1: Introduction to basic principles of Marxism and Leninism M2: Dialectical materialism M3: Materialist dialectics M4: Historical materialism 	4	30		0	60	90
UE2	Introduction to Informatics (Mandatory)	M1: Information and information representation M2: Computer organization M3: Computer software and operating system M4: Computer networks and the Internet M5: The social issues of information technology M6: MS Word & MS PowerPoint M7: MS Excel M8: Algorithms M9: Programming	6	45		0	90	135

		M1: Units and Measurements M2: Mechanics M3: Electrical Field					
		M4: Electrical Currents and Electrical Sources					
		M5: Electrical Materials					
UE3 (Physics for informatics (Mandatory)	M6: Introduction to Electronic Circuits M7: Magnetic field, Magnetic induction M8: Electromagnetic Field and Waves M9: Optical information M10: Introduction to Sensors	6	30	15	90	135
		and Applications M11: Introduction to an Electronic Circuits Design Software with Proteus software					
UE4	Linear algebra (Mandatory)	M1: Matrix Algebra and Determinants M2: Systems of linear equations M3: Vector spaces M4: Diagonalization	6	45	0	90	135
UE5	Calculus (Mandatory)	M4: Diagonalization M1: Functions of one variable M2: Integration of functions of one variable M3: Sequenses and series of functios M4: Multivariable functions M5: Multiple integral M6: Differential equations	6	45	0	90	135
UE6	Introduction to laws (Mandatory)	M1: Fundamental theoretical issues about the State and Law M2: Fundamental issues about the State and Law of the Socialist Republic of Vietnam M3: Basic contents of the Civil Law and the Criminal Law M4: Basic contents of the Economic Law, Labor Law, Marriage and Family Law M5: Basic contents of the Administrative Law and the	4	30	0	60	90

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		Anti-corruption Law					
	An Introduction to	M1. Section A – Grammar	2	15	0	30	45
UE7	CEFR - Based	and Reading					
UE/	Tests	M2. Section B - Listening					
	(Mandatory)						
	General physical		2	7.5	7.5	30	45
UE8	education						
	(Mandatory)						
UEO	D efense Education		6	45	0	00	195
UL9	1		U	40	0	90	199

EU semester 2 (40 ECTS)

EU	Goals	Modules	ECTS	Lecture s (hours)	TP (h.)	TL (h.)	Pers. work	Tota l
UE10	Principle of Marxism and Leninism 2	M1: Theory of value M2: Theory of surplus value M3: Theory of capitalism ate monopoly capitalism M4: The Historical mission of the working class and the	6	45		0	90	135
	(Mandatory)	socialist revolution M5: The social and political issues in the process of socialist revolution M6: Socialism - reality and prospects						
UE11	Probability and Statistics (Mandatory)	 M1: Descriptive statistics M2: Probability M3: Random variables M4: Parameter estimation M5: Hypothesis testing M6: Simple linear regression 	6	45		0	90	135
UE12	Discrete mathematics (Mandatory)	M1: Funtions of one variable M2: Integration of functions of one variable M3: Sequenses and series of funtios M4: Multivariable functions	6	45		0	90	135

		M5: Multiple integral M6: Differential equations					
UE13	Computer architectures and Micro-processing (Mandatory)	 M1: General introduction M2: Computer system M3: Data representation and computer arithmetic M4: Central Processor Unit M5: Memory System M6: Input-output system M7: The basic structure of the 8088 M8: 8088 with memory M9: 8088 with Input-output system 	6	45	0	90	135
UE 14	Databases (Mandatory)	M1: Overview of database M2: E/R Diagrams M3 : The Relational Data Model M4: Design Theory for relational databases M5: SQL M6: Query Optimization Basics M7: Data integrity and security	6	45	0	90	135
UE15	Programming Techniques (Mandatory)	M1: Overview of programming techniques M2: Introduction to the C programming language M3: Input/Output statements and control structures M4: Structured data types M5: Function M6: Pointer data type M7: File data type	6	30	15	90	135
UE16	Numerical methods (Optional)	M1: Approximation and errors M2: The approximate real value of a hidden equation M3: Approximate linear system of linear algebra M4: Interpolating polynomial and least squares method	4	30	0	60	90

	1			1	1	1	r	
		M5: Approximate						
		derivative and integral						
		M6: The approximation of						
		the normal differential						
		M1: Nature and object of						
		book keeping operation						
		M2: Financial report						
	Principles of	M3: Evaluation and	2	2.0			0.0	105
UE17	Accounting	Inventory	6	30		15	90	135
	(Optional)	M4: Accounting Methods						
		and double entry						
		M5: Valuation						
		M1: Lot's hogin						
		M9: All about mo						
	English ()	M2. Tall me about your						
UE18	(Mandatory)	day	4	30		0	60	90
	(Wiangatory)	M4. Lot's go shopping						
		M4. Let s go shopping M5. My family						
	Athletics perobic							
	avmnastics							
	football							
	vollevball							
LIE19	basketball		9	0		15	30	45
CL15	badminton chess		2	Ŭ		10	00	10
	dance sport							
	swimming							
	(Optional 2/9)							
	Soft skill							
	Soft Skills: 90							
	periods (Choose							
	3 out of 6							
	modules. 30							
	lessons per							
	session:							
	Communication							
UE20	Skills, Leadership							
	Skills, Self							
	Management							
	Skills, Job Search							
	Skills, Teamwork							
	Skills,							
	International							
	integration skills)							
	(Optional 3/6)							
I IDO1	Defense			0.0		0	60	0.0
UE21	Education 2		4	30		0	60	90

EU	Goals	Modules	ECTS	s (hours)	TP (h)	TL (h)	Pers. work
UE22	English 1 (Mandatory)	M1: It's great job! M2: Great vacation M3: Cities around the world M4: Wildlife M5: All about sports	6	45		0	90
UE23	Database security (Mandatory)	M1: Overview of database security M2: Access control M3: Inference control M4: Flow control and data encryption M5: Advanced topics	4	30		0	60
UE24	Introduction to Software Engineering (Mandatory)	M1: Introduction M2: Software processes M3: Requirements engineering M4 : Design Software M5: Software testing M6: Software evolution	4	30		0	60
UE25	Data structures and Algorithms (Mandatory)	M1: Data structures and Algorithms M2: Arrays and Lists M3: Linked list M4: Tree M5: Graph M6: Sort M7: Search	6	45		0	90
UE26	Practice for Data structures and Algorithms	M1: C/C++ programming with stack data structures, queues, single linked list, double linked list, binary tree, graph.	2	0		15	30

M2: C/++ programming

M1: C ++ programming

M2: Object-oriented

algorithms.

language

with sorting and searching

6

30

15

90

(Mandatory)

Object-Oriented

Programming

(Mandatory)

UE27

EU semester 3 (34 ECTS)

Tota

1

135

90

90

135

45

135

		programming methods M3: Object-oriented programming analysis and design M4: Class and object M5: Function overloading and operator overloading M6: Constructor and destructor M7: Inheritance M8: Dynamic polymorphism, virtual function					
UE28	System analysis and design (Mandatory)	M1: Overview of System analysis and design M2: Situational survey and demand analysis M3: Object-oriented system analysis M4: object-oriented system design	6	45	0	90	135
UE29	Defense Education 3		6	45	0	90	135

EU semester 4 (38 ECTS)

EU	Goals	Modules	ECTS	Lecture s (hours)	TP (h.)	TL (h.)	Pers. work	Tota l
UE30	English 2 (Mandatory)	M1: Good luck, bad luck M2: My favourite things <i>M3:</i> Memorable experiences M4: I love chocolate M5: How can I help?	6	45		0	90	135
UE31	Principles of operating systems (Mandatory)	M1: General introduction M2: Operating system structure M3: Process M4: Thread M5: Process synchronization M6: CPU scheduling M7: Deadlock M8: Main memory	6	45		0	90	135

		M9: Virtual memory M10: I/O management and disk scheduling M11: File management					
UE32	Computer networks (Mandatory)	M1: Introduction to computer networks M2: Application layer M3: Transport layer M4: Network layer M5: Data link layer M6: Physical layer	6	37.5	7.5	90	135
UE33	Detecting Security Bugs and Vulnerabilities in Software (Mandatory)	M1: Overview M2: General Safety Information M3: Buffer Overflows M4: Unvalidated Input M5: TAIN Analysis M6: The vulnerabilities in web programming M7: Vulnerabilities in mobile programming	4	30	0	60	90
UE34	Algorithms and Complexity (Mandatory)	M1: Introduction to algorithms and complexity M2: The complexity of some algorithms M3: NP-complete & NP- hard	4	30	0	60	90
UE35	Web Application Development (Mandatory)	M1: Overview the Internet and WWW M2: HyperText Markup Language (HTML) M3: Cascading Style Sheets (CSS) M4 : JavaScript for Front- end M5: The Document Object Model (DOM) M6: Front-end Frameworks	6	30	15	90	135
UE36	JAVA Programming (Optional)	M1: Overview of Java programming language M2: The basic programming structures in Java M3: Classes and Objects M4: Object-oriented features in Java	6	30	15	90	135

		M5: Streams and files M6: Programming with database M7: Designing user interfaces					
UE37	Computer network design (Optional)	M1: Identify the needs and objectives of clients M2: Logical network design M3: Physical network design M4: Testing, Optimization, Writing Network design documentation	6	30	15	90	135

EU semester 5 (34 ECTS)

EU	Goals	Modules	ECTS	Lecture s (hours)	TP (h)	TL (h.)	Pers. work	Tota l
UE38	English for ICT studies (Mandatory)	M1: ICT in the workplaceM2: Introduction to ICTsystemsM3: ICT in educationM4: The InternetM5: Software development	4	30		0	60	90
UE39	Ho Chi Minh Ideology (Mandatory)	M1: Establishment, formation and development of Ho Chi Minh ideology M2: Ho Chi Minh's thoughts on national issues and the revolution of national liberation M3: Ho Chi Minh ideology of socialism and the transitional road to socialism in Vietnam M4: Ho Chi Minh ideology of the Communist Party of Vietnam M5: Ho Chi Minh's thoughts on the great national unity and international unity M6: Ho Chi Minh's idea of building the state of the people, by the people, for	4	30		0	60	90

		the people M7: Ho Chi Minh's thoughts on culture, morality and building new people					
UE40	Modelling and Control (Mandatory)	M1: The Basics of System Modelling M2: System model M3: Simulation method M4: Computer methods for modelling automated control systems M5: Continuous system simulation M6: Modelling of random systems M7: Simulate the queue system M8: Application Ident Tool in matlab to build a modelling automated control system	4	22.5	7.5	60	90
UE41	Information security (Mandatory)	M1: Overview of Information security M2: Confidentiality M3: Integrity M4: Trust	4	30	0	60	90
UE42	Cryptology and Applications (Mandatory)	 M1: General introduction M2: Full secret encryption M3: Symmetric encryption M4: Message authentication code M4: Hash functions and applications M5: Build symmetric code in reality M6: Key management M7: Public encryption M8: Electronic Signature 	6	45	0	90	135
UE43	Linux and Open Software (Mandatory)	M1: Introduction of open source software M2: Introduction to Linux operating system M3: Exploiting open source software M4: Building and developing open source	6	30	15	90	135

		software					
UE44	Web back-end Development (Optional)	M1: Overview of Web server and web back-end application M2: Statefull and stateless architectures M3: Asynchronous and parallel in HTTP Request processing M4: Working with Database management systems M5: Challenges in building a big web back-end development	6	30	15	90	135
UE45	Network administration (Optional)	M1: Windows Server 2012: Introduction, Install and Configuration M2: Active Directory Domain Services M3: IPv4 M4: Dynamic Host Configuration Protocol M5: Domain Name System M6: IPv6 M7: Group Policy and security configuration	6	30	15	90	135

EU semester 6 (32 ECTS)

EU	Goals	Modules	ECTS	Lecture s (hours)	TP (h.)	TL (h.)	Pers. work	Tota l
UE46	Revolutionary guideline of Vietnamese communist party (Mandatory)	M1: The birth of the Communist Party of Vietnam and the first political program of the Party M2: The way to fight the government of 1930-1945 M3: The Resistance colonialism and the Great American invasion M4: Industrialization	6	45		0	90	135

				-			
		M5: The way to a market economy oriented socialist M6: The way to build the political system					
UE47	Environmental Management (Mandatory)	M1: Basic issues of environmental management M2: The basis of environmental management M3: Tools in environmental management M4: State management system for environmental protection and environmental inspection M5: Environmental management of urban and industrial zones M6: Environmental management of rural and craft villages	6	45	0	90	135
UE48	Economics of Trade and Services (Mandatory)	M1: General introduction of trade and services M2: Distribution system of goods and services M3: E- commerce M4: Economic services M5: Business services and integration	6	45	0	90	135
UE49	Malicious code analysis (Mandatory)	 M1: Introduction to malware M2: Static analysis M3: Dynamic analysis M4: Malware analysis on portable devices 	4	30	0	60	90
UE50	Strategic Security Management (Mandatory)	M1: Introduction to Information Security Management System (ISMS) M2: Risk Assessment in Information Security M3: Setting up risk control measures M4: Setting ISMS	4	30	0	60	90
UE51	Information System Security Audit	M1: Overview of evaluate and verify information safety.	4	22.5	7.5	60	90

	(Mandatory)	M2: Information security					
		risk management					
		M3: ISO 27005 in					
		information security					
		assessment					
		M4: Operating system					
		verification					
		M5: Network verification					
		M6: Information security					
		testing tools					
	Mobile	M1: Overview of Mobile					
	Application	App Development					
LIE52	Development	M2: Developing the	6	30	1.5	90	135
0102	(Optional)	Android App	0	00	10	50	100
	(Opuona)	M3: Developing the iOS					
		Арр					
		M1: Introduction to					
		Network Security					
		M2: Threats to					
	Network and	communications networks					
LIF 53	operating system	M3: The role of encryption	6	30	15	90	135
01.00	security	in network security M4:	0	00	10	50	100
	(Optional)	Perform encryption in					
		network					
		M5: Authentication and					
		access control					

EU semester 7 (30 ECTS)

EU	Goals	Modules	ECTS	Lecture s (hours)	TP (h.)	TL (h.)	Pers. work	Tota l
UE54	Internship (Mandatory)	M1: Study overview of the problem and the company where interns are training. M2: Planning M3 : Requirements Discovery, Requirements analysis and Requirements Specification M4: Design Software/Find solutions to the Problem M5: Implementation M6: Software testing	24	0		180	360	540
UE55	Web Application	M1: Overview of web	6	30		15	90	135

	Security and	applications					
	Testing	M2: Common web					
	(Optional)	application testing methods					
		M3: Some tools support					
		web application testing					
		M4: Web application					
		security					
		M1: Network Security					
		Monitoring Rationale					
		M2: Collecting Network					
		Traffic: Access, Storage,					
		and Management					
		M 3: Stand-alone NSM					
		Deployment and					
		Installation					
		M4: Distributed					
		Deployment					
		M5: OS Platform					
		Housekeeping					
	Network security	M6: Command Line Packet	_				
UE56	monitoring	Analysis Tools	6	30	15	90	135
	(Optional)	M7: Graphical Packet					
		Analysis Tools					
		M8: NSM Consoles					
		M 9: NSM Operations					
		M 10: Server-side					
		Compromise					
		M11: Client-side					
		Compromise					
		M 12: Extending Security					
		Onion					
		M 13: Proxies and					
		Checksums					

EU semester 8 (20 ECTS)

EU	Goals	Modules	ECTS	Lecture s	TP	TL	Pers. work	Tota l
UE57	Graduation thesis (Mandatory)	M1: Study overview of the problem M2: Planning M3 : Requirements Discovery, Requirements analysis and Requirements Specification M4: Design Software/Find	20	0		150	300	450

	solutions to the Problem			
	M5: Implementation			
	M6: Software testing			

	GCI	GC2	GC3	GC4	GC5	GC6	GC7	GC8	GC9	GC10	GC11	SC13	SC14	SC15	SC16	SC17	SC18	SC19	SC20	SC21	SC22	SC23	SC24	SC25	SC26	SC27	SC28	SC29	SC 30	SC31	SC32
UE1			X			X				x																					
UE2				x	x	x																									
UE3			х								x		х	х																	
UE4			х	х	х	x			х																						
UE5				х	х	x			x																						
UE6						x	Х			х	х																				
UE7						x	X																								
UE8					x																										
UE9						x																									
UE10			х			x				х																					
UE11			х	х	x	x	X		x																						
UE12				х	х	х			х		х																				
UE13	X					х	X																								
UE14		x	х		х		X							х																х	
UE15		х			х	х							х																		
UE16		х		x	х																			x							
UE17		х				х		x																							
UE18						x	X																								
UE19					X																										

II.3. Mapping between competences and learning units:

	GCI		GC3	GC4	GC5	GC6	GC7	GC8	GC9	GCI	GC1	SC13	SC14	SC15	SC16	SC17	SC18	SC19	SC20	SC21	SC22	SC23	SC24	SC25	SC26	SC27	SC28	SC29	SC30	SC31	SC32
UE20						х																									
UE2 1			х	x		х	х																								Х
UE22	х					х						x	x		х			х				х	х	х	х		х	х	х	х	х
UE23		х			х	х	х						x	x																х	
UE24		х			х	х	х											х													
UE25		х	х	x	х	х				х				х		х															
UE26		х	х	x	х	х								х		х		х													
UE27		х	х	x	х	х								х	х	х															
UE28	Х					х	х																								
UE29		х	х		х	х																									
UE30					х		х																								
UE 31	Х		х			х					Х	x	x	x	х	х	x	х		x	х	х	х	х	х	х		х		х	X
UE32	Х	х	х		х	х	х	x				x	x	x	х	х	x	х	х		х	х			х					х	X
UE33			х		х	х								x			x							х							
UE34		х			х	х	х									х															
UE35	Х				х	х	х			х				x		х	x				х										
UE36		x			X	x								x					x												
UE37			x	x		X	X																								
UE 38						х	х																								

	GCI	GC2	GC3	GC4	GC5	GC6	GC7	GC8	GC9	GC10	GC11	SC13	SC14	SC15	SC16	SC17	SC18	SC19	SC20	SC21	SC22	SC23	SC24	SC25	SC26	SC27	SC28	SC29	SC30	SC31	SC32
UE39			x			x				x																					
UE40	X		x			x						X				x				х	x				x						
UE41						х	х	x	x													х									
UE42		x		x	x	х								х		х				x	х			х	х					х	
UE43		x			x	х								x																	
UE44	X				x	х													x												
UE45		х	x	x		x	х	x	х	x	X																				
UE46			x			x				x																					
UE47		х				x		x																							
UE48		х				x		x																							
UE49	Х	х	x	x	x	х		x				х	х	х		х			x	х	х	х	х								
UE50						х						х	х		х			х		х											
UE51	х										х		х	х																	
UE52			x		x	х	х	x								х		х												х	х
UE53	х				x	х	х					х	х	х	х		х	х	x	x											
UE54					x	х	х	x	x			х	х	х	х	х	х	х	x	x	х	x	х	х	х	x	х	х	х	х	х
UE55	х				x	х	х			х		х	х	х		х	х	х						х				х		х	
UE56					x	х						X							x	х											
UE57						х		x	x			х	x	х	х	х	х	х	x	x	х	x	X	х	х	x	х	х	х	х	X

II.4. The final dissertation

a) What will be asked from students for the dissertation (When? Number of pages? Relationship with the contents of formation.

The final dissertation is in the last (eighth) semester. There is no rule for number of pages. The dissertation's name and content have to be related to the content of the training program.

The students have to defend the thesis before a committee or jury formed by 3 members from the Faculty of Information Technology. Students must submit a written report to the jury, after approval by the advisor and the two reviewers. Publication of research papers in conferences or journals is optional, not a requirement.

b) Describe the role of the two types of tutors, the university tutor, the company tutor.

The university tutor is a responsibility of the academic advisor during the process of preparation of the thesis by the students. The company tutor is in charge of guideline reality issues which display in students' thesis based on the basic knowledge equipped at the university.

c) Describe the expected results of the final dissertation

An original, unpublished and significant contribution to the field of digital security and cyber security, in any of its possible domains of application (industry, manufacturing, administration, public services, societal services, baseline & fundamental technologies, applied products and services, etc.)

d) Describe the modalities of defense of final dissertation

Public defense to a jury or committee (45 minutes, including debate and questions with the committee members).

e) Indicate the timetable for the realization of the final dissertation

Two weeks before the online course registration of the University, the Faculty of Information Technology announces the list of qualified students.

- One week before the online course registration of the University, the Faculty of Information Technology publishes the list of names or directors of the thesis of the lecturers for reference. This list is unlimited, students can propose, discuss, and agree with their tutor to choose another topic.
- Registration period: Students who are eligible for the graduation thesis will register the module according to the general calendar of the University, contact their tutor to agree on the registration and implementation of the thesis.
- After registering for the course and before the graduation thesis: Students submit the registered topics with the tutor's certification for the Faculty. The Faculty and Department approve the list of theses, then submit the list to the President Board to make decisions.
- 7 days after the beginning of the graduation thesis time, students submit the syllabus with their advisor's certification to the Department.
- 4 weeks after the beginning of the graduation thesis time, the students submit the progress report with their advisor's certification for Faculty and Department.
- 10 weeks after the beginning of the graduation thesis time, students submit 02 thesis reports for the Department. Department assigns the lecturers who mark the instructor and reviewer one. The Department collects scores, report and soft report to submit to the Faculty a week later.

- After that, the Faculty publishes the list of eligible students to defend in front of the committee, sets up subcommittees to grade the graduation thesis. Each subcommittee has three qualified lecturers in accordance with regulations to submit to the President Board who makes the decision.
- Subcommittees grade each student, calculate the grade of the module according to the general regulations of the University, submit scores to the Faculty for submission to the Department of Training Management.

f) Indicate the number of ECTS granted to the final dissertation

20 ECTS.

II.5. Internship in company

a) Indicate the schedule of work placements

Internship at companies takes place at the 7^{h} semester. The duration of the intership is 12 weeks (refer c for the information more detail in of the selection procedure)

(b) Indicate the types of enterprises and types of jobs to be done

Students implement the internship at the companies that need the high level security as banking, army, telecommunication, computer service, manufacturing, etc...The students can participate to design, manage, analyse a network system,...

c) indicate the procedures for follow-up of work placements, the role of the referring professor, the role of the company tutor.

Students find the internship by themselves or they can apply the internship in the companies which have the collaboration with the university.

- The companies and the faculty of information technology (FITA) exchange the plan and then give the schedule, the contents of the internship.

- FITA announces internship placements to students

- The companies interview and select the students for the internship placements

- The results should be sent to FITA

- The staff of company (company tutor) is responsible to train the studenst during the internship.

- At the end of the internship, the companies review and evaluate the results and send a report to FITA.

- The lecturer of FITA (referring professor) is responsible to evaluate the results of students and to ensure quality and also the other requirements of Vietnam National University of Agriculture.

II.6. Internship in a company abroad

a) Indicate the schedule of internships abroad

(b) Indicate the types of enterprises and jobs corresponding to the content of the training

c) indicate the contents of the teaching contract binding the host company and the university (specifications or agreement model to be included in the annex)

d) indicate how the internship will be assessed abroad, the number of ECTS granted to this EU

II.7. Mobility to foreign companies (if any)

a) List universities abroad with a partnership with your university and the chairs (or department, or institute) concerned

b) Indicate the areas, diplomas for which a period of mobility is possible

III Modalities for the control of knowledge

For each EU, indicate the methods of checking knowledge

According to a general rule of VietNam Natational University of Agriculture, Each EU will has three scores:

- Attendance Score (0.1), Students must attend more than 75% of time in the class or the pratice room to be eligible for the final exam.
- Mid-term Score (0.3): Student has to do a project related the EU (individual or group) and must defend it, or written....
- Final Score (0.6): Form of examination (written, oral, practical), duration of the control: 60 75 minutes.
- Score: on a scale from 0 to 10

b) Indicate the rules of obtaining a EU (UE)

- Rules for the allocation of EU: EU score is an average of the attendance score, the mid-term score and the final score.
- Compensation rule between units (if applicable)
- Period of validity of a EU obtained (UE): EU score is greater than or equal to 4.0
- Eliminary scores: EU score is smaller than 4.0

IV Composition of pedagogical team

a) The general pedagogical responsible of the new curriculum

Name : TRÀN First name : Đức Quỳnh Function : Dean-FITA University : VNUA

EU	Responsible of EU	University of attachment
		Vietnam National University
UE1	Lecturer from Faculty of Social science	of Agriculture
		Vietnam National University
UE2	Ngo Cong Thang	of Agriculture
		Vietnam National University
UE3	Nguyen Tien Hien	of Agriculture
		Vietnam National University
UE4	Nguyen Xuan Thao	of Agriculture
		Vietnam National University
UE5	Nguyen Xuan Thao	of Agriculture
		Vietnam National University
UE6	Lecturer from the Faculty of Social science	of Agriculture
	Lecturer from the Faculty of Education and	Vietnam National University
UE7	Foreign Languages	of Agriculture

b) Pedagogical responsibles by EU Educational units (Teachers by EU)

LIDO	Lecturer from the Faculty of Physical	Vietnam National University
UE8	Education	of Agriculture
	Lecturer from the Faculty of National Defense	Vietnam National University
UE9	and Security Education	of Agriculture
	Lesterner from the Easther of Control action	Vietnam National University
UEIU	Lecturer from the Faculty of Social science	of Agriculture
	Newwoon Thill on	Vietnam National University
UEII		Viotnem National University
UF12	Nauven Thi Thuy Hanh	of A griculture
0112		Vietnam National University
UE13	Pham Quang Dung	of Agriculture
		Vietnam National University
UE 14	Hoang Thi Ha	of Agriculture
		Vietnam National University
UE15	Ngo Cong Thang	of Agriculture
		Vietnam National University
UE16	Hoang Thi Thanh Giang	of Agriculture
	Lecturer from Faculty of Accounting and	Vietnam National University
UE17	Business Managment	of Agriculture
	Lecturer from the Faculty of Education and	Vietnam National University
UE18	Foreign Languages	of Agriculture
	Lectuer from the Faculty of Physical	Vietnam National University
UE19	Education	of Agriculture
		Vietnam National University
UE20	Lectuer from Centre for Soft Skills Training	of Agriculture
	Lecturer from the Faculty of National Defense	Vietnam National University
UE21	and Security Education	of Agriculture
	Lecturer from the Faculty of Education and	Vietnam National University
UE22	Foreign Languages	of Agriculture
11500		Vietnam National University
UE23	Pham Viet Nga	of Agriculture
	No. Come Thomas	Vietnam National University
UE24	Ngo Cong Thang	Vietnem National University
UE25	Ngo Cong Thang	of A grigulture
0123		Vietnam National University
UE26	Ngo Cong Thang	of Δ griculture
0120		Vietnam National University
UE27	Tran Trung Hieu	of Agriculture
		Vietnam National University
UE28	Tran Thi Thu Huven	of Agriculture
	Lecturer from the Faculty of National Defense	Vietnam National University
UE29	and Security Education	of Agriculture
	Lecturer from the Faculty of Education and	Vietnam National University
UE30	Foreign Languages	of Agriculture
		Vietnam National University
UE31	Pham quang Dung	of Agriculture
		Vietnam National University
UE32	Pham Quang Dung	of Agriculture
		Vietnam National University
UE33	Phan Trong Tien	of Agriculture

		17' A AT A AT A A A A A A A A A A A A A A
		Vietnam National University
UE34	Iran Duc Quynn	of Agriculture
11525		Vietnam National University
UE35	Nguyen Van Hoang	of Agriculture
		Vietnam National University
UE36	Iran Irung Hieu	of Agriculture
115.05		Vietnam National University
UE37	Pham Quang Dung	of Agriculture
	Lecturer from the Faculty of Education and	Vietnam National University
UE38	Foreign Languages	of Agriculture
		Vietnam National University
UE39	Lecturer from the Faculty of Social science	of Agriculture
		Vietnam National University
UE40	Lecturer from the Faculty of Mecanics	of Agriculture
		Vietnam National University
UE41	Nguyen Van Hoang	of Agriculture
		Vietnam National University
UE42	Tran Duc Quynh	of Agriculture
		Vietnam National University
UE43	Phan Trong Tien	of Agriculture
	× · · · · · · · · · · · · · · · · · · ·	Vietnam National University
UE44	Nguyen Van Hoang	of Agriculture
		Vietnam National University
UE45	Pham Ouang Dung	of Agriculture
		Vietnam National University
UE46	Lecturer from the Faculty of Social science	of Agriculture
		Vietnam National University
UE47	Lecturer from the Faculty of Environment	of Agriculture
	Lecturer from the Faculty of Accounting and	Vietnam National University
UE48	Business Managment	of Agriculture
02.0		Vietnam National University
UE49	Ngo Cong Thang	of Agriculture
		Vietnam National University
UE50	Tran Duc Ouvnh	of A griculture
0150		Vietnam National University
UF51	Nguyen Hoang Huy	of A griculture
0L31		Vietnam National University
LIE52	Tron Trung Higu	of A griculture
01132		Vietnem National University
LIE52	Phom Quana Duna	of A griculture
UESS		Vietnem National University
	Ecoulty (EITA) and Company	of A grigulture
UEJ4	racuny (FITA) and Company	Of Agriculture
LID 55		vietnam inational University
UESS	Hoang Ini Ha	of Agriculture
		Vietnam National University
UE56	Nguyen Thi Thuy	of Agriculture
		Vietnam National University
UE57	Faculty (FITA) and Company	of Agriculture

c) Teachers involved in the curriculum (=renovateurs)

Name	University	Disciplines taught	Number of hours of intervention(est)	Concerned EU
Tran Duc Quynh	VNUA	Algorithms, Security,	120	UE33, UE42,UE51
		Management		
Pham Quang		Network, Secutiy	180	UE 13, UE30,
Dung				UE31, UE 36,
				UE45, UE54
Nguyen Van	VNUA	Encryption and	90	UE34, UE41,
Hoang		data security		UE44
Nguyen Thi	VNUA	Security	30	UE56
Thuy				
Phan Trong Tien	VNUA	Operating system	70	UE43, UE32
Pham Viet Nga	VNUA	Database	45	UE22
		Security		

d) Professionals involved in the curriculum

(=professionals animating a training course/a lecture on a professional theme)

Name	Company	Disciplines taught	Number of hours of intervention(est)	Concerned EU
Nguyen Trong phuc and Staffs of IFI	IFI Solution	Software Development	330	Internship, Thesis
Nguyen Huu Tuan and Staffs of Network Center	Network Center of VNUA	Network and Security	430	Internship, Thesis
Ta Minh Thuy	Banking	Security	430	Internship, Thesis
Phan Trong Tien	BacHa Hospital	Security	150	UE43,UEE32
Nguyen Hoang Huy and Staffs of MVC	MVC	Information System	90	UE52
Pham Quang Dung and Staff of VNUA-IT Center	VNUA-IT Center	Network, Security	250	UE 13, UE30, UE31, UE45, UE54
Tran Van Hoang and Staffs of VietED	VietED	Ìnformation System	330	Internship, Thesis
Nguyen Tuan Dung and Staffs of Viking	Viking	Management	330	Internship, Thesis

NB: the number of hours of intervention of professionals must be 30% of the total hours.

V Professional Insertion

a) Indicate the methods used to support the professional integration of young graduates

Whether the students are looking for a job or an internship, there are a number of search strategies available to obtain their dream position.

- The Faculty of Information Technology has professional internship agreements with many companies. Additionally, most companies offer internship positions for our students. The internship programs are designed by the companies to supply students with required technical training. The students will be evaluated after the interview to identify potential candidates suitable for becoming interns or employees. However, the faculty also proposes different external internship subjects of the study programs. Each study program is assigned coordinator(s) who advise students on practical issues. The students can find information about the coordinators on the study program's website and do the optional external internships in the companies.
- The Faculty usually organizes many conferences and meetings with the companies. This is one of the regular activities to create a good relationship with the companies to orient careers for students after graduated.
- Every year, the University holds Annual Job Fair Day with the participation of hundreds of companies and thousands of job positions in many varieties of areas including information technology. This is the annual activity of the University to create conditions for graduates to find stable and suitable jobs and they have many opportunities to train job skills, career orientation, access to the labour market and employers.
- As a rule, a student can find a job or an internship by himself/herself; if necessary, with the help of internship coordinator/administrative training assistant. All job and internship listings are posted on the study program's website. The students can follow the information to apply a job or an external internship.

(b) Indicate the composition and role of the employment office of the university

The Employment Counselling and Student Support Centre (http://tvvl.vnua.edu.vn/) and Human Resource Supply Centre (http://vieclamnongnghiep.vn/) at the University are the places where transfer the student more useful information for career orientation, internship opportunities, recruiting plan as well as job positions in Vietnam and other countries. The objectives are to provide students with a centralized information system of employment opportunities around campus, standardized procedures for student employments and career building skills.

These employment offices are open Monday through Friday 8 AM - 5 PM and closed during chapel and all regular university holidays.

Students who are interested in applying for employment positions can visit these offices located in the University. Employment opportunities can be found online at the website:

http://tvvl.vnua.edu.vn/ and http://vieclamnongnghiep.vn/

VI. Subjects

UE1: Principle of Marxism and Leninism 1

	Subject: Principle of Marxism and Leninism 1
Course	
ECTS	4

Character	Mandatory		
Semester	1		
Languages in which it is taught	Vietnamese		
Basic and general	GC3. Critical thinking		
competences	GC6. Ability for self-study		
	GC10. Representation skill:	Ability to represent, illustrate,	
	convince		
Specific competences			
Transversal competences			
Learning outcomes	The ability to analyze systems,	, mechanisms and procedures	
	related to protection of information	ation entities and objects	
Contents	M1: Introduction to basic print	ciples of Marxism and Leninism	
	M2: Dialectical materialism		
	M3: Materialist dialectics		
	M4. Historical materialism		
Observations	T , •		
include list)	Lecturing		
(include list)	Formation activities		
Denomination of the	Hours	Presence (%)	
formative activity			
Plenary session and	30	33.3%	
problem / exercise solving			
Lab practices	0	0	
	Sistemas de evaluación		
Denomination of the	Minimum weighting (%)	Maximum weighting (%)	
evaluation system			
Development and	10	100	
objective tests, problem			
solving and / or exercises			
(with possibility of final			
Practical tests (with	10	100	
possibility of final exam)		100	
Evaluation of work and	10	100	
activities			

UE2: Basics of informatics

	Subject: Basics of informatics
Course	
ECTS	6
Character	Mandatory
Semester	1
Languages in which it	Vietnamese

is taught			
Basic and general	GCA: Creativity and Reactivity		
competences	GC5: Ability to apply theoretical	knowledge to practice	
competences	CC6. Ability for celf study	knowledge to practice	
	GCo: Admity for sen-study		
Specific competences			
Transversal			
competences			
Learning outcomes	Explain the basic concepts, social	and legal issues in the field of	
	information technology;		
	Explain how to represent some ty	pes of basic data on computers,	
	computer architecture and compu	ter networks, roles and principles	
	of the operating system, basic pri	nciples of communication and	
	information security in computer	and computer networks:	
	Explain the principles and technic	ues of programming, how a	
	program is executed on the comp	uter:	
	Ability to use computers Internet	and office applications for basic	
	work		
Contents	M1: Information and information	representation	
Contents	M2: Computer organization	representation	
	M2: Computer software and oper	ating system	
	M3: Computer software and operating system		
	M5: The social issues of informat	internet	
	MG. MS Word & MS DowerDoin	hon technology	
	MO: MS WORD & MS POWERPOIN	L	
	M9. Algorithms		
	M8: Algorithms		
	M9: Programming		
Observations			
Teaching	Lecture, Demonstration, Problem solving, Show and tell, Work		
methodologies (include	assignment, Practice.		
list)			
	Formation activities		
Denomination of the	Hours	Presence (%)	
formative activity			
Plenary session and	30	22.2%	
problem / exercise			
solving			
Lab practices	15	11.1%	
Sistemas de evaluación			
Denomination of the	Minimum weighting (%)	Maximum weighting (%)	
evaluation system			
Development and	10	100	
objective tests,			
problem solving and /			
or exercises (with			
possibility of final			
exam)			
Practical tests (with	10	100	
possibility of final			
exam)			
Evaluation of work	10	100	
and activities		100	

UE3: Physics for Informatics

	Subject: Physics for Informatics
Course	
ECTS	6
Character	Mandatory

Semester	1		
Languages in which it is taught	Vietnamese		
Basic and general competences	GC3: Critical thinking GC11: Skill in conducting trend analysis		
Specific competences	SC14: To understand and to apply the up-to-date methods, tools, software and techniques to analyze risks, threats and protect the system. SC15: The ability to understand security demands and design and implement software/hardware security solutions		
Transversal competences			
Learning outcomes	Finishing the course, learners will acquires knowledge on mechanical motion, phenomenon and laws involving the electrical and magnetic movements. These knowledges are the supports for the learners to follow specific competance courses. This course also help learners to develop their self-studying skill and partial team work skill		
Contents Observations Teaching methodologies (include list)	M1: Units and Measurements M2: Mechanics M3: Electrical Field M4: Electrical Currents and Electrical Sources M5: Electrical Materials M6: Introduction to Electronic Circuits M7: Magnetic field, Magnetic induction M8: Electromagnetic Field and Waves M9: Optical information M10: Introduction to Sensors and Applications M11: Introduction to an Electronic Circuits Design Software with Proteus software - Lecturing - Demonstration		
list)	- Discussion - Problems-solving instructing		
	- Question responding		
Donomination of the	Formation activities	Prosonce (%)	
formative activity	nours	r resence (76)	
Plenary session and	30	22.2%	
problem / exercise solving			
Lab practices	15	11.1%	
	Sistemas de evaluación		
Denomination of the	Minimum weighting (%)	Maximum weighting (%)	
evaluation system	10	100	
Development and	10	100	
nrohlem solving and /			
or exercises (with			
possibility of fi exam)	inal		
--	--------------	----	-----
Practical tests (w possibility of fi exam)	with inal	10	100
Evaluation of we and activities	ork	10	100

UE4: Linear Algebra

	Subject: Linear Algebra
Course	
ECTS	6
Character	Mandatory

Semester	1		
Languages in which it	Vietnamese		
is taught			
Basic and general	GC3. Critical thinking		
competences	GC4. Creativity and Reactivity		
	GC5. Ability to apply theoretical knowledge to practice		
	GC6. Ability for self-study		
<i>a</i> 1 1 1	GC9. Time management skill		
Specific competences			
Transversal			
competences			
Learning outcomes	-Apply the basic knowledge of ma	thematics and natural sciences to	
	solving theoretical and practical i	ssues related to information	
	security, thereby developing new	knowledge and continuing	
	studying at higher levels.		
	- Present basic knowledge on man	agement, economics,	
	environmental protection.		
	Ĩ		
	-Self-orientated, adapt to different	working environments; Being	
	aware of the necessity of self-lear	ning, accumulation of knowledge	
	and experience to improve the pro-	ofessional level to meet the job	
	requirements.		
Contents	M1: Matrix Algebra and Determinants		
	M2: Systems of linear equations		
	M3: Vector spaces		
	M4: Diagonalization		
Observations			
Tooching	Lasturing		
methodologies (include	Lecturing		
list)			
	Formation activities		
Denomination of the	Hours	Presence (%)	
formative activity			
Plenary session and	30	22.2%	
problem / exercise			
solving			
Lab practices	15	11.1%	
	Sistemas de evaluación		
Denomination of the	Minimum weighting (%)	Maximum weighting (%)	
evaluation system			
Development and	10	100	
objective tests,			
problem solving and /			
or exercises (with			
possibility of final			
exam)			
Practical tests (with	10	100	
possibility of final			
exam)			
Evaluation of work	10	100	

and activities	
und dett mes	

UE5: Calculus

	Subject: Calculus
Course	
ECTS	6 ECTS
Character	Mandatory
Semester	1

Languages in which it is taught	Vietnamese	
Basic and general	GC4: Creativity and Reactivi	tv
competences	GC5: Ability to apply theore	tical knowledge to practice
·····F ······	GC6: Ability for self-study	
	GC9: Time management skil	1
		-
Specific competences		
Transversal competences		
Learning outcomes	This module provides learners with knowledge about functions	
	of one variable, integration of functions of one variable,	
	sequences and series of fur	nctions, multivariable functions,
	multiple intergral and differer	ntial equations.
Contents	M1: Funtions of one variable	
	M2: Integration of functions of	of one variable
	M3: Sequenses and series of f	funtios
	M4: Multivariable functions	
	M5: Multiple integral	
	M6: Differential equations	
Observations		
Teaching methodologies (include list)	Teaching theory	
	Formation activities	
Denomination of the	Hours	Presence (%)
formative activity		
Plenary session and	45	33.3%
problem / exercise solving		
Lab practices	0	0
	Sistemas de evaluación	
Denomination of the	Minimum weighting (%)	Maximum weighting (%)
evaluation system		
Development and	10	100
objective tests, problem		
solving and / or exercises		
(with possibility of final		
exam)		
Practical tests (with	10	100
possibility of final exam)		
Evaluation of work and	10	100
activities		

UE6: Introduction to laws

	Subject: Introduction to laws	
Course		
ECTS	4 ECTS	
Character	Mandatory	
Semester	1	

Languages in which it is taught	Vietnamese		
Basic and general	GC6. Ability for self-study		
competences	GC7 Ability to work in a diversity group and in an		
competences	international context (teamwork)		
	GC10 Representation skill:	Ability to represent illustrate	
	convince		
	COIVINCE CC11 Skill in conducting trand analysis		
Specific competences	Gerri. Skin in conducting the		
Transversal competences			
Learning outcomes	This module provides learners	s with apply knowledge of social	
Learning outcomes	science and humanities to care	er and life	
Contents	M1: Fundamental theoretical is	ssues about the State and Law	
Contents	M9: Fundamental issues about	the State and Law of the Socialist	
	Republic of Vietnam	are successful har of the bootalist	
	M3: Basic contents of the Civil	Law and the Criminal Law	
	M4: Basic contents of the Economic Law Labor Law Mar		
	and Family Law		
M5: Basic contents of the Administrative Law and the Ant		inistrative I aw and the Anti-	
	corruption Law		
Observations			
Teaching methodologies	Teaching theory		
(include list)			
	Formation activities		
Denomination of the	Hours	Presence (%)	
formative activity			
Plenary session and	30	33.3%	
problem / exercise solving			
Lab practices	0	0	
	Sistemas de evaluación	1	
Denomination of the	Minimum weighting (%)	Maximum weighting (%)	
evaluation system			
Development and	10	100	
objective tests, problem			
solving and / or exercises			
(with possibility of final			
exam)			
Practical tests (with	10	100	
possibility of final exam)			
Evaluation of work and	10	100	
activities			

UE7: An Introduction to Cefr - Based Tests

	Subject: An Introduction to Cefr - Based Tests
Course	
ECTS	2ECTS
Character	Mandatory

Semester	1		
Languages in which it	Vietnamese		
is taught			
Basic and general	GC6. Ability for self-study		
competences	GC7. Ability to work in a diver	sity group and in an international	
-	context (teamwork)		
Specific competences			
Transversal			
competences			
Learning outcomes	Students con shility to write	simula mananta mananta miniana	
	Students can ability to write	simple reports, present opinions	
	related to professional work.		
Contents	M1. Section A - Grammar and R	eading	
	M2. Section B - Listening		
Observations			
Teaching	Lecturing		
methodologies (include	Lootaning		
list)			
	Formation activities		
Denomination of the	Hours	Presence (%)	
formative activity			
Plenary session and	30	33.3%	
problem / exercise			
solving			
Lab practices	0	0	
	Sistemas de evaluación		
Denomination of the	Minimum weighting (%)	Maximum weighting (%)	
evaluation system			
Development and	10	100	
objective tests,			
problem solving and /			
or exercises (with			
possibility of final			
exam)			
Practical tests (with	10	100	
possibility of final			
exam)			
Evaluation of work	10	100	
and activities			

UE10: Principle of Marxism and Leninism 2

	Subject: Principle of Marxism and Leninism 2
Course	
ECTS	6ECTS

Character	Mandatory		
Semester	2		
Languages in which it is taught	Vietnamese		
Basic and general competences	GC3. Critical thinking GC6. Ability for self-study GC10. Representation skill: Ability to represent, illustrate, convince		
Specific competences			
Transversal competences			
Learning outcomes	Students can apply knowledge of social science and humanities to career and life.		
Contents	M1: Theory of value		
	M2: Theory of surplus value		
	M3: Theory of capitalism and State monopoly capitalism		
	M4. The Instantial mission of the working class and the socialist revolution M5: The social and political issues in the process of socialist revolution M6: Socialism - reality and prospects		
Observations		1	
Teaching methodologies (include list)	Lecturing		
	Formation activities		
Denomination of the formative activity	Hours	Presence (%)	
Plenary session and problem / exercise solving	45	33.3%	
Lab practices	0	0	
Sistemas de evaluación			
Denomination of the evaluation system	Minimum weighting (%)	Maximum weighting (%)	
Development and objective	10	100	
tests, problem solving and / or exercises			
Practical tests	10	100	
Evaluation of work and activities	10	100	

UE11: Probability and Statistics

	Subject: Probability and Statistics
Course	
ECTS	6 ECTS
Character	Mandatory

Semester	2		
Languages in which it	Vietnamese		
is taught			
Basic and general	GC3: Critical thinking		
competences	GC4: Creativity and Reactivity		
competences	GC5: Ability to apply theoretical	knowledge to practice	
	GC6: Ability for self-study	knowledge to practice	
	GC7: Ability to work in a divers	vity group and in an international	
	context (teamwork)	sity group and in an international	
	GC9: Time management skill		
Specific competences			
Transversal			
competences			
I earning outcomes	After successfully completing thi	s course you should be able to:	
Learning outcomes	- Apply the concept of proba	bility and probability rules to	
	practical problems	tomity and probability fulles to	
	Identify the characteristic numb	ars of random variables	
	- Summarize the basic knowledge	ers of campling theory descriptive	
	statistics	es of sampling theory, descriptive	
	Apply the problems of estimat	ion statistical hypothesis testing	
	- Apply the problems of estimat	ion, statistical hypothesis testing,	
Contonts	M1: Descriptive statistics		
Contents	M9. Drobability		
	M2: Pondom variables		
	Mo: Kandom variables		
	M4: Parameter estimation		
	M5: Hypothesis testing		
Observations	Mo: Simple linear regression		
The abies of			
Teaching	- Lecturing method;		
methodologies (include	6		
list)	- Teaching with multi-media.		
	Formation activities		
Denomination of the	Hours	Presence (%)	
formative activity			
Plenary session and	45	33.3%	
problem / exercise			
solving			
Lab practices	0	0	
	Sistemas de evaluación		
Denomination of the	Minimum weighting (%)	Maximum weighting (%)	
evaluation system			
Development and	10	100	
objective tests,			
problem solving and /			
or exercises (with			
possibility of final			
exam)			
Practical tests (with	10	100	
possibility of final			
exam)			
Evaluation of work	10	100	
and activities			

UE12: Discrete mathematics

	Subject: Discrete mathematics	
Course		
ECTS	6	
Character	Mandatory	

Semester	2		
Languages in which it is taught	Vietn	amese	
Basic and general	GC4 : Creativity and Reactivity		
competences	GC5 : Ability to apply theoretical	knowledge to practice	
	GC6 : Ability for self-study		
	GC9 : Time management skill		
	GC11 : Skill in conducting trend	analysis	
Specific competences			
Transversal			
competences	~		
Learning outcomes	Students have the skills of ma	thematical thinking and apply	
	the theoretical knowledge the	y have learned in a number of	
	practical	problems	
Contents	M1: Counting problem		
	M2: Basic concepts of graphs		
	M3: Eulerian Graphs, Hamiltoni	an Graphs, Bisection Graphs, flat	
	Graphs		
	M4: Trees and some applications of trees		
	M5: Some optimization problems on the graph		
	M6: Introduction to Mathematical Logic		
Observations			
Teaching			
methodologies (include	reaching theory		
Donomination of the	FOFIliation activities Hours		
formative activity	Hours	Tresence (78)	
Plenary session and	45	33 30/2	
nroblem / exercise		55.570	
solving			
Lab practices	0	0	
k	Sistemas de evaluación		
Denomination of the	Minimum weighting (%)	Maximum weighting (%)	
evaluation system			
Development and	10	100	
objective tests,			
problem solving and /			
or exercises			
Practical tests (with	10	100	
possibility of final			
exam)			
Evaluation of work	10	100	
and activities			

UE13 : Computer architectures and micro – procesing

	Subject: procesing	Computer	architectures	and	micro	-
Course						

ECTS	6		
Character	Mandatory		
Semester	2		
Languages in which it is taught	Vietnamese		
Basic and general competences	GC1: The ability to analyze systems, mechanisms and procedures related to protection of information entities and objects GC6: Ability for self-study GC7: Ability to work in a diversity group and in an international context (teamwork)		
Specific competences			
Transversal competences			
Learning outcomes	The module aims to help students gain skills in analyzing the behavior of computer system components, assessing the effectiveness of management methods, memory access and data exchange		
Contents	M1: General introduction		
	M2: Computer system		
	M3: Data representation and computer arithmetic		
	M4: Central Processor Unit		
	M5: Memory System		
	M6: Input-output system		
	M7: The basic structure of	f the 8088	
	M8: 8088 with memory		
	M9: 8088 with Input-output system		
Observations			
Teaching methodologies (include	- Teaching theory		
list)	- Doing homework		
	- Discussion groups		
F	ormation activities		
Denomination of the formative activity	Hours	Presence (%)	
Plenary session and problem /	45	33.3%	
exercise solving			
Lab practices	0	0%	
Sis	temas de evaluación		
Denomination of the evaluation	Minimum weighting	Maximum weighting (%)	
system	(%)		
Development and objective tests,	10	100	
problem solving and / or exercises			
Practical tests	10	100	
Evaluation of work and activities	10	100	

UE14 : Database

	Subject: Database
Course	
ECTS	6

Character	Mandatory		
Semester			
Languages in which it	Vietnamese		
is taught			
Basic and general	GC2. Problem solving ability. design ability		
competences	GC3. Critical thinking		
-	GC5. Ability to apply theoretical	knowledge to practice	
	GC7. Ability to work in a divers	ity group and in an international	
	context (teamwork)		
Specific competences	SC15. The ability to understand	security demands and design and	
	implement software/hardware sec	urity solutions	
	SC31. The ability to know, understand and apply database security		
	techniques.		
Transversal competences			
Learning outcomes	At the end of this class, the succe	ssful student will:	
_	- Have a broad understanding of	database concepts and database	
	management system software		
	- Have a high-level understandi	ng of major DBMS components	
	and their function		
	- Be able to model an applic	ation's data requirements using	
	conceptual modeling tools like E	R diagrams and design database	
	schemas based on the conceptual	model.	
	- Understand Data Normalization	1 . 1/1 . 1/. 1.	
	You understand functional dependencies and their relationship to		
	Novu understand BCNF and 3NF		
	You can find keys given a set of functional dependencies		
	You can identify tables that are not normalized		
	You can decompose unnormalized tables into BCNF and/or 3NF		
	compliant tables.		
	- Be able to write SOL comman	nds to create tables and indexes.	
	insert/update/delete data, and query data in a relational DBMS.		
Contents	M1: Overview of database		
	M2: E/R Diagrams		
	M3 : The Relational Data Model		
	M4: Design Theory for relational	databases	
	M5: SQL		
	M6: Query Optimization Basics		
	M7: Data integrity and security		
Observations Transhime			
reaching	Combine teaching theory with practice		
list)			
	Formation activities		
Denomination of the	Hours	Presence (%)	
formative activity			
Plenary session and	45	33.3%	
problem / exercise			
solving			
Lab practices	0	0	

Sistemas de evaluación		
Denomination of the	Minimum weighting (%)	Maximum weighting (%)
evaluation system		
Development and	10	100
objective tests,		
problem solving and /		
or exercises (with		
possibility of final		
exam)		
Practical tests (with	10	100
possibility of final		
exam)		
Evaluation of work	10	100
and activities		

UE15 : Programming Techniques

	Subject: Programming Techniques
Course	
ECTS	6
Character	Mandatory

Semester	2		
Languages in which it is	Vietnamese		
taught			
Basic and general	GC2: Problem solving ability design ability		
competences	GC5: Ability to apply theoretical knowledge to practice		
competences	GC6: Ability for self-study	ieur kilowieuge to praetiee	
Specific competences	SC14: To understand and to apply the up to date methods		
Specific competences	tools software and technique	b apply the up-to-date methods,	
	tools, software and techniqu	les to analyze fisks, tilleats and	
	protect the system		
I ransversal competences	17 1 1		
Learning outcomes	Knowledge:		
	The candidate will get knowle	edge of:	
	- Overview of programming t	echniques	
	- The C programming languag	ge	
	Skills:		
	- Programming with the C lan	guage	
Contents	M1: Overview of programming	ng techniques	
	M2: Introduction to the C pro	gramming language	
	M3: Input/Output statements	and control structures	
	M4: Structured data types		
	M5: Function		
	M6: Pointer data type		
	M7: File data type		
Observations			
Teaching methodologies	Theory teaching practice teaching		
(include list)			
	Formation activities		
Denomination of the	Hours	Presence (%)	
formative activity			
Plenary session and	30	22,2%	
nrohlem / evercise solving	50	22.270	
Lab practices	15	11 1%	
	Sistemas de evaluación	11.1 /0	
Donomination of the	Minimum weighting (%)	Movimum weighting $(9/)$	
Denomination of the	Winning (78)	Maximum weighting (76)	
Development and	10	100	
Development and	10	100	
objective tests, problem			
solving and / or exercises			
(with possibility of final			
exam)	10	100	
Practical tests (with	10 100		
possibility of final exam)			
Evaluation of work and	10	100	
activities			

	Subject: Numerical methods	
Course		
ECTS	4	
Character	Optional	
Semester	2	
Languages in which it is taught	Vietnamese	
Basic and general	GC2: Problem solving ability, de	sign ability
competences	GC4: Creativity and Reactivity	
-	GC5: Ability to apply theoretical	knowledge to practice
Specific competences	SC25: Ability to evaluate risks (r	isk assessment)
Transversal		
competences		
Learning outcomes	Students can apply some basic	e numerical methods to simple
	exercises in solving one-variab	ble equation, solving system of
	linear equations, finding app	roximate function, calculating
	derivative and integral, solving	g normal differential equations,
Contonts	M1: Approximation and errors	
Contents	M2: The approximate real value of	of a hidden equation
	M3: Approximate linear system of	of linear algebra
	M4: Interpolating polynomial and	l least squares method
	M5: Approximate derivative and	integral
	M6: The approximation of the no	rmal differential
Observations		
Teaching methodologies	Presenting on theory	
(include list)	Guiding classroom discussions	
	Formation activities	
Denomination of the	Hours	Presence (%)
formative activity		
Plenary session and	30	33.3%
problem / exercise		
L ab practicos	0	0
	Evaluation systems	U
Denomination of the	Minimum weighting (%)	Maximum weighting (%)
evaluation system		
,		
Development and	10	100
objective tests, problem		
solving and / or		
exercises (with		
possibility of final		
exam)		100
Practical tests (with	10	100
possibility of final		
Evaluation of work and	10	100
activities	10	100
	49	

	Subject: Principles of Account	ing
Course		
ECTS	6ECTS	
Character	Optional	
Semester	2	
Languages in which it	Vietnamese	
Is taught Design and general	CC2 Droblem colving ability	design ability
competences	GC6 Ability for self study	, design admity
competences	GC8 Ability to project organ	ization and planning
Specific competences	See. Tomy to project organ	
Transversal		
competences		
Learning outcomes	Present basic knowledge	on management, economics,
_	environmental protection	
Contents	M1: Nature and object of book keeping operation	
	M2: Financial report	
	M3: Evaluation and Inventory	
	M4: Accounting Methods and do	uble entry
	M5. Valuation	5
Observations		
Teaching	Presenting on theory	
methodologies (include		
list)		
Formation activities		
Denomination of the	Hours	Presence (%)
formative activity		22.22
Plenary session and	45	33.3%
problem / exercise		
SUIVINg Lab practices	0	0
	Evaluation systems	V
Denomination of the	Minimum weighting (%) Maximum weighting (%)	
evaluation system	winning (70)	Waxinum weighting (70)
Development and	10	100
objective tests.		
problem solving and /		
or exercises (with		
possibility of final		
exam)		
Practical tests (with	10	100
possibility of final		
exam)		
Evaluation of work	10	100
and activities		

UE18: English 0

	Subject: English 0	
Course		
ECTS	4ECTS	
Character	Mandatory	
Semester	2	
Languages in which it is taught	Vietnamese	
Basic and general	GC6. Ability for self-study	
competences	GC7. Ability to work in international context (teamy	a diversity group and in an vork)
Specific competences		
Transversal competences		
Learning outcomes	Students can use basic English grammar and the vocabulary needed to communicate simple topics like familiarity with oneself, family, daily activities, work shopping. In addition, students can hear simple conversations about the topics they have learned; read simple introductory essays, short and simple short stories on short topic topics on social networking sites	
Contents	M1: Let's begin M2: All about me M3: Tell me about your day M4: Let's go shopping M5: My family	
Tasshing mathedologies	Lesturing	
(include list)		
	Formation activities	
Denomination of the	Hours Presence (%)	
formative activity		
Plenary session and problem / exercise solving	30	33.3%
Lab practices	0	0
Sistemas de evaluación		
Denomination of the evaluation system	Minimum weighting (%)	Maximum weighting (%)
Development and objective tests, problem solving and / or exercises (with possibility of final exam)	10	100
Practical tests (with possibility of final exam)	10	100

Evaluation	of	work	and	10	100
activities					

UE22: English 1

	Subject: English 1		
Course			
ECTS	6ECTS		
Character	Mandatory		
Semester	3		
Languages in which it is taught	Vietnamese		
Basic and general competences	GC6. Ability for self-study GC7. Ability to work in international context (teamw	a diversity group and in an ork)	
Specific competences		· · · · · · · · · · · · · · · · · · ·	
Transversal competences			
Learning outcomes	Students learn basic English grammar and the vocabulary needed to communicate simple topics such as work, vacation, city, wildlife, and sports. In addition, students can hear simple conversations about the topics they have learned; Readers understand simple articles that serve the purpose of capturing information		
Contents	M1: It's great job! M2: Great vacation M3: Cities around the world M4: Wildlife M5: All about sports		
Teaching methodologies	Lecturing		
	Formation activities		
Denomination of the			
formative activity	liours	Tresence (70)	
Plenary session and problem / exercise solving	45	33.3%	
Lab practices	0	0	
	Sistemas de evaluación		
Denomination of the evaluation system	Minimum weighting (%)	Maximum weighting (%)	
Development and objective tests, problem solving and / or exercises (with possibility of final exam)	10	100	
Practical tests (with possibility of final exam)	10	100	
Evaluation of work and activities	10	100	

UE23: Database Security

	Subject: Database Security		
Course			
ECTS	4		
Character	Mandatory		
Semester	3		
Languages in which it is taught	Vietnamese		
Basic and general competences	GC2: Problem solving at	oility, design ability	
	GC5: Ability to apply the	eoretical knowledge to practice	
	GC6: Ability for self-study		
	GC7: Ability to work in	a diversity group and in an	
	international context (teamwork)		
Specific competences	SC14: To understand and	I to apply the up-to-date methods,	
	tools, software and techn	iques to analyze risks, threats and	
	protect the system		
	SC15: The ability to u	nderstand security demands and	
	design and implement	nt software/hardware security	
	solutions	-	
	SC31: The ability to kno	w, understand and apply database	
	security techniques		
Transversal competences			
Learning outcomes	Knowledge:		
	The candidate will get kr	nowledge of:	
	- Overview of database security		
	- Database attacks		
	- Prevention techniques		
	Skills:		
	- Designing and protectir	ng database systems	
Contents	M1: Overview of databas	se security	
	M2: Access control		
	M3: Inference control		
	M4: Flow control and da	ta encryption	
	M5: Advanced topics		
Observations			
Teaching methodologies	Theory teaching, pra	actice teaching, and project	
(include list)	implementing		
	Formation activities		
Denomination of the formative	Hours	Presence (%)	
activity			
Plenary session and problem /	22.5	25%	
exercise solving			
Lab practices	7.5	8.4%	
	Sistemas de evolucción		
Denomination of the avaluation	Sistemas de evaluacion	Maximum weighting (0/)	
system	(0/2)	wiaxinium weignung (%)	
Dovelopment and chieve	10	100	
tostal on eveneration	10	100	
tests/ or exercises			

Practical tests	10	100
Evaluation of work and	10	100
activities		

UE24: Introduction to Software Engineering

	Subject: Introduction to Software Engineering		
Course			
ECTS	4		
Character	Mandatory		
Semester	3		
Languages in which it	Vietnamese		
Basic and general	GC2 Problem solving ability de	sign ability	
competences	GC5. Ability to apply theoretical	knowledge to practice	
P	GC6. Ability for self-study		
	GC7. Ability to work in a divers	sity group and in an international	
	context (teamwork)		
Specific competences			
	SC19. Skill in secure test plan	design (e. g. unit, integration,	
	system, acceptance).		
Transversal			
competences			
Learning outcomes	On successful completion of this	On successful completion of this course students will be able to:	
	- Students understand the basic co	oncepts of software engineering	
	- Students understand the softwar	e process model	
	- Explain the issues of producing	quality software	
	- Students apply the theory of	software engineering to gather	
	requirements, analyze the re	quirements and write quality	
	Specification documents.	ne duaina quality acftware	
	- Discuss the different aspects in	producing quanty software.	
Contents	- Students have the ability to design test cases for softwares.		
Contents	M2: Software processes		
	M3: Requirements engineering		
	M4 · Design Software		
	M5: Software testing		
	M6: Software evolution		
Observations			
Teaching	Combine teaching theory with practice		
methodologies (include			
list)			
	Formation activities		
Denomination of the	Hours	Presence (%)	
formative activity			
Plenary session and	30	33.3%	
problem / exercise			

solving		
Lab practices	0	0%
	Sistemas de evaluación	
Denomination of the evaluation system	Minimum weighting (%)	Maximum weighting (%)
Developmentandobjectivetests,problem solvingand /orexercises(withpossibilityoffinalexam)	10	100
Practical tests (with possibility of final exam)	10	100
Evaluation of work and activities	10	100

UE25: Data structures and Algorithms

	Subject: Data structures and Algorithms	
Course		
ECTS	6	
Character	Mandatory	
Semester	3	
Languages in which it	Vietnamese	
is taught		
Basic and general	GC2: Problem solving ability, de	sign ability
competences	GC3: Critical thinking	
	GC4: Creativity and Reactivity	
	GC5: Ability to apply theoretical	knowledge to practice
	GC6: Ability for self-study	
	GC10: Representation skill: Abil	ity to represent, illustrate,
C 404	convince	
Specific competences	SC15: The ability to understand s	ecurity demands and design and
	implement software/hardware sec	curity solutions.
	SC1/: The ability to know, under	stand and apply code analysis
Tuongyougol	tecnniques.	
1 ransversar		
L earning outcomes	Explain the role of data structures	and algorithms in computer
Learning outcomes	programming, explaining the rela	tionships between data
	structures, storage structures, and algorithms: distinguish data	
	structure and storage structure: su	immarizes the steps of designing
	algorithms, analyzing and evaluation	ting simple algorithms:
	summarizes, explains the commo	n data structures and operations
	on those data structures; summari	zes, evaluates the complexity of
	sorting and searching algorithms;	Select the appropriate data
	structure and algorithms to match	the problem to be solved; utilize
	pseudo-algorithmic writing and p	rogram from pseudocode.
Contents	M1: Data structures and Algorith	ms
	M2: Arrays and Lists	
	M3: Linked list	
	M4: Tree	
	M5: Graph	
	M6: Sort	
	M7: Search	
Observations		
Teaching	Lecture, Demonstration, Problem solving, Show and tell, Work	
methodologies (include	assignment.	
list)	Formation activities	
Donomination of the	FORMAUON ACUVILIES	Prosonco (%)
formative activity	110015	
Plenary session and	45	33 3%
nroblem / exercise		
solving		
50171115		

Lab practices	0	0%	
Sistemas de evaluación			
Denomination of the evaluation system	Minimum weighting (%)	Maximum weighting (%)	
Development and objective tests, problem solving and / or exercises (with possibility of final exam)	10	100	
Practical tests (with possibility of final exam)	10	100	
Evaluation of work and activities	10	100	

	Subject: Practice for Data structures and Algorithms	
Course		
ECTS	2	
Character	Mandatory	
Semester	3	
Languages in which it	Vietnamese	
is taught		
Basic and general	GC2: Problem solving ability, de	sign ability
competences	GC3: Critical thinking	
-	GC4: Creativity and Reactivity	
	GC5: Ability to apply theoretical	knowledge to practice
	GC6: Ability for self-study	
Specific competences	SC15: The ability to understand s	ecurity demands and design and
	implement software/hardware sec	curity solutions.
	SC17: The ability to know, under	stand and apply code analysis
	techniques.	
	SC19. Skill in secure test plan de	sign (e. g. unit, integration,
	system, acceptance)	
Transversal		
competences		
Learning outcomes	Practice programming of data	structures and algorithms
	learned; Use data structures and algorithms in programming	
	in $C/C++$ to create programs for	or a specific problem; Explain
	the role and importance of data	a structures and algorithms in
	building software.	
Contents	M1: C/C++ programming with st	ack data structures, queues,
	single linked list, double linked li	st, binary tree, graph.
	M2: C/++ programming with sort	ting and searching algorithms.
Observations		
Teaching	Practice, Demonstration, Problem	n solving, Show and tell, Work
methodologies (include	assignment.	
list)	Earmatian activities	
Denomination of the	Formation activities Hours	
formative activity	nours	rresence (%)
Plenary session and	0	0
nrohlem / exercise	0	0
solving		
Lab practices	15	33.3%
F	Sistemas de evaluación	
Denomination of the	Minimum weighting (%)	Maximum weighting (%)
evaluation system		
Development and	10	100
objective tests,		
problem solving and /		
or exercises		
Practical tests	10	100

UE26: Practice for Data structures and Algorithms

Evaluation of work	10	100
and activities		

UE27: Object-Oriented Programming

	Subject: Object-Oriented Programming		
Course			
ECTS	6		
Character	Mandatory		
Semester	3		
Languages in which it	Vietnamese		
is taught			
Basic and general	GC2: Problem solving ability, des	sign ability	
competences	GC3: Critical thinking		
	GC4: Creativity and Reactivity		
	GC5: Ability to apply theoretical	knowledge to practice	
-	GC6: Ability for self-study		
Specific competences	SC15: The ability to understand s	ecurity demands and design and	
	implement software/hardware sec	curity solutions.	
	SC16: Skill in determining how a	security system should work	
	(including its resilience and dependence operations)	or the environment will effect	
	these outcomes	, of the environment will affect	
	SC17. The ability to know under	stand and apply code analysis	
	techniques.	stand and apply code analysis	
Transversal	To see		
competences			
Learning outcomes	Differentiate object-oriented programming with structured		
	programming; Explain the benefits that object-oriented		
	programming provides; Summary	y, explaining the contents of the	
	object-oriented programming met	hod; summarize the steps of	
	analyzing and designing the progr	ram in the object-oriented;	
	Perform object-oriented program	ming analysis and design; Create	
Contonts	M1: C + programming language	L/C ++.	
Contents	M1. C ++ programming ranguage M2: Object-oriented programming methods		
	M3: Object-oriented programming analysis and design		
	M4: Class and object		
	M5: Function overloading and operator overloading		
	M6: Constructor and destructor	C	
	M7: Inheritance		
	M8: Dynamic polymorphism, virtual function		
Observations			
Teaching	Lecture, Demonstration, Problem	solving, Show and tell, Work	
methodologies (include	assignment, Practice.		
list)			
Denomination of the	Formation activities	Presence (%)	
formative activity			
Plenary session and	30	22.2%	
problem / exercise			
solving			

Lab practices	15	11.1%
	Sistemas de evaluación	
Denomination of the evaluation system	Minimum weighting (%)	Maximum weighting (%)
Development and objective tests, problem solving and / or exercises (with possibility of final exam)	10	100
Practical tests (with possibility of final exam)	10	100
Evaluation of work and activities	10	100

UE28: System analysis and design

	Subject: System analysis and design		
Course			
ECTS	6		
Character	Mandatory		
Semester	3		
Languages in which	Vietnamese		
it is taught			
Basic and general			
competences	GC1: The ability to analyze systems, mechanisms and procedures related to protection of information entities and objects GC6: Ability for self-study GC7: Ability to work in a diversity group and in an international		
	context (teamwork)		
Specific			
competences			
Transversal			
competences			
Learning outcomes	skills in analyzing and designing an information system. Introduction of survey methods and specification requirements, from which system		
	architecture data interfaces and systems		
Contents	M1: Overview of System analysis and design		
Contents	M2: Situational survey and demand analysis		
	M3: Object-oriented system analysis	Ş	
	M4: object-oriented system design		
Observations			
Teaching	- Teaching theory		
methodologies	- Doing homework		
(include list)	- Discussion groups		
D	Formation activities		
Denomination of the formation	Hours	Presence (%)	
activity			
Plenary session and	45	33 3%	
problem / exercise			
solving			
Lab practices	0	0%	
	Sistemas de evaluaciór	1	
Denomination of	Minimum weighting (%)	Maximum weighting (%)	
the evaluation			
system		400	
Development and	10	100	
objective tests,			
problem solving			

and / or exercises (with possibility of		
final exam)		
Practical tests (with	10	100
possibility of final		
exam)		
Evaluation of work	10	100
and activities		

UE30: English 2

	Subject: English 2	
Course		
ECTS	6ECTS	
Character	Mandatory	
Semester	4	
Languages in which it	Vietnamese	
is taught		
Basic and general	GC6. Ability for self-study	
competences	GC7. Ability to work in a diver	sity group and in an international
a tet	context (teamwork)	
Specific competences		
Transversal		
competences		
Learning outcomes	English level required is B1 un	der EU frame or equivalent.
Contents	M1: Good luck, bad luck	
	M2: My favourite things	
	M3: Memorable experiences	
	M4: I love chocolate	
	M ₅ : How can I help?	
Observations		
Teaching mothodologies (include	Lecturing	
list)		
	Formation activities	
Denomination of the	Hours	Presence (%)
formative activity		
Plenary session and	45	33.3%
problem / exercise		
solving		
Lab practices	0	0
	Sistemas de evaluación	
Denomination of the evaluation system	Minimum weighting (%)	Maximum weighting (%)
Development and	10	100
objective tests,		
problem solving and /		
or exercises (with		
possibility of final		
exam)		
Practical tests (with	10	100
possibility of final		
exam)	10	100
Evaluation of work	10	100
and activities		

UE31: Principles of operating systems

	Subject: Principles of operating systems	
Course		
ECTS	6	
Character	Mandatory	
Semester	4	
Languages in which it is taught	Vietnamese	
Basic and general competences	GC1: The ability to analyze systems, mechanisms and procedures related to protection of information entities and objectsGC5: Ability to apply theoretical knowledge to practiceGC6: Ability for self-study	
Specific competences		
Transversal competences		
Learning outcomes	Learners can revisit the general principles of operating systems, compare the similarities and differences in the principles between typical operating system families. Performs installation of algorithms that simulate the operation of the operating system. Analyze and evaluate the pros and	
Contents	M1: General introduction	
	M2: Operating system structure M3: Process M4: Thread M5: Process synchronization M6: CPU scheduling M7: Deadlock M8: Main memory M9: Virtual memory M10: I/O management and disk scheduling	
Observations		
Teaching methodologies (include list)	 Teaching theory Doing homework Discussion groups 	
Denomination of the formative	Hours Presence (%)	
activity	nours	Tresence (70)
Plenary session and problem /	45	33.3%
Lab practices	0	0%
P	Sistemas de evaluación	
Denomination of the evaluation system	Minimum weighting (%)	Maximum weighting (%)
Development and objective tests, problem solving and / or exercises (with possibility of final exam)	10	100

Practical tests (with possibility of final exam)	10	100
Evaluation of work and activities	10	100

UE32 : Computer networks

	Subject: Computer networks	
Course		
ECTS	6	
Character	Mandatory	
Semester	4	
Languages in which it is taught	Vietnamese	
Basic and general competences	GC1. The ability to analyze systems, mechanisms and	
	procedures related to protection of information entities and	
	objects	
	GC3. Critical thinking	
	GC6. Ability for self-study	
	GC11. Skill in conducting trend analysis	
Specific competences	SC13. Skill in conducting vulnerability scans, recognizing	
	and categorizing vulnerabilities in security systems.	
	SC14. To understand and to apply the up-to-date methods,	
	protect the system	
	SC15. The ability to understand security demands and design	
	and implement software/hardware security solutions	
	SC16. Skill in determining how a security system should	
	work (including its resilience and dependability capabilities)	
	and how changes in conditions, operations, or the	
	environment will affect these outcomes.	
	SC17. The ability to know, understand and apply code	
	analysis techniques.	
	SC18. The ability to know, understand and apply security	
	event correlation techniques and tools.	
	SC21. Skill in analyzing and predicting trends in security	
	aspects.	
	SC22. Skill in analyzing anomalous code as malicious or	
	benign.	
	SC23. The ability to know, understand and apply binary	
	analysis techniques and tools.	
	SC24. Skill in performing damage assessments.	
	SC26. To design/establish security policies, privacy policies	
	and standards	
	SC29. Ability to describe and illustrate the risks, threats and	
	solutions	
	SC31. The ability to know, understand and apply database	
	security techniques.	
	SC32. The ability to know, understand and apply cloud	
	computing security solutions.	
Transversal competences		
Learning outcomes	- Introduce the basic knowledge about the architecture and	
	principles of computer network; especially focus on the	
	Internet architecture and the principles of Internet	
	protocols.	
	- Analyze packets of different protocol layers.	
	- Install and configure some network devices	

Contents	M1: Introduction to computer	networks	
	M2: Application layer		
	M3: Transport laver		
	M4: Network layer		
	M5: Data link laver		
	M6: Physical laver		
Observations			
Teaching methodologies	- Teaching theory		
(include list)	- Doing homework		
(include list)	- Discussion groups		
	Formation activities		
Denomination of the formative	Hours	Presence (%)	
activity	nours	Tresence (70)	
Planary sossion and problem /	37 5	280/2	
avoroiso solving	57.5	2070	
Lab practices	7.5	5 6 9/	
		5.0%	
	Evaluation semester		
Denomination of the evaluation	Minimum weighting (%)	Maximum weighting (%)	
system	10	100	
Development and objective	10	100	
tests, problem solving and / or			
exercises (with possibility of			
final exam)			
Practical tests (with possibility	10	100	
of final exam)			
Evaluation of work and	10	100	
activities			

	Subject: Detecting Security Bugs and Vulnerabilities in	
	Software	
Course		
ECTS	4	
Character	Mandatory	
Semester		
Languages in which it	Vietnamese	
is taught		
Basic and general	GC1: The ability to analyze systems, mechanisms and procedures	
competences	related to protection of information entities and objects	
_	GC2: Problem solving ability, design ability	
	GC3: Critical thinking	
	GC5: Ability to apply theoretical knowledge to practice	
	GC6: Ability for self-study	
	GC7: Ability to work in a diversity group and in an international	
	context (teamwork)	
	GC8: Ability to project organization and planning	
Specific competences	SC13: Skill in conducting vulnerability scans, recognizing and	
	categorizing vulnerabilities in security systems.	
	SC14: To understand and to apply the up-to-date methods, tools,	
	software and techniques to analyze risks, threats and protect the	
	system.	
	SC15: The ability to understand security demands and design and	
	implement software/hardware security solutions	
	SC16: Skill in determining how a security system should work	
	(including its resilience and dependability capabilities) and how	
	changes in conditions, operations, or the environment will affect	
	these outcomes.	
	SC17: The ability to know, understand and apply code analysis	
	techniques.	
	SC18. The ability to know, understand and apply security event	
	correlation techniques and tools.	
	SC19: Skill in secure test plan design (e. g. unit, integration,	
	system, acceptance)	
	SC20. Skill in developing, testing, and implementing network	
	infrastructure contingency and recovery plans.	
	SC22. Skill in analysing anomalous code as malicious or benign.	
	SC23. The ability to know, understand and apply binary analysis	
	techniques and tools.	
	SC26. To design/establish security policies, privacy policies and	
	standards	
	SC31: The ability to know, understand and apply database security	
	techniques	
	SC32: The ability to know, understand and apply cloud computing	
	security solutions	
Transversal		
competences		
Learning outcomes	Understanding the basics of information security in software	
	development. Have the knowledge of the common security	
	vulnerabilities in the program, understand the risk of attack can	
	occur on the software, so that there are solutions to ensure the	
	security of the software.	

Contents	M1: Overview		
	M2: General Safety Information		
	M3: Buffer Overflows		
	M4: Unvalidated Input		
	M5: TAIN Analysis		
	M6: The vulnerabilities in web p	rogramming	
	M7: Vulnerabilities in mobile pro	ogramming	
Observations	I I I I I I I I I I I I I I I I I I I		
Teaching	Presentations Lab practices and	Projects	
methodologies (include	resentations, Luc practices and	10,000	
list)			
	Formation activities		
Denomination of the	Hours	Presence (%)	
formative activity			
Plenary session and	22.5	25%	
nrohlem / evercise		2070	
solving			
Lab practices	7.5	8.3%	
	Sistemas de evaluación		
Denomination of the	Minimum weighting (%) Maximum weighting (%)		
evaluation system			
Development and	10	100	
objective tests		100	
nrohlem solving and /			
or evercises (with			
nossibility of final			
evam)			
Practical tasts (with	10	100	
nossibility of final	10	100	
possibility of fillat			
Evaluation of work	10	100	
Evaluation of WOrk	10	100	
and activities			

UE34: Algorithms and Complexity

	Subject: Algorithms and Complexity		
Course			
ECTS	4		
Character	Mandatory		
Semester	4		
Languages in which it is taught	Vietnamese		
Basic and general	GC3. Critical thinking		
competences	GC5. Ability to apply the GC6. Ability for self-stud	oretical knowledge to practice	
Specific competences	SC15. The ability to understa	and security demands and design	
	and implement software/hard	ware security solutions	
	SC18. The ability to know,	understand and apply security	
	event correlation techniques a	ind tools.	
	SC25. Ability to evaluate risk	s (risk assessment)	
Transversal competences			
Learning outcomes	Understand the definition of a	llgorithms complexity	
	Ability of evaluating the com	plexity of some algorithms	
	Understanding the definition	on of NP complete, NP hard	
	problems		
Contents	M1: Introduction to algorithms and complexity		
	M3: NP-complete & NP-hard		
Observations			
Teaching methodologies	Presentations, practice exercises, discussions		
(include list)			
	Formation activities		
Denomination of the	Hours	Presence (%)	
formative activity			
Plenary session and problem / exercise solving	30	33.3%	
Lab practices	0	0	
-	Sistemas de evaluación		
Denomination of the	Minimum weighting (%)	Maximum weighting (%)	
evaluation system			
Development and	10	100	
objective tests, problem			
solving and / or exercises			
(with possibility of final			
exam)	10	100	
Practical tests (with	10	100	
possibility of final exam)	10	100	
evaluation of work and activities	10	100	

UE35: Web Application Development
Course Image: Constant of the second sec		Subject: Web Application Deve	lopment
Contact 6 Character Mandatory Semester Image: Contact of the second	Course		
Character Mandatory Semester	FCTS	6	
Character Mandatory Semester Ianguages in which it is taught Vietnamese Basic and general competences GC2. Problem solving ability, design ability (GC5. Ability to apply theoretical knowledge to practice GC6. Ability for self-study GC7. Ability to work in a diversity group and in an international context (teanwork) Specific competences SC17. The ability to know, understand and apply code analysis techniques. Transversal competences SC17. The ability to know, understand and apply code analysis techniques. Transversal competences To understand the concept of Web Application Development. To understand the differences between client side & server side technologies to develop Web Application To understand and practice web age with HTML, CSS, JavaScript for Front-end. Contents M1: Overview the Internet and WWW M2: HyperText Markup Language (HTML) M3: Cascading Style Sheets (CSS) M4: JavaScript for Front-end M5: The Document Object Model (DOM) M6: Front-end Frameworks Combine teaching theory with practice Denomination of the formation activities Presence (%) Plenary session and problem / exercise 30 22.2% Pohlem / exercise 15 11.1% Lab practices 15 11.1% Decommination of the exercise evaluación	LCIS	0	
Semester Image: Completences Basic and general completences GC2. Problem solving ability, design ability GC5. Ability to apply theoretical knowledge to practice GC6. Ability to apply theoretical knowledge to practice GC6. Ability to work in a diversity group and in an international context (teamwork) Specific completences SC17. The ability to know, understand and apply code analysis techniques. Transversal completences To understand the concept of Web Application Development. To understand the differences between client side & server side technologies to develop Web Application To understand the differences between client side & server side technologies to develop Web Application To understand the differences between client side & server side technologies to develop Web Application To understand the differences between Client side & server side technologies to develop Web Application Contents M1: Overview the Internet and WWW W2: HyperText Markup Language (HTML). M3: Cascading Style Sheets (CSS) M4 : JavaScript for Front-end M5: The Document Object Model (DOM) M6: Front-end Frameworks Observations Teaching Teaching methodologies (include list) Solving S0 Lab practices I5 Isto Sistemas de evaluación Denomination of the evaluation system Minimum weighting (%)	Character	Mandatory	
Languages in which it is taught Vietnamese Basic and general competences GC2. Problem solving ability, design ability GC5. Ability to apply theoretical knowledge to practice GC6. Ability for self-study GC7. Ability to work in a diversity group and in an international context (teamwork) Specific competences SC17. The ability to know, understand and apply code analysis techniques. Transversal competences To understand the concept of Web Application Development. To understand the differences between client side & server side technologies to develop Web Application To understand and practice web page with HTML, CSS, JavaScript for Front-end. Contents M1: Overview the Internet and WWW M2: HyperText Markup Language (HTML) M3: Cascading Style Sheets (CSS) M4 : JavaScript for Front-end M5: The Document Object Model (DOM) M6: Front-end Frameworks Observations Combine teaching theory with practice methodologies (include list) Teaching methodologies (include list) Solo Plenary session and problem / exercises 30 Jab practices 15 Lab practices 15 Lab practices 15 Lab practices 10 M0 M0 Prevelopment and poblem solving and / or exercise (with 100	Semester		
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GC6. Ability for self-study GC7. Ability to work in a diversity group and in an international context (teamwork) Specific competences SC17. The ability to know, understand and apply code analysis techniques. Transversal competences SC17. The ability to know, understand and apply code analysis techniques. Learning outcomes To understand the concept of Web Application Development. To understand the Essentials of Web Application To understand the differences between client side & server side technologies to develop Web Application To understand and practice web page with HTML, CSS, JavaScript for Front-end. Contents M1: Overview the Internet and WWW M2: HyperText Markup Language (HTML) M3: Cascading Style Sheets (CSS) M4: JavaScript for Front-end M5: The Document Object Model (DOM) M6: Front-end Frameworks Combine teaching theory with practice Denomination of the formative activity Formation activities Plenary session and problem / exercise 30 Lab practices 15 11.1% Denomination of the evolution system Mininum weighting (%) Maximum weighting (%) Pervelopment and 10 100 100	competences	GC5. Ability to apply theoretical	knowledge to practice
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To understand the Essentials of Web Application Development. To understand the differences between client side & server side technologies to develop Web Application To understand and practice web page with HTML, CSS, JavaScript for Front-end.ContentsM1: Overview the Internet and WWW M2: HyperText Markup Language (HTML) M3: Cascading Style Sheets (CSS) M4: JavaScript for Front-end M5: The Document Object Model (DOM) M6: Front-end FrameworksObservationsCombine teaching theory with practiceTeaching methodologies (include list)Combine teaching theory with practicePenomination of the formative activityHoursPresence (%)Plenary session and problem / exercise solving3022.2%Denomination of the evaluation systemMinimum weighting (%)Maximum weighting (%)Development and objective tiveIn 00More activitiesDevelopment and jointIn 00Maximum weighting (%)	Learning outcomes	To understand the concept of We	b Application Development
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M3: Cascading Style Sheets (CSS) M4: JavaScript for Front-end M5: The Document Object Model (DOM) M6: Front-end Frameworks Observations Teaching methodologies (include list) Combine teaching theory with practice Formation activities Denomination of the formative activity Plenary session and problem / exercise solving Lab practices 15 Sistemas de evaluación Denomination of the evaluation system 10 Objective tests, problem solving and / or exercises (with With evelopment and 10 Use of formation and problem solving and / or exercises (with		M2: HyperText Markup Languag	ge (HTML)
M4 : JavaScript for Front-end M5: The Document Object Model (DOM) M6: Front-end Frameworks Observations		M3: Cascading Style Sheets (CSS	5)
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Prenary session and problem / exercise solving 50 22.2% Lab practices 15 11.1% Lab practices 15 11.1% Denomination of the evaluation system Minimum weighting (%) Maximum weighting (%) Development and objective tests, problem solving and / or exercises (with with the formula to the formula	Dispany sossion and	20	22.29/
problem / exercise solving 1 Lab practices 15 Sistemas de evaluación Denomination of the evaluation system Minimum weighting (%) Development and objective tests, problem solving and / or exercises (with 10	rienary session and	50	22.270
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Denomination of the evaluation system Minimum weighting (%) Maximum weighting (%) Development and objective tests, problem solving and / or exercises (with 10 100		15 Sistemas de evaluación	11.1 /0
Development and 10 100 objective tests, 100 or exercises (with	Denomination of the	Minimum weighting (%)	Maximum weighting (%)
Development and 10 100 objective tests, 100 or exercises (with	evaluation system		
objective tests, problem solving and / or exercises (with	Development and	10	100
problem solving and / or exercises (with	objective tosts	10	100
or exercises (with	nrohlem solving and /		
	or exercises (with		
Dossibility of final	possibility of final		

exam)		
Practical tests (with	10	100
possibility of final		
exam)		
Evaluation of work	10	100
and activities		

UE36: Java Programming

	Subject: Java Programming	
Course		
ECTS	6	
Character	0 Ontional	
Character		
Semester	1 X ⁷ 4	
is taught	vietnamese	
Basic and general	GC1. The ability to analyze sys	tems, mechanisms and
competences	procedures related to protection of	f information entities and objects
•	GC5: Ability to apply theoretical	knowledge to practice
	GC6: Ability for self-study	
	GC7. Ability to work in a div	ersity group and in an
	international context (teamwork)	
	GC10. Representation skill: Abi	lity to represent, illustrate,
	convince	
Specific competences	SC15. The ability to understand s	ecurity demands and design and
	implement software/hardware sec	curity solutions
	SC17. The ability to know, under	stand and apply code analysis
	techniques.	
	SC18. The ability to know, under	stand and apply security event
	correlation techniques and tools.	
	SC22. Skill in analysing anomalo	us code as malicious or benign.
Transversal		
competences	Understand basis knowledge and	abilla in Java na arammina
Learning outcomes	Ability of applying to build Iava	deskton application
Contonts	M1: Overview of Iava programmi	
Contents	M1. Overview of Java programming M2. The basic programming struc	tures in Iava
	M2: Classes and Objects	
	M4: Object-oriented features in Ia	va
	M5: Streams and files	
	M6: Programming with database	
	M7: Designing user interfaces	
Observations		
Teaching	Presentations, Lab practices and I	Projects
methodologies (include		c .
list)		
	Formation activities	
Denomination of the	Hours	Presence (%)
formative activity		
Plenary session and	30	22.2%
problem / exercise		
solving		
Lab practices		11.1%
Demonstruction of the	Sistemas de evaluación	
Denomination of the	winimum weighting (%)	Maximum weighting (%)
Development - 1	10	100
Development and	10	100
noblem solving and (
or overeises (with		
UI CACICISCS (WILLI		

possibility of final exam)		
Practical tests (with possibility of final exam)	10	100
Evaluation of work and activities	10	100

UE37: Computer network design

	Computer network design	
Course		8
ECTS	6	
Character	Optional	
Semester	4	
Languages in which it is taught	Vietnamese	
Basic and general competences	GC2. Problem solvin	g ability, design ability
g	GC5. Ability to apply theoretical knowledge to practice GC6: Ability for self-study	
Specific competences	SC15. The ability to understand security demands and design and implement software/hardware security solutions SC20. Skill in developing, testing, and implementing network infrastructure contingency and recovery plans.	
Transversal competences		
Learning outcomes	 Knowledge: students can classify network types, network devices by the functional, maker, design and configuration method. Technique: Design different network types; Configure Cisco's switches and routers. Others: Cooperation in group; Working independent or collaborative. 	
Contents	M1: Identify the needs and objectives of clients	
	M2: Logical network design M3: Physical network design M4: Testing, Optimization, Writing Network design documentation	
Observations		
Teaching (include list) methodologies	Teaching theoryDoing homeworkDiscussion groups	
	Formation activities	
Denomination of the formative activity	Hours	Presence (%)
Plenary session and problem / exercise solving	30	22.2%
Lab practices	15	11.1%
	Sistemas de evaluación	
Denomination of the evaluation	Minimum weighting	Maximum weighting (%)
system	(%)	
Development and objective tests, problem solving and / or exercises (with possibility of final exam)	e 10 100 r f	
Practical tests (with possibility of final exam)	10	100
Evaluation of work and activities	10	100

UE38: English for ICT studies

	Subject: English for ICT	S studies
Course		
ECTS	4ECTS	
Character	Mandatory	
Semester	5	
Languages in which it is taught	Vietnamese	
Basic and general competences	GC6. Ability for self-study GC7. Ability to work in a diversity group and in an international context (teamwork)	
Specific competences		
Transversal competences		
Learning outcomes	Read and understand t materials related to IT, handle some common to write simple report	the main ideas of a report or using English to express and professional situations; Ability s, present opinions related to
	professional work.	
Contents	M1: ICT in the workplace M2: Introduction to ICT systems M3: ICT in education M4: The Internet M5: Software development	
Observations	*	
Teaching methodologies (include list)	Lecturing	
Formation activities		
Denomination of the formative activity	Hours	Presence (%)
Plenary session and problem / exercise solving	30	33.3%
Lab practices	0	0
	Sistemas de evaluación	
Denomination of the evaluation system	Minimum weighting (%)	Maximum weighting (%)
Development and objective tests, problem solving and / or exercises (with possibility of final exam)	10	100
Practical tests (with possibility of final exam)	10	100
Evaluation of work and activities	10	100

UE39: Ho Chi Minh Idcology

Subject: Ho Chi Minh Idcology

Course		
ECTS	4ECTS	
Character	Mandatory	
Semester	5	
Languages in which it	Vietnamese	
is taught		
Basic and general	GC3. Critical thinking	
competences	GC6. Ability for self-study	
	GC10. Representation skill: A	Ability to represent, illustrate,
	convince	
Specific competences		
Transversal		
competences		
Learning outcomes	Students can apply knowledge of	f social science and humanities to
	career and life.	
Contents	M1: Establishment, formation an	d development of Ho Chi Minh
	ideology	
	M2: Ho Chi Minh's thoughts on r	national issues and the revolution
	of national liberation	
	M3: Ho Chi Minn Ideology of so	claiism and the transitional road
	M4: Ho Chi Minh ideology of the	Communist Party of Vietnam
	M5: Ho Chi Minh's thoughts on t	be great national unity and
	international unity	ne great national unity and
	M6: Ho Chi Minh's idea of build	ing the state of the people, by the
	people, for the people	
	M7: Ho Chi Minh's thoughts on c	culture, morality and building
	new people	·
Observations		
Teaching	Lecturing	
methodologies (include		
list)		
	Formation activities	
Denomination of the	Hours	Presence (%)
Iormative activity	20	22.20/
Plenary session and	30	33.3%
solving		
Lah practices	0	0
	Sistemas de evaluación	· ·
Denomination of the	Minimum weighting (%)	Maximum weighting (%)
evaluation system		
Development and	10	100
objective tests,		
problem solving and /		
or exercises (with		
possibility of final		

exam)		
Practical tests (with	10	100
possibility of final		
exam)		
Evaluation of work	10	100
and activities		

UE40: Modeling and Control

Subject: Modeling and Control

Course		
ECTS	4	
Character	Mandatory	
Semester	5	
Languages in which it	Vietnamese	
is taught		
Basic and general	GC1. The ability to analyze syste	ems, mechanisms and procedures
competences	related to protection of information	on entities and objects
	GC3. Critical thinking	
	GC6. Ability for self-study	
Specific competences	SC13. Skill in conducting vuln	erability scans, recognizing and
	categorizing vulnerabilities in sec	curity systems.
	SC17. The ability to know, und	lerstand and apply code analysis
	techniques.	
	SC21. Skill in analysing and pred	licting trends in security aspects.
	SC22. Skill in analysing anomalo	us code as malicious or benign.
	SC26. To design/establish secur	ity policies, privacy policies and
	standards	
Transversal		
competences		
Learning outcomes	Students can collect, analyze and process data to build simulation	
Gentenda	M1. The Basics of System Modelling	
Contents	M1: The Dasics of System Model M9: System model	ung
	M2: System model M2: Simulation method	
	M4: Computer methods for mode	alling automated control systems
	M ₄ : Computer methods for mode	n
	M6: Modelling of random system	2 2
	M7: Simulate the queue system	3
	M8: Application Ident Tool in ma	atlab to build a modelling
	automated control system	and to build a modeling
Observations		
Teaching	Presenting on theory	
methodologies (include		
list)		
	Formation activities	
Denomination of the formative activity	Hours	Presence (%)
Plenary session and	22.5	25%
nrohlem / evercise		25 /0
solving		
solving		
Lab practices	7.5	8.3%
	Sistemas de evaluación	
Denomination of the	Minimum weighting (%)	Maximum weighting (%)
evaluation system	10	100
Development and	10	100
nuplective tests,		
problem solving and /		
ut exercises (with		

possibility of exam)	final		
Practical tests possibility of exam)	(with final	10	100
Evaluation of and activities	work	10	100

UE41: Information security

	Information security
Course	

ECTS	4		
Character	Mandatory		
Semester	3		
Languages in which it is taught	Vietnamese		
Basic and general			
competences	GC6: Ability for self-stud	у	
	GC7: Ability to work in a	diversity group and in an international	
	context (teamwork)	conjustion and planning	
	GC8: Additive to project of GC9: Time management s	ganization and planning	
	OC). This management s		
Specific competences	SC23. The ability to kn	ow, understand and apply binary	
	analysis techniques and too	ls.	
Transversal competences			
Learning outcomes	Introduces an overview of information security. Provides basic		
	principles and primitives in information security.		
Contents	M1: Overview of Information security		
	M2: Confidentiality M3: Integrity		
	M4: Trust		
Observations			
Teaching methodologies	- Teaching theory		
(include list)	- Doing homework		
	- Discussion groups		
	Formation activities		
formative activity	Hours	Presence (%)	
Plenary session and problem	30	33.3%	
/ exercise solving		0.07	
Lab practices	U Sistemas de evoluerión	0%	
Denomination of the	Sistemas de evaluación Minimum weighting	1 Maximum weighting (%)	
evaluation system	(%)	Waxinum weighting (70)	
Development and objective	10	100	
tests, problem solving and /			
or exercises (with possibility			
of final exam)			
Practical tests (with	10	100	
Fyelustion of work and	10	100	
activities	10	100	

UE42: Cryptology and Applications

	Subject: Cryptology and Applications
Course	

ECTS	6		
Character	Mandatory		
Semester			
Languages in which it is taught	Vietnamese		
Basic and general	GC2. Problem solving ability, des	sign ability	
competences	GC4. Creativity and Reactivity		
•	GC5. Ability to apply theoretical knowledge to practice		
	GC6. Ability for self-study		
Specific competences	SC15. The ability to understand	security demands and design and	
	implement software/hardware security solutions		
	SC17. The ability to know, understand and apply code analysis		
	techniques.		
	SC21. Skill in analysing and pred	icting trends in security aspects.	
	SC22. Skill in analysing anomalo	us code as malicious or benign.	
	SC25. Ability to evaluate risks (ri	isk assessment)	
	SC26. To design/establish security policies, privacy policies and		
	SC31 The ability to know under	stand and annly database security	
	scol. The ability to know, understand and apply database security techniques		
Transversal			
competences			
Learning outcomes	Students understand the principles of a symmetric key system and		
	the public and application cryptosystems. Analyze and compare		
	the fundamental differences between the symmetric cryptosystem		
	and the public cryptosystem.		
	Students know how to distribute key to cryptosystem. Understand		
	the principles of capturing and storing security keys, security		
C	protocols		
Contents	M1: General introduction		
	M2: Full secret encryption M2: Symmetric encryption		
	M4: Message authentication code		
	M4: Hash functions and applicati	ons	
	M5: Build symmetric code in reality		
	M6: Key management		
	M7: Public encryption		
	M8: Electronic Signature		
Observations			
Teaching	Presenting on theory		
methodologies (include	Guiding classroom discussions		
	Eormation activities		
Denomination of the	Hours	Presence $(\%)$	
formative activity	Hours	Tresence (70)	
Plenary session and	45	33.3%	
problem / exercise			
solving			
Lab practices	0		
Sistemas de evaluación			

Denomination of the evaluation system	Minimum weighting (%)	Maximum weighting (%)
Developmentandobjectivetests,problem solvingand /orexercises(with	10	100
possibility of final exam)		
Practical tests (with possibility of final exam)	10	100
Evaluation of work and activities	10	100

UE43: Linux and Open – source software

	Subject: Linux and Open – source software
Course	
ECTS	6

Character I	Mandatory		
Semester 5	5		
Languages in which it	Vietnamese		
is taught			
Basic and general (GC2. Problem solving ability, des	sign ability	
competences (GC5. Ability to apply theoretical	knowledge to practice	
	GC6. Ability for self-study		
Specific competences S	SC15. The ability to understand s	security demands and design and	
i	implement software/hardware sec	urity solutions	
Transversal			
competences			
Learning outcomes	Understand the basic knowledge	e of open - source software and	
	Linux operating system		
	Ability to use PHP and MySQL to	o develop applications in practice	
Contents	M1: Introduction of open source software		
I I	M2: Introduction to Linux operating system		
l I	M3: Exploiting open source software		
	M4: Building and developing open source software		
Observations			
Teaching	Lecturing, demonstration, work assignment, practice		
methodologies	odologies		
	Formation activities		
Denomination of the I	Hours	Presence (%)	
formative activity			
Plenary session and a	30	22.2%	
problem / exercise			
solving	1 7	11 10/	
Lab practices		11.1%	
	Sistemas de evaluacion		
Denomination of the	Minimum weighting (%)	Maximum weighting (%)	
evaluation system	10	100	
Development and	10	100	
objective tests,			
problem solving and /			
or exercises (with			
over a structure of the			
Dreatical tasta (with 1	10	100	
ractical tests (with]	10	100	
over a structure of the			
Evaluation of work 1	10	100	
Evaluation of work			

UE44: Back-end web development

	Subject: Back-end web development
Course	
ECTS	6

Character Mandatory Semester 3 Languages in which it is taught Vietnamese Basic and general competences GC1: The ability to analyze systems, mechanisms and procedures related to protection of information entities and objects GC5: Ability to apply theoretical knowledge to practice GC6: Ability for self-study Specific competences SC20. Skill in developing, testing, and implementing network infrastructure contingency and recovery plans. Transversal competences Introduces an overview of Back-end web development. Provides basic skills in analyzing and designing a Back-end web system. M1: Overview of Web server and web back-end application M2: Statefull and stateless architectures M3: Asynchronous and parallel in HTTP Request processing M4: Working with Database meanscent systems
Semester3Languages in which it is taughtVietnameseBasic and general competencesGC1: The ability to analyze systems, mechanisms and procedures related to protection of information entities and objects GC5: Ability to apply theoretical knowledge to practice GC6: Ability for self-studySpecific competencesSC20. Skill in developing, testing, and implementing network infrastructure contingency and recovery plans.Transversal competencesIntroduces an overview of Back-end web development. Provides basic skills in analyzing and designing a Back-end web system.ContentsM1: Overview of Web server and web back-end application M2: Statefull and stateless architectures M3: Asynchronous and parallel in HTTP Request processing M4: Working with Detabace meangement systems
Semester3Languages in which it is taughtVietnameseBasic competencesand general GC1: The ability to analyze systems, mechanisms and procedures related to protection of information entities and objects GC5: Ability to apply theoretical knowledge to practice GC6: Ability for self-studySpecific competencesSC20. Skill in developing, testing, and implementing network infrastructure contingency and recovery plans.Transversal competencesIntroduces an overview of Back-end web development. Provides basic skills in analyzing and designing a Back-end web system.ContentsM1: Overview of Web server and web back-end application M2: Statefull and stateless architectures M3: Asynchronous and parallel in HTTP Request processing M4: Working with Database menagement systems
Languages in which it is taughtVietnameseBasic competencesand general GC1: The ability to analyze systems, mechanisms and procedures related to protection of information entities and objects GC5: Ability to apply theoretical knowledge to practice GC6: Ability for self-studySpecific competencesSC20. Skill in developing, testing, and implementing network infrastructure contingency and recovery plans.Transversal competencesIntroduces an overview of Back-end web development. Provides basic skills in analyzing and designing a Back-end web system.ContentsM1: Overview of Web server and web back-end application M2: Statefull and stateless architectures M3: Asynchronous and parallel in HTTP Request processing M4: Working with Database menagement systems
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related to protection of information entities and objects GC5: Ability to apply theoretical knowledge to practice GC6: Ability for self-studySpecific competencesSC20. Skill in developing, testing, and implementing network infrastructure contingency and recovery plans.Transversal competencesIntroduces an overview of Back-end web development. Provides basic skills in analyzing and designing a Back-end web system.ContentsM1: Overview of Web server and web back-end application M2: Statefull and stateless architectures M3: Asynchronous and parallel in HTTP Request processing M4: Working with Database menagement systems
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M2: Statefull and stateless architectures M3: Asynchronous and parallel in HTTP Request processing M4: Working with Detabase management systems
M3: Asynchronous and parallel in HTTP Request processing
N/// N/ orizing with Detebage menogement avatoms
1914. WORKING WITH Database management systems
MS: Challenges in building a big web back-end development
Teaching methodologies Teaching theory
(include list)
- Discussion groups
Formation activities
Denomination of the Hours Presence (%)
formative activity
Plenary session and 30 22.2%
problem / exercise solving
Lab practices1511.1%
Sistemas de evaluación
DenominationoftheMinimum weighting (%)Maximum weighting (%)
evaluation system
Development and 10 100
objective tests, problem
solving and / or exercises
Practical tests (with 10 100
possibility of final exam) Evaluation of work and 10
activities

UE45: Network adminnistration

	Subject: Network adminnistration
Course	
ECTS	6
Character	Optional
Semester	4

Languages in which it is taught	Vietnamese		
Basic and general competences	GC2: Problem solving a	bility, design ability	
	GC3: Critical thinking		
	GC4: Creativity and Rea	activity	
	GC6: Ability for self-stu	ıdy	
	GC7: Ability to work in a diversity group and in		
	an international context (teamwork)		
	GC8: Ability to project of	organization and	
	planning		
	GC9: Time management	t skill	
	GC10: Representation sl	kill: Ability to represent,	
	illustrate, convince		
	GCTT: Skill in conductin	ng trend analysis	
Transversel competences			
I ransversal competences	Identify year requirement	nta hafana danlaring tha	
Learning outcomes	notwork	his before deploying the	
	Determine specific servi	ces for each system	
	Explain the need to	use group policy and	
	network security	use group poney and	
	Deploy basic services s	uch as DNS. DHCP. IP	
	address configuration		
	Apply group policy to	b deploy software, and	
	increase network sec	urity using Windows	
	operating systems.		
Contents	M1: Windows Server 2012: Introduction, Install		
	and Configuration		
	M2: Active Directory Domain Services		
	M3: IPv4		
	M4: Dynamic Host Con	figuration Protocol	
	M5: Domain Name Syst	em	
	M6: IPv6	•, •	
	M /: Group Policy and security configuration		
Ubservations Teaching methodologies (include list)	Taashing theory		
reaching methodologies (metude list)	- reaching theory		
	- Discussion groups		
Forma	tion activities		
Denomination of the formative activity	Hours	Presence (%)	
Plenary session and problem / exercise	30	22.2%	
solving			
Lab practices	15	11.1%	
Evalua	tion semester		
Denomination of the evaluation system	Minimum weighting	Maximum weighting	
	(%)	(%)	
Development and objective tests,	10	100	
problem solving and / or exercises (with possibility of final ayam)			
possibility of final exam) Practical tasts (with passibility of final	10	100	
evam)	10	100	
Evaluation of work and activities	10	100	
Evaluation of work and activities	10	100	

UE46: Revolutionary guideline of Vietnamese Communist Party

	Subject: Revolutionary Communist Party	guideline	of	Vietnamese
Course				
ECTS	6ECTS			

Character	Mandatory	
Semester	6	
Languages in which it is	Vietnamese	
taught		
Basic and general	GC3. Critical thinking	
competences	GC6. Ability for self-stud	ły
	GC10. Representation ski	ll: Ability to represent, illustrate,
	convince	
Specific competences		
Transversal competences	Fransversal competences	
Learning outcomes	Students can apply know	owledge of social science and
	humanities to career and 1	ife
Contents	M1: The birth of the Com	munist Party of Vietnam and the
	first political program of th	ne
	Party	61000 1045
	M2: The way to fight the government of 1930-1945	
	M3: The Resistance colonialism and the Great American	
	IIIVasion M4: Industrialization	
	M5: The way to a market economy oriented socialist	
	M6: The way to build the political system	
Observations		
Teaching methodologies	Lecturing	
(include list)		
	Formation activities	
Denomination of the	Hours	Presence (%)
formative activity		
Plenary session and problem /	45	33.3%
exercise solving		-
Lab practices		0
Sistemas de evaluación		
Denomination of the	Minimum weighting	Maximum weighting (%)
evaluation system	(%)	100
tosts problem solving and / or	10	100
evercises		
Practical tests	10	100
Evaluation of work and	10	100
activities		

UE47: Environmental Management

UE48: Economics of Trade and Services

г

	Subject: Environmental Management	
Course		
ECTS	4ECTS	
Character	Mandatory	
Semester	6	
Languages in which it	Vietnamese	
is taught	v iethaniese	
Basic and general	GC2 Problem solving ability	design ability
competences	GC6 Ability for self-study	
	GC8 Ability to project organization and planning	
Specific competences		
Transversal		
competences		
Learning outcomes	Present basic knowledge on en	vironmental protection
Contents	M1: Basic issues of environmental	management
Contents	M2. The basis of environmental n	nanagement
	M3: Tools in environmental man	agement
	M4: State management system for	environmental protection and
	environmental inspection	environmental protection and
	M5: Environmental management	of urban and industrial zones
	M6: Environmental management	of rural and craft villages
Observations		0
Teaching	Presenting on theory	
methodologies (include		
list)		
	Formation activities	
Denomination of the	Hours	Presence (%)
formative activity		
Plenary session and	30	33.3%
problem / exercise		
solving		
Lab practices	0	0
	Evaluation systems	
Denomination of the	Minimum weighting (%)	Maximum weighting (%)
evaluation system		
Development and	10	100
objective tests,		
problem solving and /		
or exercises (with		
possibility of final		
exam)		
Practical tests (with	10	100
possibility of final		
exam)		
Evaluation of work	10	100
and activities		

	Subject: Economics of Trade and Services	
Course		
ECTS	4ECTS	
Character	Mandatory	
Semester	6	
Languages in which it	Vietnamese	
is taught		
Basic and general	GC2. Problem solving ability	design ability
competences	GC6. Ability for self-study	
•	GC8. Ability to project organ	ization and planning
Specific competences		
Transversal		
competences		
Learning outcomes	Present basic knowledge on ma	anagement, economics
Contents	M1: General introduction of trade	and services
	M2: Distribution system of goods	and services
	M3: E- commerce	
	M4: Economic services	
	M5: Business services and integrat	tion
Observations		
Teaching	Presenting on theory	
methodologies (include		
list)		
	Formation activities	
Denomination of the	Hours	Presence (%)
formative activity		
Plenary session and	30	33.3%
problem / exercise		
solving	0	0
Lab practices		0
Denomination of the	Evaluation systems	Marine mainting (9/)
Denomination of the	Minimum weighting (%)	Maximum weighting (%)
Development and	10	100
objective tests	10	100
nroblem solving and /		
or evercises (with		
nossibility of final		
exam)		
Practical tests (with	10	100
possibility of final		
exam)		
Evaluation of work	10	100
and activities		

UE49: Malware analysis

	Subject: Malware analysis
Course	
FCTS	6
Character	V Mandatory
Semester	6
I anguages in which it	Vietnamese
is taught	Victualitese
Basic and general	GC1: The ability to analyze systems mechanisms and procedures
competences	related to protection of information entities and objects
competences	GC2: Problem solving ability design ability
	GC3: Critical thinking
	GC4: Creativity and Reactivity
	GC5: Ability to apply theoretical knowledge to practice
	GC6: Ability for self-study
	GC8: Ability to project organization and planning
Specific competences	SC13: Skill in conducting vulnerability scans, recognizing and
	categorizing vulnerabilities in security systems.
	SC14: To understand and to apply the up-to-date methods, tools,
	software and techniques to analyze risks, threats and protect the
	system.
	SC15: The ability to understand security demands and design and
	implement software/hardware security solutions.
	SC17: The ability to know, understand and apply code analysis
	techniques.
	SC20: Skill in developing, testing, and implementing network
	infrastructure contingency and recovery plans.
	SC21: Skill in analysing and predicting trends in security aspects.
	SC22: Skill in analysing anomalous code as malicious or benign.
	SC23: The ability to know, understand and apply binary analysis
	techniques and tools.
	SC24. Skill in performing damage assessments.
Transversal	
Learning outcomes	Understanding of malware on computing devices
Learning outcomes	Understanding of defense measures
	Understanding of the factics techniques and procedures to
	analyze malware
	Ability to develop application to tackle challenges due to malware
Contents	M1. Introduction to malware
	M2: Static analysis
	M3: Dynamic analysis
	M4: Malware analysis on portable devices
Observations	
Teaching	Lecture, Demonstration, Problem solving, Show and tell. Work
methodologies (include	assignment, Laboratory experiment.
list)	
, , , , , , , , , , , , , , , , , , ,	Formation activities

Denomination of the formative activity	Hours	Presence (%)
Plenary session and problem / exercise solving	15	16.7%
Lab practices	15	16.7%
	Sistemas de evaluación	
Denomination of the evaluation system	Minimum weighting (%)	Maximum weighting (%)
Development and objective tests, problem solving and / or exercises (with possibility of final exam)	10	100
Practical tests (with possibility of final exam)	10	100
Evaluation of work and activities	10	100

UE50: Strategic Security Management

Subject: Strategic Security Management

Course			
ECTS	4		
Character	Mandatory		
~			
Semester	6		
Languages in which	Vietnamese		
it is taught			
Basic and general	- GC6: Ability for self-study		
competences			
Specific	- SC13: Skill in conducting vulneral	hility scans, recognizing and	
competences	categorizing vulnerabilities in secu	urity systems	
competences	- SC14: To understand and to apply	the up-to-date methods, tools.	
	software and techniques to analyze	e risks, threats and protect the	
	system.	risito, un cato and protect and	
	- SC16: Skill in determining how a	security system should work	
	(including its resilience and depen	dability capabilities) and how	
	changes in conditions, operations,	or the environment will affect these	
	outcomes.		
	- SC19: Skill in secure test plan des	ign (e. g. unit, integration, system,	
	acceptance).		
	- SC21: Skill in analysing and predi	cting trends in security aspects.	
	- SC27: To make employees aware	about corporate security policies and	
	standards		
	- SC28: To design, develop and report monitoring indicators according		
Transvorsal			
competences			
Learning outcomes	Introduces a number of national and international standards for		
Learning outcomes	information security and legal provisions on information security.		
	Introduces the process of identifying	and evaluating the safety risks of an	
	information system. Set policies to l	keep the system operating safely and	
	continuously.		
Contents	- M1: Introduction to Information Security Management System (ISMS)		
	- M2: Risk Assessment in Informati	on Security	
	- M3: Setting up risk control measur	res	
	- M4: Setting ISMS		
Observations			
Teaching	- Teaching theory		
methodologies	- Doing homework		
(include list)	- Discussion groups		
Donomination of	Formation activities	\mathbf{D} resonance $(0/\mathbf{)}$	
the formative	nours	r resence (70)	
activity			
Plenary session and	30	33.3%	
problem / exercise		0010/0	
solving			
Lab practices	0	0%	
	Sistemas de evaluación		
Denomination of	Minimum weighting (%)	Maximum weighting (%)	

the evaluation		
system		
Development and	10	100
objective tests,		
problem solving		
and / or exercises		
(with possibility of		
final exam)		
Practical tests (with	10	100
possibility of final		
exam)		
Evaluation of work	10	100
and activities		

UE51: Information System Security Audit

Subject: Information System Security Audit

Course			
ECTS	4		
Character	Mandatory		
Samestar	6		
I anguagos in which it is	Viotnamoso		
taught	vietnamese		
Basic and general	GC1: The ability to analyze systems, mechanisms and		
competences	procedures related to protect	ion of information entities and	
	objects		
	GC11: Skill in conducting tren	d analysis	
Specific competences	SC14: To understand and to apply the up-to-date methods,		
	tools, software and technique	es to analyze risks, threats and	
	protect the system.		
	SC15: The ability to understa	nd security demands and design	
	and implement software/hardw	vare security solutions	
Transversal competences			
Learning outcomes	Students can analysis risk	management approaches for	
	information system security a	udit corresponding to operation,	
	objectives of organizations		
	Students can evaluate logica	l, physical tests and automatic	
	approaches in Information Sys	tems Security	
Contents	M1: Overview of evaluate and	verify information safety.	
	M2: Information security risk	management	
	M3: ISO 27005 in information security assessment		
	M4: Operating system verification		
	M5: Network verification		
	M6: Information security testing tools		
Observations			
Teaching methodologies	Presenting on theory		
(include list)	Guiding classroom discussions		
	Formation activities		
Denomination of the	Hours	Presence (%)	
formative activity			
Plenary session and	22.5	25%	
problem / exercise solving		0.00/	
Lab practices	7.5 8.3%		
	Evaluation systems		
Denomination of the	Minimum weighting (%)	Maximum weighting (%)	
evaluation system	10	100	
Development and	10	100	
objective tests, problem			
solving and / or exercises			
(with possibility of final			
exam) Departicul tests ('th	10	100	
ractical tests (with	10	100	
Description	10	100	
Evaluation of work and	10	100	
activities			

UE52: Mobile Application Development

	Subject: Mobile Application Development		
Course			
FCTS	6		
Character	0 Ontional		
Somester	Optional		
I anguages in which it	Viotnamoso		
is tought	vietnamese		
Basic and general	GC3: Critical thinking		
competences	GC5: Ability to apply theoretical	knowledge to practice	
competences	GC6: Ability for self-study	knowledge to practice	
	GC7: Ability to work in a diverse	sity group and in an international	
	context (teamwork)	sty group and in an international	
	GC8: Ability to project organizat	ion and planning	
Specific competences	SC17: The ability to know, und	lerstand and apply code analysis	
~ F • • • • • • • • • F • • • • • • • •	techniques.		
	SC19: Skill in secure test plan	design (e. g. unit, integration,	
	system, acceptance)		
	SC31: The ability to know, under	stand and apply database security	
	techniques	11.5	
	SC32: The ability to know, under	stand and apply cloud computing	
	security solutions		
Transversal			
competences			
Learning outcomes	Understand the basic features of the Mobile programming		
	enviroment. Ability to compare the differences between Desktop		
	or Web Applications. Gains a deeper understanding of the issues		
	associated with developing mobilie apps. Analysis and design a		
	mobile application on object original	ented; Installing applications and	
	services on mobile devices; Know how to publish software		
C	applications for mobile devices.		
Contents	M1: Overview of Mobile App Development		
	M2: Developing the Android App		
Observations	M3: Developing the iOS App		
Tooching	Dresentations, Lab provides and Dreinste		
mothodologios (includo	riesentations, Lab practices and i	Tojects	
list)			
	Formation activities		
Denomination of the	Hours	Presence (%)	
formative activity			
Plenary session and	30	22.2%	
problem / exercise			
solving			
Lab practices	15	11.1%	
	Sistemas de evaluación		
Denomination of the	Minimum weighting (%)	Maximum weighting (%)	
evaluation system			
Development and	10	100	
objective tests,			
problem solving and /			

or exercises possibility of exam)	(with final		
Practical tests possibility of exam)	(with final	10	100
Evaluation of and activities	work	10	100

UE53 : Network security and operating systems

	Subject: Network security and operating systems
Course	

ECTS	4		
Character	Mandatory		
Semester	6		
Languages in which it is	Vietnamese		
taught			
Basic and general			
competences	GC1: The ability to analyze s	ystems, mechanisms and	
•	procedures related to protection	on of information entities and	
	objects		
	GC5: Ability to apply theoret	ical knowledge to practice	
	GC6: Ability for self-study		
	GC7: Ability to work in a div	ersity group and in an	
	international context (teamwo	ork)	
Specific competences	SC13. Skill in conducting vuln	erability scans, recognizing	
	and categorizing vulnerabilities in security systems.		
	SC14. To understand and to ap	ply the up-to-date methods,	
	tools, software and techniques	to analyze risks, threats and	
	protect the system.		
	SC15. The ability to understand	d security demands and design	
	and implement software/hardw	are security solutions	
	SC16. Skill in determining how	v a security system should	
	work (including its resilience a	nd dependability capabilities)	
	and how changes in conditions	, operations, or the	
	environment will affect these of	outcomes.	
	SC18. The ability to know, und	lerstand and apply security	
	event correlation techniques and tools.		
	SC19. Skill in secure test plan design (e. g. unit, integration,		
	system, acceptance).		
	SC21. Skill in analysing and p	redicting trends in security	
	aspects.		
	SC20. Skill in developing, testing, and implementing network		
	infrastructure contingency and	recovery plans.	
Transversal competences			
Learning outcomes	Introduces basic principles of	f network security and covers	
	topics such as active and passive attacks on the network,		
	encryption, symmetric and asymmetric key systems,		
	authentication by certification bodies. and access control		
	using passwords and firewalls.		
Contents	M1: Introduction to Network Security		
	M2: Threats to communication	s networks	
	M3: The role of encryption in a	network security M4: Perform	
	encryption in network		
M5: Authentication and access control		control	
Observations			
Teaching methodologies	- Teaching theory		
(include list)	- Doing homework		
	- Discussion groups		
	Formation activities		
Denomination of the	Hours	Presence (%)	
Iormative activity	20	22.29/	
Plenary session and	30	22.2%	
problem / exercise solving			

Lab practices	15	11.1%	
	Sistemas de evaluación		
Denomination of the	Minimum weighting (%)	Maximum weighting (%)	
evaluation system			
Development and objective	10	100	
tests, problem solving and /			
or exercises (with			
possibility of final exam)			
Practical tests (with	10	100	
possibility of final exam)			
Evaluation of work and	10	100	
activities			

UE54: Internship

	Subject: Internship
Course	

ECTS	24	
Character	Mandatory	
Semester		
Languages in which it	Vietnamese	
is taught		
Basic and general	GC5: Ability to apply theoretical knowledge to practice	
competences	GC7. Ability to work in a diversity group and in an international context	
-	(teamwork)	
	GC6. Ability for self-study	
	GC8. Ability to project organization and planning	
	GC9. Time management skill	
Specific competences	SC13. Skill in conducting vulnerability scans, recognizing and	
	categorizing vulnerabilities in security systems.	
	SC14. To understand and to apply the up-to-date methods, tools,	
	software and techniques to analyze risks, threats and protect the systems	
	SC15. The ability to understand security demands and design and	
	implement software/hardware security solutions	
	SC16. Skill in determining how a security system should work (including	
	its resilience and dependability capabilities) and how changes in	
	conditions, operations, or the environment will affect these outcomes.	
	SC17. The ability to know, understand and apply code analysis	
	techniques.	
	SC18. The ability to know, understand and apply security event	
	Correlation techniques and tools.	
	SC19. Skill in secure test plan design (e. g. unit, integration, system,	
	acceptance). SC20 Skill in developing testing and implementing network	
	infrastructure contingency and recovery plans	
	SC21 Skill in analysing and predicting trends in security aspect	
	SC22. Skill in analysing anomalous code as malicious or benig	
	SC22. The ability to know, understand and apply binary analysis	
	techniques and tools.	
	SC24. Skill in performing damage assessments.	
	SC25. Ability to evaluate risks (risk assessment)	
	SC26. To design/establish security policies, privacy policies and	
	standards	
	SC27. To make employees aware about corporate security policies and	
	standards	
	SC28. To design, develop and report monitoring indicators according to	
	policies and standards	
	SC29. Ability to describe and illustrate the risks, threats and solutions	
	SC30. Skill in technical writing, reviewing and editing cyber-related	
	Intelligence/assessment products from multiple sources.	
	SC31. The ability to know, understand and apply database security	
	econiques.	
	security solutions	
Transversal	security solutions.	
competences		
Learning outcomes		
	Students practice at computer company or lab. On successful completion	

of this course students will be able to:

	• Analysis and design system; evaluate common data models (databases); Explain the principles and techniques of programming, how a program is executed on the computer; Elaborate methods of designing algorithms and data structures to build computer software.
	• Apply knowledge of software development process, software architecture, database management system to software development.
	• Explain the basics of encryption; Evaluate some methods and tools for monitoring, ensuring system security. Apply knowledge of safety ensuring to the development of IT systems.
	• Effective communication; Presentation, group discussion, good coordination with members when joining the IT development team involved in many fields.
	• Programming proficiency in at least one programming language, using at least one database management system; Building, installing, operating the IT system.
	• Apply some scientific and technical tools to monitor, analyze and solve problems related to ensuring safety and security of information systems of computers and networks; Designing, building and deploying applications that ensure security and information security.
	• Perform ethics and professional responsibility, personal responsibility and responsibility for the group, compliance with occupational safety principles.
	• Self-orientated, adapt to different working environments; Being aware of the necessity of self-learning, accumulation of knowledge and experience to improve the professional level to meet the job requirements.
Contents	M1: Study overview of the problem and the company where interns are
	M2: Planning
	M3 : Requirements Discovery, Requirements analysis and Requirements Specification
	M4: Design Software/Find solutions to the Problem
	M5: Implementation M6: Software testing
Observations	
Teaching methodologies (include list)	Students study under the guidance and supervision of the lecturer
	Formation activities
Denomination of the	Hours Presence (%)

formative activity		
Plenary session and	0	0%
problem / exercise		
solving		
Lab practices	180	33.4%
	Sistemas de evaluació	ón
Denomination of the	Minimum weighting (%)	Maximum weighting (%)
evaluation system		
Development and	10	100
objective tests,		
problem solving and /		
or exercises (with		
possibility of final		
exam)		
Practical tests (with	10	100
possibility of final		
exam)		
Evaluation of work	10	100
and activities		

UE55: Web application security and testing

Subject: Web application security and testing

Course		
ECTS	6	
Character	Ontional	
Semester	1	
Languages in which it	Vietnamese	
is taught		
Basic and general	GC1. The ability to analyze sys	tems, mechanisms and
competences	procedures related to protection o	f information entities and objects
•	GC5. Ability to apply theoretica	al knowledge to practice
	GC6. Ability for self-study	8 I I
	GC7. Ability to work in a diver	sity group and in an international
	context (teamwork)	
	GC10. Representation skill: Abi	lity to represent, illustrate,
	convince	
Specific competences	SC13. Skill in conducting vulnera	bility scans, recognizing and
	categorizing vulnerabilities in sec	urity systems.
	SC14. To understand and to apply	the up-to-date methods, tools,
	software and techniques to analyz	e risks, threats and protect the
	system.	
	SC15. The ability to understand s	ecurity demands and design and
	implement software/hardware sec	urity solutions
	SC17. The ability to know, under	stand and apply code analysis
	techniques.	
	SC18. The ability to know, understand and apply security event	
	correlation techniques and tools.	
	SC19. Skill in secure test plan design (e. g. unit, integration,	
	system, acceptance).	
	SC25. Ability to evaluate risks (ri	sk assessment)
	SC29. Ability to describe and illu	strate the risks, threats and
	solutions	
	SC31. The ability to know, under	stand and apply database security
	techniques.	
Transversal		
competences		
Learning outcomes	Understand methods, techniques,	testing tools for web applications
	Understand web security, captures some common types of web	
	attacks and prevention method.	
	Ability of test planning, testcase v	vriting, testing and analysis of
	results.	
	Ability of using tools to support web vulnerabilities	
Contents	M1: Overview of web applications	
	M2: Common web application tes	ting methods
	M3: Some tools support web appl	ication testing
	M4: Web application security	
Observations		
Teaching	Presentations, Lab practices and I	rojects
methodologies (include		
list)		
	Formation activities	
Denomination of the	Hours	Presence (%)
tormative activity	20	
Plenary session and	30	22.2%

problem / exercise solving		
Lab practices	15	11.1%
	Sistemas de evaluación	
Denomination of the evaluation system	Minimum weighting (%)	Maximum weighting (%)
Development and objective tests, problem solving and / or exercises (with possibility of final exam)	10	100
Practical tests (with possibility of final exam)	10	100
Evaluation of work and activities	10	100

UE56: Computer network monitoring

	Computer network monitoring
Course	
ECTS	6

Character	Optional		
Semester	7		
Languages in which	Vietnamese	Vietnamese	
it is taught			
Basic and general	GC5. Ability to apply theoretical	knowledge to practice	
competences	GC6: Ability for self-study		
-			
Crosifia	CC12 Chill in conducting wh	anghility accurs managemining and	
specific	sciss. Skill ill collducting vul	ty systems	
competences	SC21 Skill in analysing and predicti	ng trands in socurity aspects	
	SC22. Skill in analysing and predict	and as malicious or banian	
Transversel	SC22. Skill in analysing anomalous (code as mancious or beingh.	
competences			
Learning outcomes	• Knowledge: Identification of th	reats and harms to the computer	
Learning outcomes	network monitoring methods and to	ole	
	• Technique: Use a number of comm	and line tools and graphical tools to	
	collect detect and analyze the risk to	the computer network	
	• Others: Cooperation in group: Wor	king independent or collaborative	
Contents	M1: Network Security Monitoring Ra	tionale	
	M2: Collecting Network Traffic: Acce	ess. Storage. and Management	
	M 3: Stand-alone NSM Deployment	and Installation	
	M4: Distributed Deployment		
	M5: OS Platform Housekeeping		
	M6: Command Line Packet Analysis	Tools	
	M7: Graphical Packet Analysis Tools		
	M8: NSM Consoles		
	M 9: NSM Operations		
	M 10: Server-side Compromise		
	M11: Client-side Compromise		
	M 12: Extending Security Onion		
	M 13: Proxies and Checksums		
Observations			
Teaching	- Teaching theory		
methodologies	- Doing homework		
(include list)	- Discussion groups		
	Formation activities		
Denomination of	Hours	Presence (%)	
the formative			
activity	20		
Plenary session and	30	22.2%	
problem / exercise			
solving	1.5	11.10/	
Lab practices		11.1%	
Demonstruction of	Sistemas de evaluacion		
Denomination of the avaluation	winimum weighting (%)	wiaximum weighting (%)	
system			
bystem Dovelopment and	10	100	
objective tests	10	100	
problem solving and			
or everging (with			
possibility of final			
possionity of final			

exam)		
Practical tests (with	10	100
possibility of final		
exam)		
Evaluation of work	10	100
and activities		

UE57: Graduation Thesis

	Subject: Graduation Thesis	
Course		
ECTS	20	
Character	Mandatory	
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Semester		
Languages in which it	Vietnamese	
is taught		
Basic and general	GC6. Ability for self-study	
competences	GC8. Ability to project organization and planning	
	GC9. Time management skill	
Specific competences	SC13. Skill in conducting vulnerability scans, recognizing and	
	categorizing vulnerabilities in security systems.	
	SC14. To understand and to apply the up-to-date methods, tools,	
	software and techniques to analyze risks, threats and protect the systems	
	SC15. The ability to understand security demands and design and	
	implement software/hardware security solutions	
	SC16. Skill in determining how a security system should work (including	
	its resilience and dependability capabilities) and how changes in	
	conditions, operations, or the environment will affect these outcomes.	
	SC17. The ability to know, understand and apply code analysis	
	techniques.	
	SC18. The ability to know, understand and apply security event	
	correlation techniques and tools.	
	SC19. Skill in secure test plan design (e. g. unit, integration, system,	
	acceptance).	
	SC20. Skill in developing, testing, and implementing network	
	infrastructure contingency and recovery plans.	
	SC21. Skill in analysing and predicting trends in security aspect	
	SC22. Skill in analysing anomalous code as malicious or benig	
	SC23. The ability to know, understand and apply binary analysis	
	techniques and tools.	
	SC24. Skill in performing damage assessments.	
	SC25. Ability to evaluate risks (risk assessment)	
	SC26. To design/establish security policies, privacy policies and	
	standards	
	SC27. To make employees aware about corporate security policies and	
	standards	
	SU28. 10 design, develop and report monitoring indicators according to	
	policies and standards	
	SC29. Addity to describe and industrate the fisks, threats and solutions	
	SUSU. Skill in technical writing, reviewing and editing cyber-related	
	Intelligence/assessment products from multiple sources. SC21 The ability to know understand and apply database security.	
	scs1. The ability to know, understand and apply database security	
	SC32 The ability to know understand and apply cloud computing	
	security solutions	
Transversal		
competences		
Learning outcomes	On successful completion of this course students will be able to:	
	• Analysis and design systems systems	
	• Analysis and design system; evaluate common data models	
	(databases); Explain the principles and techniques of programming,	
	how a program is executed on the computer; Elaborate methods of	

• Apply knowledge of software development process,					
architecture, database management system to software devel	software opment.				
• Explain the basics of encryption; Evaluate some methods for monitoring, ensuring system security. Apply knowledge ensuring to the development of IT systems.	and tools of safety				
• Programming proficiency in at least one programming using at least one database management system; Building, operating the IT system.	• Programming proficiency in at least one programming language, using at least one database management system; Building, installing, operating the IT system.				
 Apply some scientific and technical tools to monitor, and solve problems related to ensuring safety and security of in systems of computers and networks; Designing, buil deploying applications that ensure security and information 	• Apply some scientific and technical tools to monitor, analyze and solve problems related to ensuring safety and security of information systems of computers and networks; Designing, building and deploying applications that ensure security and information security.				
• Perform ethics and professional responsibility, personal resp and responsibility for the group, compliance with occupation principles.	• Perform ethics and professional responsibility, personal responsibility and responsibility for the group, compliance with occupational safety principles.				
• Self-orientated, adapt to different working environment aware of the necessity of self-learning, accumulation of k and experience to improve the professional level to meet requirements.	• Self-orientated, adapt to different working environments; Being aware of the necessity of self-learning, accumulation of knowledge and experience to improve the professional level to meet the job requirements.				
ContentsM1: Study overview of the problem M2: Planning M3 : Requirements Discovery, Requirements analysis and Requ Specification M4: Design Software/Find solutions to the Problem M5: Implementation M6: Software testing	 M1: Study overview of the problem M2: Planning M3 : Requirements Discovery, Requirements analysis and Requirements Specification M4: Design Software/Find solutions to the Problem M5: Implementation M6: Software testing 				
Observations					
Teaching methodologies (include Students study under the guidance and supervision of the lecture list) Students study under the guidance and supervision of the lecture	Students study under the guidance and supervision of the lecturer				
Formation activities					
Denomination of the formative activityHoursPresence (%)					
Plenary session and problem00%					
solving					
solving	Sistemas de evaluación				
solving Image: Solving Lab practices 150 Sistemas de evaluación					
solvingImage: solvingLab practices15033.3%Sistemas de evaluaciónDenomination of the winnum weighting (%)evaluation systemMaximum weighting (%)					
solvingImage: Constraint of the evaluation system15033.3%Development and 10Minimum weighting (%)					

or exercises possibility of exam)	(with final		
Practical tests possibility of exam)	(with final	10	100
Evaluation of and activities	work	10	100