

## COURSE SYLLABUS

(Training level: Undergraduate)

**Vietnamese Course Title:** Phân tích và quản lý yêu cầu phần mềm

**English Course Title:** Analysis and management of software requirements

**Course Code:** AMS431

**Major:** Software Engineering

**Training program:** Bachelor; Engineer.

### 1. General Information

- Number of credits: 03 (Theory: 03; Practice: 0)

- Types of Knowledge:

General Education		Basic core courses		Major core courses		Concentration courses		Others
Required <input type="checkbox"/>	Optional <input type="checkbox"/>					Software Engineering		
		Required <input type="checkbox"/>	Optional <input type="checkbox"/>	Required <input type="checkbox"/>	Optional <input type="checkbox"/>	Required <input checked="" type="checkbox"/>	Optional <input type="checkbox"/>	

- Pre-requisite: None

- Take the previous course: Introduction to Software Engineering

- Co-requisite: None

### 2. Time Allocated

Total: 54 Periods	Theory: 33 periods
	Discussion/ Group Presentation: 18/0
	Assignment/ Essay/ Practice: 0/0/0.
	Number of Tests: 3 Number of Theory Tests: 2    Periods: 02 Number of Report: 1    Periods: 01
	Self-Study: 105 hours Other Activities: 0 hours

**3. Departments in Charge:** Department of Software Engineering – Faculty Information Technology

### 4. Lecturer's Information

No.	Lecturer name	Phone number	Address	Note
1	MSc. Nguyen Hong Tan	0943252165	<a href="mailto:nhtan@ictu.edu.vn">nhtan@ictu.edu.vn</a>	Leader
2	MSc. Pham Thi Thuong	0912838646	<a href="mailto:ptthuong@ictu.edu.vn">ptthuong@ictu.edu.vn</a>	Member
3	MSc. Hoang Thi Canh	0382324556	<a href="mailto:htcanh@ictu.edu.vn">htcanh@ictu.edu.vn</a>	Member

**5. Facility Requirements:** Having a projector in the classroom.

## 6. Course Description:

The module provides students with the knowledge and skills to reason, organize, document, and track all requirements. Requirements management helps to verify and validate the software system, manage any changes so that the state of the system can be analyzed effectively, especially for large and complex software systems complex.

## 7. Objectives

Objectives	Description	PLOs	Competency Level
G1	Apply the necessary knowledge and techniques in gathering, analyzing, documenting, validating, and managing software requirements.	1.4	3
G2	Apply personal skills such as analytical reasoning and problem solving, systems thinking to practical problems	2.1	3
G3	Apply communication skills, teamwork and required engineering processes in the entire system development process to understand problems, propose solutions, design and implement responsive systems. initial requirements	3.1, 3.2 4.1, 4.2	3

## 8. Learning Outcomes

Objectives	CLOs	Description of CLOs	PLOs	Proficiency level
G1	G1.1	Apply different types of requirements to different types of systems	1.4	3
	G1.2	Apply the steps in the requirements engineering process including business requirements gathering, requirements analysis and specification, requirements validation and management	1.4	3
	G1.3	Apply methods and techniques to collect requirements	1.4	3
G2	G2.1	Apply systems-level thinking to identify, provide solutions, and evaluate options for solving problems of a particular system.	2.1	3
	G2.2	Apply personal skills such as analytical reasoning and problem solving to practical problems	2.1	3
G3	G3.1	Apply teamwork skills to understand requirements documents and perform activities in the requirements engineering process	3.1	3
	G3.2	Apply communication skills in presenting ideas and presentations to present solutions to customers	3.2	3
	G3.3	Applying current survey methods to survey the current conditions to be surveyed for a specific project	4.1	3
	G3.4	Apply knowledge to identify system requirements to build and model these requirements	4.2	3
	G3.5	Apply techniques and tools to support requirements specification, analysis, and management	4.2	3

## 9. Scientific Ethics

Actively attend theoretical classes in class, do exercises assigned by the lecturer, fully participate in discussion hours in the spirit of improving self-discipline, self-control and completing regular tests. All acts of cheating in learning and assessment will be according to regulations.

## 10. Detailed Contents

Period	Contents	References	CLOs	Competency Level	Teaching Methodology	Assessment Methodology
1, 2, 3	<b>Chapter 1: Requirements Industry Overview</b>					
	<b>A/ Content of classroom learning: (3)</b> - <b>Content of theoretical education</b> 1.1. The importance of the request 1.2 Requirement concept	[1] [2] [3] [4]	G1.1 G1.2	3 3	Present; Raise and solve problems	Judging by comments; diligence
	<b>B/ The contents to be self-study at home: (6)</b> Learn the classifications of software requirements	[1] [2]	G1.1 G1.2	3 3	Guided self-study	
4, 5, 6	<b>Chapter 1: Requirements Industry Overview (Continued)</b>					
	<b>A/ Content of classroom learning: (3)</b> - <b>Content of theoretical education</b> 1.3 Technical requirements 1.4 Requirements from the customer's point of view 1.5 Essential skills for systems analyst	[first] [2] [3] [4]	G1.1 G1.2	3 3	Present; Raise and solve problems	Judging by comments; diligence
	<b>B/ Contents to be self-study at home: (6)</b> Learn the required engineering process	[1] [2]	G1.1 G1.2	3 3	Guided self-study	Motivational assessment/ Combined with due diligence
7, 8, 9	<b>Chapter 2. Software Requirements Development-Defining Project Vision and Scope</b>					
	<b>A/ Content of classroom learning: (3)</b> 2.1 Defining the project scope 2.2 Define the product vision	[1] [2] [7]	G1.3 G3.3 G3.4	3 3 3	Present	Direct exchange
	<b>B/ Contents to be self-study at home: (6)</b> Study the sample form of the Vision document and the Scope document of the project	[1] [2] [7]	G1.3 G3.1 G3.2 G3.3	3 3 3 3	Guided self-study	Motivational assessment/ Combined with due diligence
10, 11, 12	<b>Discussion 1. Requirements classification and software requirements engineering process</b>					
	<b>A/ Content of classroom learning: (3)</b> - <b>Content of theoretical education</b> Discuss the contents of chapter 1 and chapter 2	[1] [2] [3] [4] [5]	G3.1 G3.2 G3.3	3 3 3	The groups present and discuss according to the plan under the supervision of the lecturer	Judging by comments; Q&A

	<b>B/ Contents to be self-study at home: (6)</b> Chapter 1 and 2	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2	3 3 3 3	Guided self-study	Motivational assessment/ Combined with due diligence
13, 14, 15	<b>Chapter 3. Collecting Requests</b>					
	<b>A/ Content of classroom learning: (3)</b> 3.1 Origin of request types 3.2 Analysis and identification of stakeholders	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.3 G3.4	3 3 3 3	Present; Raise and solve problems;	Judging by comments; check, evaluate the process
	<b>B/ Contents to be self-study at home: (6)</b> Students need to learn about business analysis (BA) of the system	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2 G3.3 G3.4	3 3 3 3 3 3	Guided self-study	Motivational assessment/ Combined with due diligence
16, 17, 18	<b>Chapter 3. Requirements gathering (Continued)</b>					
	<b>A/ Content of classroom learning: (3)</b> 3.3 Requirements gathering techniques 3.4 Classification of requested information Periodic Test No.1	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.4	3 3 3	Present; Raise and solve problems; Operate directly on the projector	Judging by comments and scores
	<b>B/ Contents to be self-study at home: (6)</b> Required archiving techniques and tools	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2 G3.4	3 3 3 3 3	Guided self-study	Motivational assessment/ Combined with due diligence
19, 20, 21	<b>Discussion 2. Requirements gathering techniques</b>					
	<b>A/ Content of classroom learning: (3)</b> - Discuss the content of chapter 3	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2	3 3 3 3	The groups present and discuss according to the plan under the supervision of the lecturer	Judging by comments; Q&A
	<b>B/ The contents to be self-study at home: (6)</b> Requirements gathering techniques	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2	3 3 3 3	Guided self-study	Motivational assessment/ Combined with due diligence
22, 23, 24	<b>Chapter 4. Requirements Analysis</b>					
	<b>A/ Content of classroom learning: (3)</b> 4.1 Concepts 4.2 Purpose of requirements analysis 4.3 Requirements Analysis Activity	[1] [2] [3] [4] [5]	G1.3 G3.3 G3.4 G3.5	3 3 3 3	Present; Raise and solve problems	Judging by comments; diligence
	<b>B/ Contents to be self-study at home: (6)</b> System models	[1] [2] [3] [4] [5]	G1.3 G3.3 G3.4 G3.5	3 3 3 3	Guided self-study	Motivational assessment/ Combined with due diligence

25, 26, 27	<b>Chapter 4. Requirements Analysis</b> ( <i>continued</i> )					
	<b>A/ Content of classroom learning: (3)</b> 4.4 Principles of analysis 4.5 Systems requirements analysis models	[1] [2] [3] [4] [5]	G1.3 G3.3 G3.4 G3.5	3 3 3 3	Present; Raise and solve problems; Direct operation on the projector	Rate by comment
28, 29, 30	<b>B/ Contents to be self-study at home: (6)</b> System Models	[1] [2] [3] [4] [5]	G1.3 G3.3 G3.4 G3.5	3 3 3 3	Guided self-study	Motivational assessment/ Combined with due diligence
	<b>Discussion 3. System Models</b>					
28, 29, 30	<b>A/ Content of classroom learning: (3)</b> - Discuss the content of chapter 4 on models and principles of analysis	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2 G3.3 G3.4	3 3 3 3 3 3	The groups present and discuss according to the plan under the supervision of the lecturer	Judging by comments; Q&A
	<b>B/ Contents to be self-study at home: (6)</b> • Systems analysis models	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2 G3.3 G3.4	3 3 3 3 3 3	Guided self-study	Motivational assessment/ Combined with due diligence
31, 32, 33	<b>Chapter 5. Requirements Specification</b>					
	<b>A/ Content of classroom learning: (3)</b> - Content of theoretical education 5.1 Concept of specification 5.2 Specification techniques 5.3 Data dictionary <b>Periodic Test No.2</b>	[1] [2] [3] [4] [7]	G1.3 G3.4 G3.5	3 3 3	Present; Raise and solve problems; Operate directly on the projector	Judging by comments and scores
34, 35, 36	<b>B/ Contents to be self-study at home: (6)</b> Software specification methods	[1] [2] [3] [4] [7]	G1.3 G3.4 G3.5	3 3 3	Guided self-study	Motivational assessment/ Combined with due diligence
	<b>Discussion 4. Requirements specification technique</b>					
34, 35, 36	<b>A/ Content of classroom learning: (3)</b> - Discuss the content of chapter 5 on formal and informal specification methods	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2 G3.5	3 3 3 3 3	The groups present and discuss according to the plan under the supervision of the lecturer	Judging by comments; Q&A
	<b>B/ The contents to be self-study at home: (6)</b> Software specification techniques	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2	3 3 3 3	Guided self-study	Motivational assessment/ Combined with due diligence

	<b>Chapter 6. Requirements validation, management and improvement</b>								
37, 38, 39	<b>A/ Content of classroom learning: (3)</b> 6.1 Verification of requirements 6.2 Requirements management & requirements evolution	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2 G3.3	3 3 3 3 3	Present; Raise and solve problems; instructions for direct operation on the projector;	Judging by comments; check, evaluate the process			
	<b>B/ Contents to be self-study at home: (6)</b> • Required quality standards Requirements change management process	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2	3 3 3 3			Guided self-study	Motivational assessment/ Combined with due diligence	
	<b>Chapter 6. Requirements validation, management and improvement (continued)</b>								
	40, 41, 42	<b>A/ Content of classroom learning: (3)</b> 6.3 Process improvement requirements	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2			3 3 3 3	Present; Raise and solve problems; Operate directly on the projector.	Judging by comments; process check.
		<b>B/ Contents to be self-study at home: (6)</b> Process improvement requirements	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2			3 3 3 3		
<b>Discussion 5. Requirements management and improvement process</b>									
43, 44, 45		<b>A/ Content of classroom learning: (3)</b> <b>- Contents of GD:</b> Discuss the content of chapter 6 on the requirements management and improvement process	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2 G3.3 G3.4 G3.5	3 3 3 3 3 3	The groups present and discuss according to the plan under the supervision of the lecturer	Judging by comments; Q&A		
		<b>B/ The contents to be self-study at home: (6)</b> - Completing group reports	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2 G3.3 G3.4 G3.5	3 3 3 3 3 3				
	<b>Chapter 7 Some advanced topics</b>								
	46, 47, 48	<b>A/ Content of classroom learning: (3)</b> <b>- Content of theoretical education</b> 7.1 Required technology in RUP . approach 7.2 Technology required in Agile approach	[1] [2] [3] [4] [5] [6]	G2.1 G2.2 G3.1 G3.2 G3.3 G3.4 G3.5	3 3 3 3 3 3			Present; Raise and solve problems; Operate directly on the projector.	Judging by comments; process check.

	<b>B/ Contents to be self-study at home: (6)</b> Flexible process RUP Process	[1] [2] [3] [4] [5] [6]	G2.1 G2.2 G3.1 G3.2	3 3 3 3	Guided self-study	Motivational assessment/ Combined with due diligence
49, 50, 51	<b>Chapter 7 Some advanced topics (continued)</b>					
	<b>A/ Content of classroom learning: (3)</b> 7.3 Real-time and embedded system requirements engineering 7.4 Several requirements management tools <b>Periodic Test No.3</b>	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2 G3.3 G3.5 G3.5	3 3 3 3 3 3 3	Present; Raise and solve problems; instructions for direct operation on the projector; count.	Judging by comments; process assessment and scores.
	<b>B/ The contents to be self-study at home: (6)</b> • Tools Like Rational Requisite Pro	[1] [2] [3] [4] [5]	G2.1 G2.2 G3.1 G3.2 G3.3 G3.4 G3.5	3 3 3 3 3 3 3	Guided self-study	Motivational assessment/ Combined with due diligence
52, 53, 54	<b>Discussion 6. Software requirements management tools</b>					
	<b>A/ Content of classroom learning: (3)</b> Discuss the content of chapter 7 on software requirements management tools	[1] [2] [7]	G1.2 G2.1 G2.2 G3.1 G3.2 G3.3	3 3 3 3 3 3	The groups present and discuss according to the plan under the supervision of the lecturer	Judging by comments; Q&A
	<b>B/ The contents to be self-study at home: (6)</b> Software requirements management tools	[1] [2] [7]	G2.1 G2.2 G3.1 G3.2	3 3 3 3	Guided self-study	Motivational assessment/ Combined with due diligence

## 11. Student Assessment: Score Scale: 10.

### 11.1. Test Plan:

No.	Contents	Time (Period)	CLOs	Proficiency level	Assessment methods	Assessment Tool	Weight %
<b>Attendance</b>							<b>10</b>
<b>Progress tests</b>							<b>30</b>
1	Chapter 2+3	18	G1.1 G1.2 G1.3 G2.1 G2.2	3 3 3 3 3	Written	Periodic Test No. 1	10
2	Chapter 4+5	33	G3.3 G3.4 G3.5	3 3 3	Written	Periodic Test No. 2	10

3	Chapter 6+7	51	G1.1 G1.2 G1.3 G2.1 G2.2 G3.1 G3.2	3 3 3 3 3 3 3	Group presentations	Periodic Test No. 3	10
<b>Final Examination</b>							<b>60</b>
	Chapter 2-7		G1.1 G1.2 G1.3 G2.1 G2.2 G3.1 G3.2 G3.3 G3.4 G3.5	3 3 3 3 3 3 3 3 3 3	Report	Final Examination	60

CLOs	Contents						Test Method			
	Periods 1-6	Periods 7-15	Periods 6-24	Periods 25-36	Periods 37-45	Periods 46-54	Written assessment I	Written assessment II	Report Assessment III	End of Course exam
G1.1	x	x	x	x	x	x	x		x	x
G1.2	x	x	x	x	x	x	x		x	x
G1.3		x		x	x	x	x		x	x
G2.1		x	x			x	x		x	x
G2.2		x		x		x	x		x	x
G3.1		x	x	x	x	x			x	x
G3.2		x	x	x	x	x			x	x
G3.3		x		x	x	x		x		x
G3.4		x		x	x			x		x
G3.5			x	x	x			x		x

## 11.2 Assessment Rubrics

### \* Rubric 1: Attendance

Criteria assessment	Weight (%)	Very good (8.5-10)	Good (7.0-8.4)	Average (5.5-6.9)	Below average (4.0-5.4)	Poor (0-3.9)
Full participation in classes	70	Full class attendance	Absence from 1-9%	Absence from 10-15%	Absence from 16-20%	Absence from 20% (banned from exams)



Criteria assessment	Weight (%)	Very good (8.5-10)	Good (7.0-8.4)	Average (5.5-6.9)	Below average (4.0-5.4)	Poor (0-3.9)
Activeness in lessons, self-study	30	Participate in questions, discussions very actively, Complete all the assignments	Participate in asking questions, discussion, doing exercises quite actively	Participate in asking questions, discussions, and doing exercises less actively.	Participate in asking questions, discussions, doing exercises with teachers' help.	Only take part in class, but not participate in asking questions, discussions, doing exercises in active ways.

**\* Rubric 2: Periodic Test No.1** (Allotted time: 50 minutes; Form: written; Total of Questions: 02; Score Scale: 10)

Evaluation criteria		Weight (%)	Quality Level Description				
Question	CLOs		Very good	Good	Average	Below average	Poor
			(8,5-10 point)	(7,0-8,4 point)	(5,5-6,9 point)	(4,0-5,4 point)	(0-3.9 point)
1	G1.1 G1.2 G1.3	50	Beautiful and clear presentation. Content that solves 90-100% of the requirements	Clearly presented. Content that addresses 70 to less than 90% of the requirements	The presentation is relatively clear. Content that addresses between 50 and less than 70% of the requirements	The presentation is not clear. Content that addresses between 40 and less than 50% of the requirements	The presentation is not clear. Content that resolves less than 40% of the requirements
2	G2.1 G2.2	50	Beautiful and clear presentation. Content that solves 90-100% of the requirements	Clearly presented. Content that addresses 70 to less than 90% of the requirements	The presentation is relatively clear. Content that addresses between 50 and less than 70% of the requirements	The presentation is not clear. Content that addresses between 40 and less than 50% of the requirements	The presentation is not clear. Content that resolves less than 40% of the requirements

**\* Rubric 3: Periodic Test No.2** (Allotted time: 50 minutes; Form: written; Total of Questions: 02; Score Scale: 10)

Evaluation criteria		Weight (%)	Quality Level Description				
Question	CLOs		Very good	Good	Average	Below average	Poor
			(8,5-10 point)	(7,0-8,4 point)	(5,5-6,9 point)	(4,0-5,4 point)	(0-3.9 point)
1	G3.3	40	Nice and clear presentation. Content solves 90-100% of the requirements well	Clear presentation. Content that solves 70 to less than 90% of requests	Pretty clear presentation. Content solves from 50 to less than 70% of the requirements set	The presentation is not clear. Content that solves from 40 to less than 50% of the requirements set	The presentation is not clear. Content that solves less than 40% of requests
2	G3.4 G3.5	60	Nice and clear presentation. Content solves 90-100% of the requirements well	Clear presentation. Content that solves 70 to less than 90% of requests	Pretty clear presentation. Content solves from 50 to less than 70% of the requirements set	The presentation is not clear. Content that solves from 40 to less than 50% of the requirements set	The presentation is not clear. Content that solves less than 40% of requests

**\* Rubric 4: Periodic Test No.3** (Allotted time: 50 minutes; Form: Reporting; Score Scale: 10)

Evaluation criteria		Weight (%)	Quality Level Description				
Criteria	CLOs		Very good	Good	Average	Below average	Poor
			(8,5-10 point)	(7,0-8,4 point)	(5,5-6,9 point)	(4,0-5,4 point)	(0-3.9 point)
Form report	G3.1 G3.2	10	Beautiful, clear, no error Spell	Beautiful, clear, still less than 10 misspellings	Beautiful, clear, still 11 -20 spelling mistakes	Not beautiful, clear, still over 20 Spell	Not pretty, not clear, minuscule, a lot of errors Spell
Content report	G1.1 G1.2 G1.3 G2.1 G2.2	40	Meet 90-100% of the request, yes expand, yes quoting references	Response 80-90% request, yes expanded, citing incomplete references	Satisfied 70-80% enough love bridge	Meet 50-60% of requests bridge	Answer less than 50% of the request
Skill present	G3.1 G3.2	10	Make it clear, self believe, theory serve, deliver save people listen well	Make it clear, self trust, exchange listener	Clarify, little communication listener	Wordless, unconfident, little communication listener	Whisper, not confident, no delivery save people to listen
Answer ask	G1.1 G1.2 G1.3 G2.1 G2.2	20	Right answer all of question	Right answer over 2/3 sentences ask	Right answer over 1/2 sentence ask	Right answer over 1/3 of sentences ask	Right answer less than 1/3 of sentences ask
Participation perform	G3.1 G3.2	20	100% finished member real family show/submit display	~80% member participation real show/submit display	~60% member participation real show/submit display	50% member participation real show/submit display	less than 50% member participation real show/submit display

**\* Rubric 5: Final Examination** (Form: Reporting; Score Scale: 10)

Evaluation criteria		Weight (%)	Quality Level Description				
Criteria	CLOs		Very good	Good	Average	Below average	Poor
			(8,5-10 point)	(7,0-8,4 point)	(5,5-6,9 point)	(4,0-5,4 point)	(0-3.9 point)
Form report	G3.1 G3.2	10	Beautiful, clear, no error Spell	Beautiful, clear, still less than 10 misspellings	Beautiful, clear, still 11 -20 spelling mistakes	Not beautiful, clear, still over 20 Spell	Not pretty, not clear, minuscule, a lot of errors Spell
Content report	G1.1 G1.2 G1.3 G3.3 G3.4 G3.5	40	Meet 90-100% of the request, yes expand, yes quoting references	Response 80-90% request, yes expanded, citing incomplete references	Satisfied 70-80% enough love bridge	Meet 50-60% of requests bridge	Answer less than 50% of the request
Skill present	G3.1 G3.2	10	Make it clear, self believe, theory serve, deliver save people listen well	Make it clear, self trust, exchange listener	Clarify, little communication listener	Wordless, unconfident, little communication listener	Whisper, not confident, no delivery save people to listen

Evaluation criteria		Weight (%)	Quality Level Description				
Criteria	CLOs		Very good	Good	Average	Below average	Poor
			(8,5-10 point)	(7,0-8,4 point)	(5,5-6,9 point)	(4,0-5,4 point)	(0-3,9 point)
Answer ask	G2.1 G2.2 G3.3 G3.4 G3.5	20	Right answer all of question	Right answer over 2/3 sentences ask	Right answer over 1/2 sentence ask	Right answer over 1/3 of sentences ask	Right answer less than 1/3 of sentences ask
Participation perform	G2.1 G2.2 G3.1 G3.2	20	100% finished member real family show/submit display	~80% member participation real show/submit display	~60% member participation real show/submit display	50% member participation real show/submit display	less than 50% member participation real show/submit display

## 12. Study materials

### A. Main Syllabus

[1] *Lecture on Requirements Analysis and Management*, Department of Software Engineering, Faculty of Information Technology, University of Information and Communication Technology, Thai Nguyen University.

### B. References

[2] Peter Zielczynski, *Requirements Management Using IBM Rational RequisitePro*. IBM Press, ISBN: 0-321-38300-1, 2008.

[3] Ian Sommerville's, "*Software Engineer*"; 7th Ed., Addison-Wesley; 2005.

[4] Hull, Elizabeth Jason, and Jeremy Dick, *Requirements Engineer*, London: Spiner, 2005.

[5] Axel van Lamsweerde, *Requirement Engineering: From System goals to UML models to Software specifications*, Weley, 2009.

[6] Brian Berenbach, Daniel J. Paulish, Juergen Kazmeier, Arnold Rudorfer, *Software & Systems Requirements Engineer: In Practice*, McGraw Hill, 2009

[7] Dean Leffingwell, Don Widrig, *Managing software requirements: A Unified process*, Wesley, 1999

**13. 1st Approval Date:** September 5<sup>th</sup>, 2021

**14. Competent Authority Approval:** Thai Nguyen University of Information and Communication Technology

Vice Rector



Ph.D Do Dinh Cuong

Dean



Ph.D Nguyen Hai Minh

Head of Department



MSc. Nguyen Hong Tan

Composer Team

Hoang Thi Canh



Nguyen Hong Tan



Pham Thi Thuong

