



VIETNAM NATIONAL UNIVERSITY OF HO CHI MINH CITY
UNIVERSITY OF NATURAL SCIENCES
FACULTY OF INFORMATION TECHNOLOGY

COURSE SYLLABUS

Course Code:	TH301
Title:	Formal Specification
Credits:	5
Workload:	Lecture hours: 4 periods * 15 weeks = 60 periods Laboratory hours: 2 periods * 15 weeks = 30 periods Preparative hours: 3 periods * 15 weeks = 45 periods
Prerequisites:	TH110 - Introduction to Software Engineering Discrete Mathematics

Course Objectives:

The course provides the fundamentals on which Software Engineering and, more generally, Computer Science exploit to present ideas and results of research. It aims to provide students with an approach for software development by formal specification. It includes general-knowledge chapters on set, sequence, function, etc, and more specific chapters on Z and VDM languages.

Main Text: N/A

References:

- *An Introduction to Formal Specification with Z and VDM*
Deri Sheppard._ The McGraw-Hill International,1994._398 tr.;20,5 cm.
- *The Construction of Formal Specification*
J.G Turner,T.L McCluskey._The McGraw-Hill International,1994._420 tr.;20,5 cm
- *VDM une Méthode Rigoureuse pour le Développement du logiciel*
Cliff B. Jones._Maison Paris,1993._290 tr.;20,5 cm.

Course Outline:

Chapter 1 : Overview (8 periods)

1. Basic concepts
 1. Specification
 2. Formal specification
 3. Formal language
2. Software development by formal specification
 1. Specification in analysis
 2. Specification in design
 3. Specification in testing
3. Formal specification languages
 1. Mathematical language

2. VDM
3. Z language
4. Diagram

Chapter 2 : Fundamental components in formal specification (16 periods)

1. Logic
 1. Logic clauses
 2. Logic predicates
2. Sets
 1. Operators
 2. Products of sets
3. Relations and functions
 1. Relations
 2. Functions
4. Sequences
 1. Sequences
5. Recursive specification
 1. Introduction
 2. Specification

Chapter 3 : Specification with VDM (20 periods)

1. Introduction
 1. Objects in VDM
 2. Specification structures in VDM
 3. Proof
2. Sets in VDM
 1. Set type
 2. Operators
3. Functions in VDM
 1. Function type
 2. Operators
 3. Proof
4. Sequences in VDM
 1. Sequences
5. States in VDM
 1. Definition of state
 2. Hidden operators
 3. Non-hidden operators

Chapter 4 : Specification with Z (16 periods)

1. Introduction
 1. Data types in Z
 2. Specification structures in Z
 3. Notations
2. Z diagram
 1. Basic concepts
 2. Diagrams integration

3. Diagrams and data types
3. Operators on diagrams
 1. Operators
 2. General diagrams

Grading

Final exam :

Assignments: