COURSE SYLLABUS

I. GENERAL INFORMATION

1. Course title in Vietnamese: **CÔNG CỤ THIẾT KẾ HỆ THỐNG THÔNG TIN**

2. Course title in English: **INFORMATION SYSTEM DESIGN TOOLS**

3. Knowledge / skill categorization:

☐ General knowledge   ☐ Specialized knowledge

☒ Basic knowledge   ☐ Supplementary knowledge

☐ Professional knowledge   ☐ Graduate project / thesis

4. Number of credits

Total	Theory	Practice	Self-study
3	2	1	3 (2,1,5)

5. In charge of course

a) Faculty / Department / Sub-Department: Information Technology

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II. COURSE INFORMATION

1. Course description

The course offers students the reinforcement and development of skills in analysis, design, and development of information systems in whole or in part. Specifically, students approach to analyze, design, and deploy e information systems with modern tools (such as Power Designer). In addition, the skills of analyzing and designing a relational database (database) based on an entity model using SQL language to query data are also developed. Thereby, students present concepts about software technology and software production process, particularly in software analysis, design and construction.

In addition, the course creates an environment for students to practice their sense of responsibility and professional ethics: honesty, prestige, professional manners and awareness of the importance and ability to fulfill their responsibilities, people, community, and country.

2. Course conditions

#	Course conditions	Course code
1.	Prerequisites	
	None	
2.	Previous courses	
	System Design Analysis	ITEC3401
3.	Parallel courses	
	None	

3. Course objectives (COs)

The course will provide students with ability to:

Course objectives (CO)	Description	Related Program Learning Outcomes (PLO)
O1	- Analyze, design and build part or all of the information system	PLO4.7
O2	- Analyze, design and deploy management information systems using modern tools (such as Power Designer)	PLO5.3
O3	- Present the concepts of software technology and software manufacturing process	PLO6.5
O4	- Analyze and design a relational database (database) based on the association entity model.	PLO4.4
O5	- Develop the ability to work in teams with an independent, creative, professional and responsible mindset	PLO1.3

4. Course learning outcomes (CLOs)

After completing this course, students are able to:

Course goals	Course output standard	Description of course output standards

O1 O2	CLO 1.1 Analysis of an information system	Analyze a description of the current state of an information system: functional decomposition chart and business process diagram.
	CLO 1.2 Design of data and functionality for an information system	Design data flow charts and data models for an information system
O3	CLO 2. Apply theoretical knowledge to analyze and design a system using support tools	Proficient use of PowerDesigner tools in analyzing and designing an information system: BPM, CDM, PDM, OOM and XSM models.
O4	CLO 3. Presenting concepts in software development	Understand the processes of surveying, analyzing, designing, and building information systems and the role of the titles in a software development team.
O5	CLO 4. Use relational data model theories to solve a problem	Build relational database design models for an information system and physically link to a database management system with SQL queries.
O1	CLO 5. Develops the ability to work in groups to handle an information system problem	Promote the ability to understand, analyze and design information systems to complete small projects with the team to solve the problem of developing a management information system

Matrix of Course Learning Outcomes (CLOs) and Program Learning Outcomes (PLOs):

CLOs	PLO 4.4	PLO 4.7	PLO 5.3	PLO 6.5	PLO 13
CLO 1.1	3	5	3	3	2
CLO 1.2	3	5	3	3	2
CLO 2	3	3	5	3	2
CLO 3	3	3	3	5	2
CLO 4	5	3	3	3	5
CLO 5	3	3	3	3	5

1: Not supported   *4: Highly supported*
2: Partially supported   *5: Totally supported*
3: Supported

5. Course materials
a) *Textbooks*

[1] S. George, G. McGeachie. Data Modeling Made Simple with Power Designer (Take It with You). First edition, Technics Publications, 2011.

b) *Reference materials*

[1] B. Dathan, S. Ramnath. Object-Oriented Analysis, Design and Implementation: An Integrated Approach (Undergraduate Topics in Computer Science). The second Edition, Springer, 2015

a) *Software*

Sybase (2012/16.5). PowerDesigner.

6. Course assessment

Components	Assessment	Timing	Course learning outcomes (CLO)	Rate (%)
(1)	(2)	(3)	(4)	
A1. Midterm review (score scale)			CLO1.1, CLO1.2, CLO 2, CLO3, CLO4, CLO5	50%
A1.1Class assignments and attendance	Exercise chapters 1 to 6 Class attendance	30min – 45min.	CLO1.1, CLO1.2, CLO2, CLO3, CLO4	10%
A1.2Small project exercise	Group project exercises		CLO1.1, CLO1.2, CLO2, CLO3, CLO4, CLO5	20%
A1.3 Practical exercises on the computer	Practice on Power Designer system: 5 lessons	4.5 hours/lesson	CLO1.1, CLO1.2, CLO2, CLO4	20%
A2. Final term review	Practice test	120 min.	CLO1.1, CLO1.2, CLO, CLO3, CLO4, CLO5	50%
Total				100%

7. Rubrics review

a) Rubric for small project (Group project exercises - 50%)

Criterion	CLO	Weight	Expert /Excellent	Solid/ Good	Basic/ Satisfactory	Poor /Unsatisfactory
Quality of response		**100% (10 marks)**	**Mark/Criteria**			
Content	**1,2,3,4,5**	30%	The essay illustrates exemplary understanding of the course material by thoroughly and correctly: (1) addressing the relevant content; (2) identifying and explaining all of the key concepts/ideas; (3) using correct terminology; (4) explaining the reasoning behind key points/claims; and (5) (where necessary or	The essay illustrates solid understanding of the course material by correctly: (1) addressing most of the relevant content; (2) identifying and explaining most of the key concepts/ideas; (3) using correct terminology; (4) explaining the reasoning behind most of the key points/claims; and (5) (where necessary or	The essay illustrates rudimentary understanding of the course material by: (1) mentioning, but not fully explaining, the relevant content; (2) identifying some of the key concepts/ideas (though failing to fully or accurately explain many of them); (3) using terminology, though sometimes inaccurately or inappropriately; and (4)	The essay illustrates poor understanding of the course material by (1) failing to address or incorrectly addressing the relevant content; (2) failing to identify or inaccurately explaining/defining key concepts/ideas; (3) ignoring or incorrectly explaining key points/claims and the reasoning behind them; and (4) incorrectly or

			useful) substantiating points with several accurate and original examples.	useful) substantiating some points with accurate examples.	incorporating some key claims/points, but failing to explain the reasoning behind them (or doing so inaccurately).	inappropriately using terminology.
Reasoning		30%	The essay reflects expert reasoning by: (1) synthesizing material; (2) making connections between relevant ideas/claims/points; (3) presenting an insightful and thorough evaluation of the relevant issue or problem; (4) identifying and discussing important nuances in the relevant material; and (5) identifying and discussing key	The essay reflects fairly strong reasoning by: (1) synthesizing material, (2) making appropriate connections between some of the key ideas/claims/points; (3) accurately evaluating the issue/problem; and (4) identifying and discussing key assumptions and/or implications.	The essay reflects basic reasoning by: (1) synthesizing some of the material, though remains vague and undeveloped; (2) making a few connections between ideas/claims/points, but ignoring or inaccurately connecting others; (3) evaluating the issue/problem at a very basic/superficial level; and (4) ignoring	The essay reflects substandard or poor reasoning by: (1) failing to synthesize the material or doing so inaccurately; (2) failing to make connections between ideas/claims/points or doing so inaccurately; and (3) failing to evaluate the issue or problem.

			assumptions and/or implications.		assumptions and implications.	
Use of sources		20%	Sources are used to give compelling evidence to support claims and are clearly and fairly represented. APA or MLA format is used accurately and consistently.	Sources are used effectively to support claims and are, for the most part, clear and fairly represented. APA or MLA format may be used with a few minor errors.	Although references to Sources are occasionally given, many statements seem unsubstantiated. There are frequent errors in APA or MLA format leaving the reader confused about the source of information and ideas.	Sources are seldom cited to support statements and/or format of the document is not recognizable as either MLA or APA format.
Writing		20%	The essay is clear, and concise as a result of: (1) appropriate and precise use of terminology; (2) absence of tangents and coherence of thoughts; and (3) logical	The essay is mostly clear as a result of: (1) appropriate use of terminology and minimal vagueness; (2) minimal number of tangents and lack of repetition; and (3) fairly good organization	The essay is often unclear and difficult to follow due to: (1) some inappropriate terminology and/or vague language; (2) ideas sometimes being fragmented, wandering	The essay does not communicate ideas/points clearly due to: (1) inappropriate use of terminology and vague language; (2) reliance on disjointed and incomprehensible thoughts and clauses;

			organization of ideas and thoughts.		and/or repetitive; and (3) poor organization.	and (3) lack of recognizable organization.

b) Rubric for final exam: Lab exercises (50%)

Criterion	CLO	Weight	Exceeds Expectations	Meets Expectations	Below Expectations
Quality of response		**100% (10 marks)**	**Performance is above the expectations stated in the outcomes. Achieves what it was designed to do. Operates without errors.**	**Performance meets the expectations stated in the outcomes. Achieves what it was designed to do. Operates with some errors.**	**Performance does not meet the expectations stated in the outcomes. Not achieves what it was designed to do. Operates with some errors.**
Question 1	**1,2,4**	30%	2.5-3.0	1.0-2.5	0-1
Question 2		30%	2.5-3.0	1.0-2.5	0-1
Question 3		20%	1.5-2.0	1.0-1.5	0-1
Question 4		20%	1.5-2.0	1.0-1.5	0-1

8. Teaching plans

Teaching plans for theory (4.5 class-time unit per session)

Week/session	Content	CLO	Teaching and learning activities	Reviews / Assessment	Main documents and references
(1)	(2)	(3)	(4)	(5)	(6)
1.Week 1/ Theory Session 1	Chapter 1: Overview of information system design, analysis, and Power Designer tools 1.1 Overview of System Design & Analysis. 1.1.1 Purpose, requirements, and methods. 1.1.2 Analysis of information system (functions, data). 1.1.3 Designing information system (overall, database, program). 1.2 Power Designer (PD) overview. 1.2.1 General introduction about PD. 1.2.2 Get familiar with the PD interface and plugins. 1.2.3 Link and synchronize models with PD.	CLO 3	Lecturers: + Presentation (3.5 class-time) + Organize discussions / exercises (1.0 class-time). Student: + Study in class: listening to lectures, discussing + Study at home: read documents, do homework, do group work. + On LMS system: do homework, read documents, discuss (forum).	A1.1 Exercise chapter 1	Chapter 1,2,8,9,10
2.Week 2/ Theory Session 2	Chapter 2: Power designer and business process model 2.1 Basic business process modeling. 2.2 The rules in the business process model. 2.3 Build a business process model. 2.4 Use CRUD matrices. 2.5 Work with a business process model.	CLO 1.1, CLO 1.2, CLO 2, CLO 5	Lecturers: + Presentation (3.5 class-time) + Organize discussions / exercises. (1.0 class-time) Student: + Study in class: listening to lectures, discussing + Study at home: read	A1.1 Exercise chapter 1	Chapter 1,2

Week/session	Content	CLO	Teaching and learning activities	Reviews / Assessment	Main documents and references
(1)	(2)	(3)	(4)	(5)	(6)
			documents, do homework, do group work. + On LMS system: do homework, read documents, discuss (forum).		
3. Week 3/ Theory Session 3	Chapter 2: Power designer and business process model (cont.) 2.6 Models are generated from business process models. 2.7 Summary of chapters & exercises. Chapter 3: PowerDesigner and data concept model 3.1 Basic model of DATA CONCEPT. 3.2 Use the rules in the model CONCEPT DL.	CLO 1.1, CLO 1.2, CLO 2, CLO 3 , CLO 4 , CLO 5	Lecturers: + Presentation (3.5 class-time) + Organize discussions / exercises (1.0 class-time). Student: + Study in class: listening to lectures, discussing + Study at home: read documents, do homework, do group work. + On LMS system: do homework, read documents, discuss (forum).	A1.1. Chapter 2 exercise A1.2 mini project exercise: choose the topic. A1.3 exercise number 1, model BPM	Chapter 3,4,511,12,13,14, 17
4. Week 4/ Theory Session 4	Chapter 3: PowerDesigner and data concept model (cont.) 3.3 Building a model CONCEPT DATA. 3.4 Working with the DATA CONCEPT model. 3.5 The models are born from the model CONCEPT DATA.	CLO 1.1, CLO 1.2, CLO 2, CLO3, CLO 4, CLO 5	Lecturers: + Presentation (3.5 class-time) + Organize discussions / exercises (1.0 class-time). Student: + Study in class: listening	A1.1 chapter 3 exercise A1.2 mini project exercise: choose the topic A1.3 exercise number 2	[1] Chapter 2. [2] Chapters 2, 3.

Week/session	Content	CLO	Teaching and learning activities	Reviews / Assessment	Main documents and references
(1)	(2)	(3)	(4)	(5)	(6)
	3.6 Summary of chapters & Exercises.		to lectures, discussing + Study at home: read documents, do homework, do group work. + On LMS system: do homework, read documents, discuss (forum).		
5.Week 5/ Theory Session 5	Chapter 4: Power designer and data physics model 4.1 Basic model of PHYSICAL DATA. 4.2 Use the rules in the PHYSICS model. 4.3 Build chart of PHYSICAL DATA. 4.4 Constructing multidimensional PHYSICAL DATA charts. 4.5 Work with the PHYSICAL DATA model. 4.6 The models were born from the PHYSICAL Model. 4.7 Summary of chapters & Exercises.	CLO 1.1, CLO 1.2, CLO 2, CLO 3, CLO 4, CLO 5	Lecturers: + Presentation (3.5 class-time) + Organize discussions / exercises (1.0 class-time). Student: + Study in class: listening to lectures, discussing + Study at home: read documents, do homework, do group work. + On LMS system: do homework, read documents, discuss (forum).	A1.1 chapter 4 exercise A1.2 mini project exercise: start working. A1.3 exercise number 4	Page 13-48, page 75-108, Page 159-198 Page 427-453
6.Week 6/ Session 6	Chapter 5: Power designer and object-oriented model 5.1 The basics of the Object-Oriented model	CLO 1.1, CLO 1.2, CLO 2, CLO3, CLO 4, CLO 5	Lecturers: + Presentation (3.5 class-time) + Organize discussions / exercises (1.0 class-time).	A1.1. Exercise chapter 5	Chapter 24,25

Week/session	Content	CLO	Teaching and learning activities	Reviews / Assessment	Main documents and references
(1)	(2)	(3)	(4)	(5)	(6)
	5.2 Construct graph of USE, CLASS, AUDIENCE 5.3 Build COOPERATION, WEEKLY chart 5.4 Construct chart of STATE, ACTIVITY, COMPOSITION, IMPLEMENTATION 5.5 Work with an Object-Oriented model.		Student: + Study in class: listening to lectures, discussing + Study at home: read documents, do homework, do group work. + On LMS system: do homework, read documents, discuss (forum).		

6.Week 6/ Session 6	Chapter 6: XML modeling and reporting
	6.1 XML MODEL
	  6.1.1 Basic XML model.
	  6.1.2 Build the XML model.
	  6.1.3 Work with the XML model.
	  6.1.4 The models are born from the MANUAL MODEL.
	6.2 ANALYSE AND DESIGN DOCUMENTATION REPORT with Power Designer
	  6.2.1 Use the report editor.
	  6.2.2 Management of reporting models (single and multidimensional)
	  6.2.3 Construction reports
	6.3 Summary of chapters & Exercises
			Lecturers:
			 + Presentation (3.5 class-time)
			 + Organize discussions / exercises (1.0 class-time).
			
			ssStudent:
			 + Study in class: listening to lectures, discussing
			 + Study at home: read documents, do homework, do group work.
			 + On LMS system: do homework, read documents, discuss (forum).
				A1.1. Exercise chapter 6
				 A1.2. Small project: presentation preparation
				 A1.3. Practice review
					Chapter 24,25

9.   Course regulations

- Students must complete assignments on schedule by the end of lessons

- Students actively work in groups to report small projects, request to inform teachers of the group's online meeting schedule for teachers (if possible) to attend and evaluate.

- Project reports must present presentations and will strictly penalize cases of copying / copying other people's work.

- Students must complete small projects to get a mid-term score.

- Students must attend all the practice sessions and submit their papers at the end of the practice session. Absolutely do not accept late payment.

- When students need to contact teachers (questions, submissions, opinions, etc.), students need to write clearly email messages.

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