COURSE SYLLABUS

CTT227 – Data Visualization

1.   GENERAL INFORMATION

Course name:	Data Visualization
Course name (in Vietnamese):	Biểu diễn thông tin
Course ID:	CTT227
Knowledge block:	Major of Information System
Number of credits:	4
Credit hours for theory:	45
Credit hours for practice:	30
Credit hours for self-study:	90
Prierequisite:	N/A

2.   COURSE DESCRIPTION

The course provides a knowledge base on the direct representation of data to produce "insight" (visual information) that allows trends, highlights, patterns, outliers, or other important information that we can't be if we only look at the original data. Students will learn how computers display information graphically and how the recipient perceives the information visually. Students will also learn types of data, including quantitative and non-quantitative data, and how we are properly mapped to the elements of direct systematization so that the observers understand the meaning of data. The result of course will be used to support decision-making and build an efficient dashboard.

3.   COURSE GOALS

On successful completion of this course, students will be able to:

ID	Description	Program LOs
G1	Work independently or in a group to solve issues in data visualization	2.2.1, 2.2.2, 2.3.2
G2	Practice English reading comprehension skills by reading textbooks and other documents related to data visualization	2.4.3, 2.4.5
G3	Understand key concepts of data visualization, types of data, and elements in data visualization	4.1.1; 4.1.2; 4.1.3; 4.1.4
G4	Apply visual methods to build a dashboard for the information system	1.4.1
G5	Evaluate visual representation in the dashboard	6.1.2

4. COURSE OUTCOMES

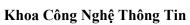| CO	Description	I/T/U
G1.1	Understand and explain clearly key concepts of data visualization	T
G1.2	Understand and explain the purpose of data visualization	T
G2.1	Know how to choose and use elements of data visualization	U
G2.2	Understand and Identify types of data and tasks in visualization	U
G3.1	Understand and use methods in visualization for the small and large data set	U
G3.2	Know how to use marks and channels in data visualization	U
G4.1	Understand the concept of the dashboard and know the necessary components in the dashboard	T
G4.2	Know how to use Tableau to build visual representations	U
G4.3	Use D3.js to build visual representations	T
G5.1	Analyze visual representation to identify good or bad chart	U
G5.2	Indicate a data visualization technique mentioned in the document/article	T
G5.3	Verbal expression of goals, contributions, pros and cons, lessons learned from the document/article	T

5. TEACHING PLAN OF THEORY

ID	Topic	Course outcomes	Teaching/Learning Activities (samples)	Assessments

*Đề cương môn học **Biểu diễn thông tin***

1	Introduction of data visualization	1.1	Lecturing, Discussion	
2	Data abstraction	1.2	Lecturing, Discussion	HW01
3	Task abstraction	1.2	Lecturing, Discussion	HW02
4	Mark & channel	3.2	Lecturing, Discussion	HW03
5	Arrange – Table	3.1	Lecturing, Discussion	HW04
6	Color channel	3.1, 3.1	Lecturing, Discussion	HW05
7	View	3.1,3.2	Lecturing, Discussion	HW06
8	Facet	3.1, 3.2	Lecturing, Discussion	HW07
9	Reduce	3.1, 3.2	Lecturing, Discussion	HW08
10	Embed	3.1, 3.2	Lecturing, Discussion	HW09
11	Dashboard	4.1, 5.1,5.2,5.3	Lecturing, Discussion	HW10

6. TEACHING PLAN OF LABORATORY

ID	Topic	Course outcomes	Teaching/Learning Activities (samples)	Assessments
1	Introduce tools of data visualization	4.2	Lecturing	
2	Introduce laboratory project		Lecturing	
3	Introduce how to use D3.js	4.3	Lecturing	

7. ASSESSMENTS

ID	Topic	Description	Course outcomes	Ratio (%)
HW#?	Theory exercise	Apply theory to do exercise	G1, G2, G3	10%
HW#?	Seminar	Present result of data visualization case studies	G5	10%
LAB 04	Project	Workgroup	G1, G2, G3, G4	25%

*Đề cương môn học **Biểu diễn thông tin***

LAB #?	Laboratory exercise	Apply manipulation / programming skills on tools that support data representation	G4, G5	5%
	Final exam		G1, G2, G3, G4, G5	50%

8. RESOURCES

Textbooks:

1. Visualization Analysis and Design, Tamara Munzner, AK Peters Visualization Series, CRC Press, 2014.

Reference books:

1. The Visual Display of Quantitative Information, 2nd Edition, Edward Tufte, Graphics Press, 2001.

2. Envisioning Information, 3rd Edition, Edward Tufte, Graphics Press, 1990.

3. Information Visualization: Perception for Design, 3rd Edition, Colin Ware, Elsevior, 2013.

Courses : *Information Visualization: Foundations*

9. POLICIES

1. Students need to abide by the rules and regulations of the Faculty and the University.

2. Regular class attendance is strongly advised and is necessary for students to fully grasp many of the course concepts.

3. Please be on time for class.

4. If you miss a class session, it will be your responsibility to find out the materials that were covered.

5. For any cheating in the course of doing assignments or exams, students are subject to all disciplinary measures by the Faculty/School and 0 points for this subject.

*Đề cương môn học **Biểu diễn thông tin***