Title (Units):	**ITEC2016 Data-Driven Visualization for the Web (3,3,0)**
Course Aims:	Information today is overwhelming; we need a way to analyse and interpret information such that its underlying meaning could be quicker to be seen. Data visualization is the most intuitive solution, where visual elements like charts and maps are highly effective in communicating quantitative messages.

What would you do if you want to visualize data on your website today? Manually plotting charts with your drawing software, or generating the same old static charts with your word processing software? In this media-rich HTML5 era, a wide variety of interactive dynamic charts could be easily developed and presented on your website.

Thus, this course aims to equip our students with essential knowledge on web development and data-driven story-telling. On completion of the course, students should be able to develop and publish interactive data visualization on a website. |
| **Prerequisite:** | General Education - Quantiative Reasoning (GFQR) |

Course Intended Learning Outcomes (CILOs):
Upon successful completion of this course, students should be able to:

No.	Course Intended Learning Outcomes (CILOs)
	Knowledge
1	Describe the basic building blocks of a website.
2	Describe and explain the concepts of data-driven story-telling and data visualization.
3	Describe and discuss some visual communication principles which could enhance the user experience on using the interactive data visualizations.
	Skill
4	Develop a simple website
5	Develop an interactive data visualization to present a finding.

Calendar Description:	Information today is overwhelming; we need a way to analyse and interpret information such that its underlying meaning could be quicker to be seen. Data visualization is the most intuitive solution, where visual elements like charts and maps are highly effective in communicating quantitative messages.

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Teaching and Learning Activities (TLAs):

CILOs	Type of TLA
1-3	Students will attend lectures to learn the concepts of web and data-driven story-telling.
4-5	Students will attend programming sessions to gain practical skills on web development and the production of interactive data visualizations.

Assessment:

No.	Assessment Methods	Weighting	CILOs to be addressed	Description of Assessment Tasks
1	Continuous Assessment	60%	1-5	Continuous assessment, including assignments and project, is designed to measure how well the students have learned the basic concepts in web development and the production of interactive data-driven visualizations.
2	Examination	40%	1-5	Final examination questions are designed to see how far students have achieved their intended learning outcomes.

Assessment Rubrics:

Excellent (A)	• Able to design and construct an interactive data-driven visualization with original ideas. • Demonstrate an excellent self-learning capability. • Achieve all intended learning outcomes.
Good (B)	• Able to design and construct an interactive data-driven visualization by combining and extending examples. • Demonstrate a good understanding of web technologies and the concepts of data story-telling. • Full mastery of all basic web development skills.
Average (C)	• Able to create an interactive data-driven visualization with substantial help and guidance. • Adequate knowledge on web development and technologies.
Satisfactory (D)	• Produce a less than workable interactive data-driven visualization. • Able to explain the basic components of a website. • Demonstrate a satisfactory understanding of web technologies.
Unsatisfactory (F)	• Unable to identify and explain the basic components of a website. • Unable to create a data-driven visualization.

Course Content and CILOs Mapping:

Content		CILO No.
I	Technology Fundamentals	1,4
II	Data-driven Storytelling	2, 3, 5
III	Enhancing User Experience	1-5
IV	Advanced Topics	1, 3, 4

References:

• Heydt, Michael. *D3.js by example: create attractive web-based data visualizations using the amazing JavaScript library D3.js*. Birmingham: Packt Publishing, 2015. Print.
• Knaflic, Cole N. *Storytelling with data: a data visualization guide for business professionals. Hoboken*, New Jersey: Wiley, 2015. Print.
• Meeks, Elijah. *D3.js in action.* Shelter Island, NY: Manning Publications, 2015. Print.
• Rininsland, Ændrew, and Swizec Teller. *Learning d3.js data visualization: inject new life into your data by creating compelling visualizations with d3.js.* Birmingham, UK: Packt Publishing, 2016. Print.
• Williams, Robin. *The non-designer's design book: design and typographic principles for the visual novice.* San Francisco, California: Peachpit Press, 2015. Print.

Course Content:

Topic

I.   Technology Fundamentals

A. The web
B. HTML5 and Cascading Style Sheets (CSS)
C. JavaScript
D. Scalable Vector Graphics (SVG)

II. Data-driven Storytelling
   A. Concepts of data visualization
   B. Charts, maps and infographics
   C. Data formats and data binding

III. Enhancing User Experience
   A. Visual communication principles
   B. Animated visual
   C. Adding interactivity

IV. Advanced Topics
   A. Building data-driven web application
   B. Data visualization on mobile