COMM 5961 (Data Driven Product and Service Design)

2021-2022 First Term

School of Journalism and Communication

The Chinese University of Hong Kong

Course Description

With the continuous development of the Internet to meet the growth of smart cities and the upcoming 4th industrial revolution, technologies such as IoT (Internet of Things), cloud computing, artificial intelligence, blockchain, immersive-tech, and big data are increasingly being integrated into the fabric of our lives and works. These technologies pose tremendous challenges to industries and organisations. How to adopt them for digital transformation of the business to keep up with the market is becoming a priority.

As smart, connected, and data driven products and services become more prevalent in this coming decade, knowing the sources of data and acquiring them programmatically for further cleaning, filtering, aggregation, modelling, evaluation, visualisation, and on-demand interaction are becoming mandatory. This course aims to help students understand the context of this development and equip them with the required research, design, coding and testing skills for pursuing a career in the field.

Expected Learning Outcome

After taking the course, students will be able to:
1) Conduct UX/UI research to define product requirements.
2) Transform requirements into design prototype.
3) Master fundamental front-end (HTML/CSS/JS) and back-end (Python/SQL) coding skills.
4) Use digital tools to perform data pre-processing and visualisation.
5) Perform usability studies and A/B tests for evaluation.

Contact Information

Teacher ‘s Name	Prof. Bernard Suen (https://www.bschool.cuhk.edu.hk/staff/suen-bernard/)
Email:	bernard@cuhk.edu.hk
Teaching Time & Venue:	Monday 6:30 to 9:30pm

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One Day Pre-Class Workshop on HTML, CSS, and Github 1.Introduction to HTML and CSS 2.Introduction to Git and Github
Module 1 - Basic Python Programming I
Module 2 - Basic Python Programming II
Module 3 - Introduction to Relational Database and SQL
Module 4 - Basic Python Web Programming in Flask I
Module 5 - Basic Python Web Programming in Flask II
Module 6 - Basic Front-end Programming in JavaScript
Module 7 - Design Thinking for User Research
Module 8 - Prototyping in Figma for the Responsive Web
Module 9 - Data Scraping and Pre-processing
Module 10 - Data Visualisation in JavaScript
Module 11 - Usability and A/B Testing
Module 12 - Code Testing and Integration
Module 13 Final Presentation

Assessment Scheme

Assessment Scheme	Description	Weight
1) 10 problem sets that include both coding and multiple choice questions (open book without time limit).	Each problem set will be submitted at the beginning of the next class unless specified otherwise by the instructor.	50%
2) Project Proposal (individual)	Submit a project proposal to be approved by the instructor.	10%
3) Final project (individual)	A responsive web project demonstrating mastery of the expected learning outcome.	40%

Grade Descriptors

Grade	Criteria / standard / different levels of attainment of the desired learning outcomes
A	Demonstrates the ability to synthesize and apply the principles or subject matter learnt in the course, to novel situations and/or in novel ways, in a manner that would surpass the normal expectation at this level, and typical of standards that may be common at higher levels of study or research. Has the ability to express the synthesis of ideas or application in a clear and cogent manner.
A-	Demonstrates the ability to state and apply the principles or subject matter learnt in the course to familiar and standard situations in a manner that is logical and comprehensive. Has the ability to express the knowledge or application with clarity.
B *	Demonstrates the ability to state and partially apply the principles or subject matter learnt in the course to most (but not all) familiar and standard situations in a manner that is usually logically persuasive. Has the ability to express the knowledge or application in a satisfactory and unambiguous way.

C*	Demonstrates the ability to state and apply the principles or subject matter learnt in the course to most (but not all) familiar and standard situations in a manner that is not incorrect but is somewhat fragmented. Has the ability to express the separate pieces of knowledge in an unambiguous way.
D*	Demonstrates the ability to state and sometimes apply the principles or subject matter learnt in the course to some simple and familiar situations in a manner that is broadly correct in its essentials Has the ability to state the knowledge or application in simple terms.
F	Unsatisfactory performance on a number of learning outcomes, OR failure to meet specified assessment requirements.

*Sub-division (i.e. B+, B, B-, C+, C, C-, D+) would still be applied.

Learning Activities (Hours per Week)

Lecture	Interactive Tutorial	Discussion of Cases	Field Trip	Project	Web-based learning	Others
2 hr/ week	1 hr week			1 Personal Project	5 to 8 hours/ week on problem set.	Field research on personal project

Recommended Reading

1. Andreessen, Marc (2011) Why Software is Eating The World. The Wall Street Journal, August 20, 2011.
2. Buytaert, Dries (2015) No, Data is Eating the World. Recode.net, Jan 7, 2015 (https://www.vox.com/2015/1/7/11557562/no-data-is-eating-the-world).
3. Cprime. What is Agile? What is Scrum? (https://www.cprime.com/resources/what-is-agile-what-is-scrum/)
4. Davenport, Thomas H. and Patil D.J. (2012) Data Scientist: The Sexiest Job of the 21st Century. Harvard Business Review October 2012 Issue. (https://hbr.org/2012/10/data-scientist-the-sexiest-job-of-the-21st-century)
5. Edelman, Gil (2015) How to Choose your Technology Stack, SV/SG Blog (https://svsg.co/how-to-choose-your-tech-stack/)

6. Garrett. J. J. (2011) Chap. 2 The Elements of User Experience (http://www.jjg.net/elements/pdf/elements_ch02.pdf)
7. Nielsen. J. (2000) Why You Only Need to Test with 5 Users. Alert Box March 2000 (https://www.nngroup.com/articles/why-you-only-need-to-test-with-5-users/)
8. Nielsen, J., (2012) Usability 101: Introduction to Usability, Alert Box (https://www.nngroup.com/articles/usability-101-introduction-to-usability/)

References on Academic Honesty and Plagiarism

Attention is drawn to University policy and regulations on honesty in academic work, and to the disciplinary guidelines and procedures applicable to breaches of such policy and regulations. Details may be found at http://www.cuhk.edu.hk/policy/academichonesty/.

With each assignment, students will be required to submit a signed declaration that they are aware of these policies, regulations, guidelines and procedures.

- In the case of group projects, all students of the same group should be asked to sign the declaration, each of whom is responsible and liable to disciplinary actions should there be any plagiarized contents in the group project, irrespective of whether he/she has signed the declaration and whether he/she has contributed directly or indirectly to the plagiarized contents.

- For assignments in the form of a computer-generated document that is principally text-based and submitted via VeriGuide (https://academic.veriguide.org/academic/login_CUHK.jspx), the statement, in the form of a receipt, will be issued by the system upon students' uploading of the soft copy of the assignment.

Assignments without the properly signed declaration will not be graded by teachers.

Only the final version of the assignment should be submitted via VeriGuide.

The submission of a piece of work, or a part of a piece of work, for more than one purpose (e.g. to satisfy the requirements in two different courses) without declaration to this effect shall be regarded as having committed undeclared multiple submission. It is common and acceptable to reuse a turn of phrase or a sentence or two from one's own work; but wholesale reuse is problematic. In any case, agreement from the course teacher(s) concerned should be obtained prior to the submission of the piece of work.

Any assignment which shows evidence of plagiarism will be penalized severely. Plagiarism is the copying of passages from other sources without proper citation or attribution. In the case of plagiarism, the minimum penalty is one demerit and a zero mark for the assignment.

Feedback for evaluation

Students are welcome to give comments and feedback at any time during the class. Stop by to talk to the instructor. You can also send us emails for comments.