HUM-297

# Data-driven interface design

Cherubini Mauro

| Cursus | Sem. | Type |
|---|---|---|
| Humanities and Social Sciences | BA5 | Obl. |
| UNIL - HEC | H | Opt. |

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| Language of teaching | English |
| Credits | 2 |
| Session | Winter |
| Semester | Fall |
| Exam | During the semester |
| Workload | 60h |
| Weeks | 14 |
| **Hours** | **2 weekly** |
| Courses | 2 weekly |
| **Number of positions** | **40** |

## Remark

Une seule inscription à un cours SHS+MGT autorisée. En cas d'inscriptions multiples elles seront toutes supprimées sans notification.

## Summary

This course explores how data from digital interactions can be analyzed to improve design, usability, and engagement. Students will learn quantitative methods to collect, organize, and interpret data, generating insights to enhance digital services and user experiences.

## Content

In today's UX practice, understanding the impact of our design **decisions at scale** is more crucial than ever. While qualitative insights help us explore user motivations and pain points, it's through **quantitative methods** that we validate, generalize, and optimize our work. This course introduces students to the core principles and techniques of quantitative UX research. From foundational statistics to experimental testing and data visualization, you'll gain hands-on experience using data to inform design choices. Whether you're conducting surveys, analyzing user behavior through analytics, or quantifying feedback, this course equips you with the tools to make **evidence-based decisions** and communicate findings with confidence.

**Content**

The course will start providing a basic perspective on usability and heuristics of design to move progressively towards the quantitative analysis of the user interaction with a digital service. The following topics will constitute the backbone of the course:

- Introduction to UX and Research Methods
- Statistics and Quantitative Analysis
- Designing UX Research Studies
- Early-Stage UX Testing Techniques
- Survey Design and Evaluation
- Usability Metrics and Frameworks
- Web and App Analytics
- A/B and Multivariate Testing
- Quantifying and Visualizing Qualitative Data
- Storytelling with Data

## Keywords

A/B Testing, Data Analysis, Digital Services, Engagement & Retention, Interaction Design, Quantitative Methods,

Usability, User Behavior, User Experience (UX), User-Centered Design

## Learning Outcomes

By the end of the course, the student must be able to:

- Design and Execute Quantitative UX Studies. Learners will understand how to structure researchâ##from survey and experiment design to participant recruitment and bias reduction. Emphasis is placed on ethical data practices and ensuring study validity, which are essential for producing trustworthy results.
- Apply Core Statistical Techniques to UX Research. Students will learn to interpret and apply statistical methods such as descriptive statistics, t-tests, ANOVA, and regression analysis. These tools help determine the significance and reliability of findings, enabling more confident design decisions based on user data.
- Translate Data into Actionable UX Insights. By the end of the course, students will be able to clean, code, and visualize data using tools like Excel, R, or Python. They will also learn to effectively communicate findings to stakeholders using frameworks and visual storytelling, ensuring their insights influence product strategy.

## Transversal skills

- Take feedback (critique) and respond in an appropriate manner.
- Demonstrate the capacity for critical thinking
- Demonstrate a capacity for creativity.
- Plan and carry out activities in a way which makes optimal use of available time and other resources.
- Communicate effectively with professionals from other disciplines.

## Teaching methods

Class time will be devoted to discussing theory, answering students' questions, and for practical activities. The exploration of relevant theories and models is expanded through interactive sessions where the online materials will be complemented with case- and problem-based work in small teams.
Students will work in groups to complete a **capstone project** to deliver at the end of the course. The capstone project will focus on the analysis of a dataset containing traces of users interacting with digital services. The students will have to demonstrate knowledge of basic design and analysis methodologies acquired during the course. During group work, students will be asked to maintain a **logbook** to document the contributions of each member.

At the end of the course, there will be a final written exam consisting of a multiple-response quiz and open-ended questions.

When collaborating with other students, all members of a team receive the same score on their work (which might be adjusted based on the logbook). Students are expected to show professional conduct and equally contribute to the work of the team. Teams are responsible for managing and coordinating themselves, including the resolution of in-team conflicts. In case of systematic conflicts which impedes work from advancing, students can ask the TA or the instructor of the course for support. Missing deliverables will negatively impact the grade given to the analytical task. Proven misconduct (e.g., plagiarism, freeriding) will result as a "0" given to the group work component of the evaluation with no opportunity to compensate or make-up.

No carry-over grades: Grades (and bonus points) obtained last year are not valid this year and cannot be carried over. Students who retake the class are required to also engage in all graded activities.

## Expected student activities

Students will develop their project during class sessions. They might need to adjust and finalize their work outside of class hours if necessary.

## Assessment methods

Knowledge acquired within the course will be assessed by two to three complementary deliverables: **a group presentation**, a written report of the group work (UNIL students only), and an **individual written exam**.
UNIL students are required to deliver the written report, which is going to be graded and it is an integral part of the

evaluation. For EPFL students delivering the written report is optional and it is not considered for the final grade of the course.
The group presentation (and its written report) will account for 50% of the final grade, while the individual written exam will account for the remaining 50% of the final grade. Each deliverable will be graded separately (i.e., 2 to 3 separate grades) and the final grade will be the weighted average of the grades.
The group presentation will happen on the last day of the course and it will be an integral part of the evaluation of the course. All students are required to attend. The individual written exam will be organized on the penultimate class. The exam will be taken on the participants' laptop. Documentation, notes and course slides can be used during the exam but on paper only. The capstone project written report will have to be submitted by UNIL students during the winter exam session on a deadline that will be communicated through Moodle.

## Supervision

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| Office hours | No |
| Assistant.e.s | Yes |
| Forum | Yes |

## Resources

### Virtual desktop infrastructure (VDI)

No

### Bibliography

The course will loosely follow the following books:

- Rogers, Y; Sharp, H.; Preece, J (2023). Interaction Design: Beyond Human-computer Interaction. Wiley, 6th edition (ISBN: 978-1-119-90109-9)
- Sauro, J.; Lewis J.R. (2016). Quantifying the User Experience: Practical Statistics for User Research. Morgan Kaufmann, 2nd edition (ISBN: 978-0-12-802308-2)

### Ressources en bibliothèque

- Retrouver les références à la Bibliothèque

### Moodle Link

- https://go.epfl.ch/HUM-297