



UIUX DEVELOPER ANALYST PRACTICUM

PROGRAM OUTLINE

Full-Time Program
840 Hours of Classroom Instruction
210 Hours of Practicum
1050 Total Hours in Duration
70 Weeks in Total (Including Breaks)



PROGRAM DESCRIPTION

In this instructor led multidisciplinary program, students will learn to create and evaluate user interfaces for a variety of platforms such as: web sites, mobile applications, and data driven information systems. User Experience (UX) encompasses a wide range of activities including User Interface (UI) design, Information Architecture (IA), lab studies and field research.

CAREER OCCUPATION PROGRAM

NOCs: 2172

This program prepares students for the following career occupations:

UX Designer, UX Engineer, UI/UX Developer, UX Researcher, Experience Designer, Interaction Designer, Information Architect, UX Strategist, UX Analyst, Visual Designer, UI Designer, Digital Designer, UI Artist, Front-End Developer, Content Strategist, UX Copywriter

ADMISSION REQUIREMENTS

Admission requirements may not be waived by either the student nor the Canadian College of Technology and Business (CCTB).

No funding may be disbursed to the student or received by CCTB until all admission requirements are met.

A payment plan can be offered to a student if student loan is not an available option.

Requirements:

- Good command of English language (See [Language Proficiency Policy](#))
- High school diploma or equivalent from an approved government institution of applicant's home country, or applicant is minimum 19 years of age
- Students are required to have and use their own personal computer in class

LEARNING OBJECTIVES

After completing this program, students will be able to:

- Demonstrate the ability to: evaluate multiple interface alternatives and understand why these are essential to excellent interaction design
- Utilize the relationship between need finding and prototyping and understand how closely one flows into the other
- Conduct fieldwork to gather design ideas and how to make paper prototypes and low-fidelity mock-ups that are interactive



- Understand how to use these designs to get feedback from other stakeholders such as: teammates, clients, and users. With these design-thinking strategies students will be able to do more creative human-centered design in any domain
- Obtain conceptual knowledge of rapid prototyping and heuristic evaluation will become an essential attribute of students' future progression into UIUX program
- Perform input directly on top of output in Direct Manipulation
- Illustrate the benefits of direct manipulation in real interfaces
- Relate importance of representations, such as understanding a user's mental model and helping people to distribute cognition
- Foundation of user interfaces: scale, contrast, pattern, shape, color, typography, and layout
- Test designs with real users
- Model user behavior mathematically
- Understand Fitts' Law
- Trace input from the fingertip to the screen, and think about the diversity of possible input devices and their relative merits
- Find what is needed or finding something when the search parameters are unclear or unknown: from e-commerce to digital libraries, good search design is central to human-computer interaction in the 21st century
- Differentiate gestural interfaces and how they work
- Demonstrate an open-minded approach to the importance of users' needs, goals, and values in their day-to-day lives to understand Fitts' Law
- Demonstrate new perspectives on solving problems and identify opportunities for creating meaningful and accessible designs
- Know the process for idea generation
- Skillfully choose which ideas to pursue and which ones to leave out, and who to include in the brainstorming process and why
- Understand how to interpret data results
- Use designers' techniques: personas, journey maps, diagramming and the 2x2 matrix
- Take many disparate pieces of data and turn them into an actionable opportunity area for design
- Build ideas quickly, making many prototypes, and providing only essential details
- Make ideas tangible to answer specific questions. Prototyping including storyboards, role-plays, walkthroughs, and touchpoints
- Develop sketches, workflows, and prototypes
- Create wireframes and a communication element hierarchy
- Understand the importance of margins, spacing, text size, layout
- Use color theory and style guides
- Use Adobe Photoshop, Illustrator
- Use Sketch
- Find open-source tools and software suitable for a specific project



- Understand Information Architecture concepts to help UX designers find out how users think about the world, and transition those lessons to products
- Understand and use Foundations of Information Architecture (IA)
- Apply different methods of dealing with IA such as: card sorting to get information about user interactions, analyzing the results, and creating a validated information architecture plan.
- Translate plan into refined menus, content classification, and page layouts
- Creating sitemaps and user flows using Draw.io
- Use Sketch and Axure
- Test with reverse card sorting and monitoring feedback from server logs, site searches, and help desk calls
- Understand how UI choices differ between operating platforms
- Evaluate a mobile design and avoid bad mobile user experiences
- Designing for “mobile first”
- Use best usability practices when designing for mobile
- Apply UI patterns and elements for mobile
- Use of Wireframing and Prototyping tools and software for mobile
- Plan a mobile user experience using personas and task modelling
- Implement a mobile UX design strategy that is supported with tips and techniques from across the industry
- Access a mobile app patterns, based on best practices that can be utilized in our own mobile designs
- Knowledgeably design, run, and analyze experiments that give statistical weight to designs.
- Overall experiment design theories and fundamentals
- Students will know how to analyze user preferences (or other tallies) using tests of proportions. They will also become familiar with R and RStudio
- Use independent and dependent variables, variable types, exploratory data analysis, p-values, asymptotic tests, exact tests, one-sample tests, two-sample tests, Chi-Square test, G-test, Fisher’s exact test, binomial test, multinomial test, post hoc tests, and pairwise comparisons
- How to design and analyze a simple website A/B test
- How to ensure that data is valid through the design of experiments, and that analyses are valid, by understanding and testing their assumptions
- How to achieve experimental control, confounds, ecological validity, the three assumptions of ANOVA, data distributions, residuals, normality, homoscedasticity, parametric versus nonparametric tests, the Shapiro-Wilk test, the Kolmogorov-Smirnov test, Levene’s test, the Brown-Forsythe test, and the Mann-Whitney U test
- Use of one-factor between-subjects’ experiments
- Understand and analyze data from two-level factors and three-level factors using the independent-samples t-test, Mann-Whitney U test, one-way ANOVA, and Kruskal-Wallis test. Students will learn how to report an F-test. They will also understand Omnibus tests and how they relate to post hoc pairwise comparisons with adjustments for multiple comparisons



- Use of one-factor within-subjects' experiments, also known as repeated measures, designs
- Counterbalance strategies to avoid carryover effects, including full counterbalancing, Latin Squares, and balanced Latin Squares. Students will understand and analyze data from two-level factors and three-level factors using the paired-samples t-test, Wilcoxon signed-rank test, One-Way repeated measures ANOVA, and Friedman test
- Experiment with multiple factors and factorial ANOVAs
- Analyses for non-normal or non-numeric responses for between-subjects' experiments using Generalized Linear Models (GLM)
- Nominal logistic regression, ordinal logistic regression, and Poisson regression
- Mixed effects models, specifically Linear Mixed Models (LMM) and Generalized Linear Mixed Models (GLMM)
- Understand the concept of data normalization and functional dependencies
- Understand database design methodologies and entity relationship modeling
- Use UML for diagramming notation
- Utilize SQL CRUD operations
- Demonstrate the knowledge and use of Data Definition Language (DDL) and Data Manipulation Language (DML)
- Understand database security, transaction management, triggers and stored procedures, replication, data warehousing and OLAP on a basic level
- Design a website that is optimized for search engine rankings
- Utilize Google Analytics for research
- Be proficient in computer graphics software
- Use HTML5 to create webpage structure: basic HTML5 tags, semantic HTML5, tables, forms, lists, basic layout
- Use CSS3 (Cascading Style Sheets) for website design: Document Object Model, CSS selectors & combinators, Box Object Model, positioning, Flexbox, CSS Grid, transformation and animations, introduction to SASS
- Create dynamic web pages using JavaScript
- Utilize the jQuery programming library
- Interact with the DOM with JavaScript
- Use NoSQL databases and MongoDB
- Understand how to implement Node.js and Express.js to build a web application
- Implement and create basic React.js dynamic webpages
- Use techniques involving visualization of the requirements. Basic use of the UML.
- Demonstrate a strong working knowledge of the basics of Project Management and will be able to immediately use that knowledge to effectively manage work projects
- Identify and manage the product scope, build a work breakdown structure, create a project plan, create the project budget, define, and allocate resources, manage the project development, identify, and manage risks, and understand the project procurement process
- Implement Agile Frameworks such as SCRUM and Kanban



- Understand lean UX as a business strategy
- Utilize MVP (Minimum Viable Product) to validate product hypotheses and user stories to capture a description of a feature from a user's perspective
- Generate powerful reports and dashboards that will help people make decisions and act based on their business data
- Use Tableau to create high-impact visualizations of common data analysis to help see and understand data
- Prepare and import data into Tableau and explain the relationship between data analytics and data visualization
- Assess how data and design work together, including how to choose the appropriate visual representation for the data, and the difference between effective and ineffective visuals
- Understand how to implement scatter plots, Gantt charts, histograms, bullet charts, charting guidelines
- Create projects with Tableau: dashboards, storytelling, data visualization
- A polished capstone project that can be shared in design portfolios to highlight work and document the design process
- Students will skillfully know how to research a user needs, create a project, and design it conducting heuristic evaluations (HEs)
- Plan core screens establish a time estimate and track projections to gauge pace
- Execute the whole project in timely manner and be able to present it on a professional level

PROGRAM EVALUATION METHODS AND COMPLETION REQUIREMENTS

CCTB evaluates students using a variety of methods including projects, assignments, presentations, assessments, quizzes, and exams. Students will be given a performance evaluation before 30% of the hours of instruction of the program are completed. This evaluation will address any academic concerns that the college may have regarding student performance and/or learning outcomes. This evaluation will also ensure the student comprehensively understands the grading system, and what actions they can take moving forward to achieve or maintain a higher grade.

To complete the program, students will be required to achieve a minimum grade of 65% in each course, as well as complete the co-op/ practicum component of their program.

The co-op/practicum component of the program includes a performance-based evaluation conducted by the placement host and an analysis report created by the student relating to their work experience that must be submitted to the faculty.

Additionally, to successfully complete the program, students must maintain a minimum attendance rate of 75%.

If a course is failed, the student must re-take the course within the next available cohort. The course re-take fee is \$1100.

Please reference the CCTB [Dispute Resolution and Grade Appeal Policy](#)



HOMEWORK HOURS

A minimum of 2.5 - 3 hours of homework between lectures is to be expected.

DELIVERY METHODS

- Combined delivery (both in-class and distance)

REQUIRED PROGRAM MATERIALS

Resources in the form of custom learning materials will be provided by CCTB.

Software tools and user licenses will be provided by CCTB.

Instructors will provide students with additional educational resources that will be specific to the subject matter of each course. These resources will be used in conjunction with the class lectures.

These resources and learning materials will be made available online via the CCTB Canvas learning management system. Students are required to login to gain access to the e-materials.

Students must have and use their own personal computer in class.

Required Learning Materials:

- [Information Architecture](#) , Web Style Guide 3rd Edition.
- [Information Architecture Concepts](#) 
- [Components Used in Information Architecture](#) 
- [Information Architecture 3.0](#) 
- [Understanding Information Architecture](#) 
- <https://www.interaction-design.org/>
- <https://developer.android.com/design/index.html>
- <https://developer.apple.com/ios/human-interface-guidelines/overview/design-principles/>
- <http://onlinelibrary.wiley.com/doi/10.1111/bph.12856/full>

Additional Recommended Learning Materials (not required):

- Covert, Abby. How to Make Dense of Any Mess: Information Architecture for Everybody. CreateSpace Independent Publishing Platform (Nov. 4, 2014). ISBN-13: 978-1500615994.
- Tufte R., Edward. The Visual Display of Quantitative Information. Graphics Press (2001). ISBN-13: 978-1930824133.
- Gothelf, Jeff et al. Lean UX: Applying Lean Principles to Improve User Experience. O'Reilly Media (March 26, 2013). ISBN-10: 1449311652.
- Lidwell, William et al. Universal Principles of Design, Revised and Updated: 125 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better



- Saadatian, Elham, et al. Mediating Intimacy in Long-Distance Relationships Using Kiss Messaging. *International Journal of Human-Computer Studies* 72.10 (2014): 736-746.
- E. Saadatian, H. Samani, R. Nakatsu (2016) Design and Development of Playful Robotic Interfaces for Affective Telepresence. Book Chapter of *Handbook of Digital Games and Entertainment Technologies*, Springer.
- Monteiro, Mike. *Design is a Job. A Book Apart* (2012).
- Neumeier, Marty (2015) *The Brand Gap: How to Bridge the Distance Between Business Strategy and Design*. New Riders. ISBN-10: 0321348109.
- Kleon, Austin (2012) *Steal Like an Artist: 10 Things Nobody Told You About Being Creative*. Workman Publishing Company.
- Garrett James, J. *The Elements of User Experience: User-Centered Design for the Web and Beyond* (2nd Edition). New Riders (2010).
- Morville, P. Rosenfeld, L. *Information Architecture for the World Wide Web: Designing Large-Scale Web Sites*. O'Reilly Media (2006).
- Sauro, J. Lewis, J. *Quantifying the User Experience: Practical Statistics for User Research*. Morgan Kaufmann (2012). ISBN-10 : 0123849683.
- Duckett, J. *JavaScript and jQuery: Interactive Front-End Web Development*. Wiley 1st Edition (Nov. 8, 2011). ISBN-10: 1118008189
- Duckett, J. *HTML and CSS: Design and Build Websites*. Wiley 1st Edition (Nov. 8, 2011). ISBN-10: 1118008189
- Gothelf, J., Seiden, J. *Lean UX: Applying Lean Principles to Improve User Experience*. (2014): 736-746. O'Reilly Media; 1st edition (March 26, 2013). ISBN-10: 1449311652.
- Nussbaumer Knaflic, C. *Storytelling with Data: A Data Visualization Guide for Business Professionals*. Wiley; 1st edition (Nov. 2, 2015). ISBN-10: 1119002257
- Murray, Daniel. *Tableau Your Data: Fast and Easy Visual Analysis with Tableau Software*. (2016).

PROGRAM ORGANIZATION

1. Introduction to Human Centered Design	60 HRS
2. Introduction to Design Principles	60 HRS
3. Input and Interaction	60 HRS
4. User Experience: Research and Prototyping	60 HRS
5. Sketching, Wireframing, Prototyping and Visual Design	60 HRS
6. Information Design	60 HRS
7. Mobile User Experience Design	60 HRS
8. Designing, Running and Analyzing Experiments	60 HRS
9. Relational Database Systems and SQL	60 HRS
10. Front-End Web Development and Design Level 1	60 HRS
11. Front-End Web Development and Design Level 2	60 HRS
12. Business Analysis and System Design	60 HRS
13. Information Visualization	60 HRS
14. Interactive Design Capstone Project	60 HRS
Practicum Placement	210 HRS
Total Duration	1050 HRS



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