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| 5.00 credits | 30.0 h + 15.0 h | Q2 |
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| Teacher(s) | Vanderdonckt Jean ; |
| Language : | French |
| Place of the course | Louvain-la-Neuve |
| Prerequisites | None |
| Main themes | <p>Introduction</p> <ul style="list-style-type: none"> • Major principles of human-machine interaction and user-centered design • Evolution of the HMI: from textual to graphic, from real to virtual, from static to dynamic, from interactive to highly interactive. <p>HMI technology</p> <ul style="list-style-type: none"> • Software and hardware devices for interaction with the user • Concrete and abstract interactive objects • Techniques (eg pull-leash), styles (eg, command language, direct manipulation) • Means of interaction (eg trackball) • HMI development environments (programming languages, toolboxes, libraries, demonstration programming, automatic generation, assisted design) • HMI standards, standards and development guides (eg IBM CUA, ISO 9241, CBN, etc.) <p>Contributions external to HMIs</p> <ul style="list-style-type: none"> • Contributions of cognitive psychology, prescriptive models • Theory of perception, of attention • Software ergonomics <p>HMI development methodology</p> <ul style="list-style-type: none"> • Life Cycles and Models (eg V, Spiral, ProdUser, Nabra) • Existing methods (eg Muse, Trident, Diane +, SOMA) • Preliminary design (including task model) • Detailed design (including operational specifications) • Prototyping (fast or not, iterative or not) • Evaluation: evaluation methods with / without users, with heuristics, by observation. |
| Learning outcomes | <p>At the end of this learning unit, the student is able to :</p> <p>Students who have successfully completed this course will be able to:</p> <ul style="list-style-type: none"> • explain the challenges of human-machine interaction in order to design a human-machine interface (HMI) of an interactive application that is adapted to the user's task; • master the construction models of an HMI to use them wisely when designing an interactive application. <p>Students will have developed methodological and operational skills. In particular, they will have developed their ability to:</p> <ul style="list-style-type: none"> • use interface development tools and appropriate technologies when developing the interface of an interactive application. |

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| Evaluation methods | <p>Continuous assessment for this course is based on an assignment applying the interface design and evaluation method covered in the course to a case study. This assignment is structured according to the report template available on Moodle.</p> <p>There are two possible scenarios:</p> <p>for computer science students taking Prof. Tom Barbette's LINFO1002 Project 2 course, the group will be the same and the case study will be the one specified in the LINFO1002 course. The evaluation and design of the interface will be applied to the project defined in this course and will be the subject of a single integrated report to be submitted on the last working day of the semester (Friday, May 29, 2026, at 5 p.m. for the current academic year) by email to both professors, T. Barbette and J. Vanderdonckt. The section on the human-machine interface will be assessed by Prof. J. Vanderdonckt and will be included in the group grade for the LINFO1311 course.</p> <p>For all other students (e.g., in communication, linguistic engineering, management sciences, computer science, but not taking the LINFO1002 course), students are divided into groups of five and must complete the coursework, for which the report must be formatted according to the template available on Moodle and submitted by email to Prof. J. Vanderdonckt on the last working day of the semester (Friday, May 29, 2026, at 5 p.m. for the current academic year).</p> <p>The work report covers the following activities:</p> <ul style="list-style-type: none"> • Each group will select the interface of an existing interactive system and conduct a heuristic evaluation based on the ergonomic recommendations and criteria covered in the course in order to identify and classify 10 usability issues. Each group will perform a visual analysis of a selected screen using the visual techniques covered in the course. For students taking the LINFO1002 course, the interactive system will be chosen from the same field of application as the project. For other students, the choice is open. • Each group will produce a task model based on a textual statement for a selected task. • Each group will define and specify two contexts of use (a user based on a persona, a device, an environment). • Each group must design and justify the abstract interface and the concrete interface for the two contexts of use. These results will be incorporated into the work report. • Each group must submit the complete report covering all questions by the last working day of the semester, i.e., Friday, May 29, 2026, at 5 p.m |
| Teaching methods | <p>This introductory course to HCI consists of the following contents:</p> <ul style="list-style-type: none"> • Introduction to HCI and user interface: definition, scope, principles, models. • Usability Engineering: usability principles, guidelines, and ergonomic criteria. • User Interface Development Life Cycle: for each context of use (i.e., user and tsk, device, and environment) <ul style="list-style-type: none"> • Task modeling and domain modeling • Abstract user interface modeling • Concrete user interface modeling • Final user interface prototyping |
| Content | <p>The Association for Computing Machinery (ACM) defines Human-Computer Interaction (HCI) as "a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them". The primary object of study in HCI is the user interface, the means by which the user and a computer system interact, in particular the use of input devices and software.</p> |
| Inline resources | <p>All resources (slides, report template, examples, case studies, references) are available on-line at the Moodle corresponding course: https://moodle.uclouvain.be/course/view.php?id=4515</p> <p>W3C Introduction to Model-based User Interface Design</p> <p>W3C Abstract User Interfaces</p> |
| Bibliography | <ul style="list-style-type: none"> • Gaëlle Calvary, Joëlle Coutaz, David Thevenin, Quentin Limbourg, Laurent Bouillon, Jean Vanderdonckt, A Unifying Reference Framework for Multi-Target User Interfaces, June 2003, <i>Interacting with Computers</i> 15(3) |
| Other infos | <p>There is no pre-requisite for this course.</p> |
| Faculty or entity in charge | INFO |

| Programmes containing this learning unit (UE) | | | | |
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| Program title | Acronym | Credits | Prerequisite | Learning outcomes |
| Minor in numerical technologies and society | MINSTIC | 5 | |  |
| Master [120] in Information and Communication Science and Technology | STIC2M | 5 | |  |
| Additional module in computer science | APPSINF | 5 | |  |
| Master [120] in Linguistics | LING2M | 5 | |  |
| Bachelor in Computer Science | SINF1BA | 5 | |  |
| Minor in Computer Sciences | MINSINF | 5 | |  |