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الجمهورية التونسية
وزارة التعليم العالي والبحث العلمي
المدرسة العليا الخاصة المغاربية للعلوم والتكنولوجيا

## SYLLABUS

### CS 370 – USER INTERFACES AND HUMAN-COMPUTER INTERACTION (REQUIRED)
### (INTERFACE HOMME MACHINE)

<u>Detailed Syllabus:</u> (ABET accreditation format)

### Course Catalog Description

This course introduces students to the design of effective human-computer interfaces using a human-centered approach. The course covers the principles of human-computer interaction and the design and evaluation of user interfaces. Topics include the characteristics of human information processing and cognition, and how these characteristics affect the design of user interfaces. Topics include techniques for designing, building, and evaluating computer interfaces with a human-centered approach, best practices and known design principles.

### Course Requirements

- **Pre-requisites**: CS 321 (Principles of Software Engineering), CS 328 (OO Software design and construction)
- **Co-requisites**: None.
- **Credit Hours**:  6 ECTS/TN (3 US).
- **Program Outcomes ("**Compétences Programme**")**: 7, 8, 10, 19, 25, 54.
- **ABET Student Outcomes**: 2, 6.

### References

- **Textbook:**
  - <u>Required</u>: Norman, D. *The Design of Everyday Things*. Revised and Expanded Edition. Basic Books. 2013.
  - <u>Optional</u>: Rogers, Y., Sharp, H., Preece, J. *Interaction Design: Beyond Human-Computer Interaction*, 3rd ed. Wiley. 2011.
- **Others:**
  - Online guided course on MUST's learning platform.

### Instructor/Course Coordinator

Instructor:                                         Email:
Office:                                              Office Hours:
Course coordinator:                                 Teaching Assistant:

### Grading Policy

| Assessment | Week | Weight |
|------------|------|--------|
| Midterm    |      | 30%    |
| Project    |      | 15%    |
| Quizzes    |      | 5%     |
| Final      |      | 40%    |

## Course Learning Outcomes (CLOs)

| No. | CLOs | Assessment Methods | SOs |
|---|---|---|---|
| CLO1. | Describe and analyze a user interface using a design vocabulary, based on usability and principles of good design | | 2 |
| CLO2. | Demonstrate an understanding the cognitive principles that support human-centered design | | 2 |
| CLO3. | Describe special considerations in designing user interfaces for wellness. | | 2 |
| CLO4. | Apply the steps in interactive design including requirements definition, task analysis, prototyping and usability testing | | 2 |
| CLO5. | Design and implement useful, usable, and engaging graphical computer interfaces use prototyping tools and frameworks. | | 2 |
| CLO6. | Communicate and evaluate design prototypes with presentations, demos, and reports. | | 2, 6 |
| CLO7. | Conduct human-computer interaction research by proposing, developing, and conducting experiments; analyzing data; and developing synthesized results. | | 6 |

## Topics

| Topics | Chapter | Weeks |
|---|---|---|
| Introduction to interaction design and HCI: Good and poor designs, Human-centred design methods, interaction design, accessibility, user experience, usability criteria, design principles. | | 1, 2 |
| Cognitive Aspects: Understand cognition, cognitive processes, attention, perception and recognition, reducing memory load, annotation. | | 3 |
| Interfaces: user interface types, Web Content Accessibility Guidelines (WCAG) design and research issues, choosing a user interfaces to a given application or activity | | 4 |
| The process of interaction design definition: four basic activities of id, characteristics of interactive design, users and stakeholders | | 5 |
| Needs and requirements: The importance of requirements, different types of requirements, data gathering techniques, task descriptions, scenarios, use cases, task analysis | | 6 |
| User interface design | | 7 |
| Review. Project definitions. | | 8 |

| | | |
|---|---|---|
| Midterm. | | |
| UI prototyping and construction: types of prototypes, low-fi and hi-fi prototypes, compromises in prototyping, applying conceptual designs, mapping requirements to designs | | 9-10 |
| UI Evaluation: motivation, types of evaluation, evaluation of case studies, usability testing, conducting experiments & field studies | | 11 |
| Lofi prototyping | | 12 |
| Prototype construction, evaluation, and refinement | | 13 |
| UI development: Final simulation | | 14 |
| Final Assessment | | 15 |

## Student Outcomes (SOs)

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

## Approvals

Prepared by: _____      Signature:      Date:

Approved by the Dept.:      Signature:      Date: