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**Masinde Muliro University of Science and Technology**

School of Computing & Informatics

Department: Computer Science/Information Technology

Programmes: BSc – Computer Science/IT/ETS/ISKM

Course Code: BCS 323/BIT320

Course Title: HUMAN-COMPUTER INTERACTION

Credit Hours: 3 hrs.

Academic year: 2024/2025

Venue, Time: SPD004, Friday, 11.00 – 13.00 am

Lecturer: Jairus Odawa (BSc, MSc, PhD)

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Days of the week: Wednesday, 10.00am

**BCS323 HUMAN-COMPUTER INTERACTION**

**Course description**

This course is concerned with the joint performance of tasks by humans and machines. It emphasizes the importance of good interfaces and the relationship between interface design and effective human interaction with computers. Among the topics studied are the design and evaluation of effective user interaction designs, including principles and guidelines for designing interactive systems. Additionally, much emphasis is given to the development process for user interaction designs as an integral, but different, part of interactive software development.

**Course objective:**

The course aims at providing basic knowledge about concepts within the fields of human computer interaction and the psychology of the interaction process. Another purpose is to provide the students with tools for identifying factors affecting the communication between humans and computers in a positive and negative manner and to provide the design methods to improve that communication.

**Expected Learning outcomes**

Knowledge and comprehension- The student is, after completion of the course, expected to be able to:

* Give an account of basic concepts within the field of HCI (regarding human cognition, interfaces, interaction and iterative system development).
* Give an account of most of the existing styles of interaction, both from a user perspective and from a developer perspective.
* Give an account of a large number of interaction devices and be able to decide which usage situation it is best suited for.
* Describe different ways to design interactive computer systems, with regard to the people’s whole situation (e.g. mobility, affection, work and leisure, etc.)

Skills and capacities - The student is, after completion of the course, expected to be able to:

* Analyze interactive computer systems from a usability perspective.
* Conduct an expert evaluation (e.g. Heuristic Evaluation and Cognitive Walkthrough) of existing interactive systems.
* Adapt a design of an interactive computer system to the needs of different user groups.
* Create simple paper prototypes.

Values and attitudes - The student is, after completion of the course, expected to be able to:

* Choose relevant evaluation methods for a given specific computer system and context.
* Choose style of interaction and interaction device for a given user group adjusted for their tasks and situation.
* Argue for different solutions to a usability problem.
* Discuss pros and cons with an interactive computer system from the point of view of different user groups.
* Apply general theoretical concepts to concrete interfaces.
* Learning and Teaching Methodologies: Lectures, discussions, seminars, tutorials and consultations.
* Instructional Material and/or Equipment: Audio Visual Equipment, Computers, writing boards, writing materials, projectors etc

**Examinations**

* The University and Faculty of Science examinations regulations shall apply
* The University Common Rules and Regulations for undergraduate Examinations shall apply.
* Examinations shall be held at the end of the semester in which courses are taught
* Admission to Examination will depend on satisfactory attendance of the prescribed courses as per senate regulations.
* Continuous assessment tests and projects, account for 40% and, the final three-hour written examination will account for 60% of the final grade.

**Course outline**

Week 2/3: Introduction

* Introduction: the development of HCI
* the human, the computer, and the interaction
* cognitive load and usability
* auditory and tactile interfaces

Week 4: Principles, Rules and Interface/interaction design process

* Principles of HCI design
* Intelligent User Interfaces
* Rules of Interface design
* Interaction design

Week 5: HCI in the software development process

* design rules,
* HCI implementation support: user analysis, task analysis
* Universal design, User support.
* International HCI standards

Week 6: User Interface evaluation techniques

* Introduction to user interface evaluation
* Summative evaluation
* Formative evaluation
* Universality of design

Week 7 cat 1

Week 8/9 Interface design practice:

* Introduction to UI tools
* Evaluation of interface design tools
* Design and implementation of an interface using tools such as Dreamweaver, Visual Basic/Access etc.

Week 10/11 HCI Models and theories:

* Cognitive models, socio-organization concepts,
* communication and collaboration models, task analysis,
* Dialog notation and design, interaction modeling.

Week 12 cat 2 and Takeaway Assignment

Week 13: Revision

Week 14/15 end of semester Exams

**Recommended references**

Bailey, Robert W. (1989); Human Performance Engineering: Using Human Factors/Ergonomics to Achieve Computer System Usability (2nd Ed); Prentice Hall, New Jersey

Buxton, W. (1990). A three state model of graphical input. In D. Diaper et al. (Eds), *Human-Computer Interaction - INTERACT '90.* Amsterdam: Elsevier Science Publishers B.V. (North-Holland), 449-456.

Dix, Alan; Finlay, Janet; Abowd, Gregory D.; Beale, Russell (2004); Human–Computer Interaction, 3rd Edition, © Prentice-Hall Europe Pearson Education Limited, Edinburgh Gate, Harlow Essex CM20 2JE, England

Kendall, Kenneth E. & Kendall, Julie E. (2008); Systems Analysis & Design; Pearson International Edition

Lauesen, Soren (2005), User Interface Design: A Software Engineering; Perspective Pearson Education Limited; Harlow, England

Norman Don (2002); The Design of Everyday Things, Northbrook, Illinois

Ripple, Richard E.; Biehler, Robert F.; Jaquish, Gail A.; Human Computer Interaction, ISBN: 8472081680

Sanders, Mark S. & McCormick, Ernest J. (1992); Human Factors in Engineering Design; McGraw-Hill International

Somerville, Ian (2011); Software Engineering (9th Ed); Pearson Education, Inc.

**Prepared by: Approved for issue:**

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Jairus Odawa, Course Lecturer Chairman of Department: