IT3405: User Interface Design (UID)
(Compulsory)

INTRODUCTION:

A key component to the discipline of Information Technology is the understanding and the advocacy of the user in the development of IT applications and systems. IT graduates must develop a mind-set that recognizes the importance of users and organizational contexts. They must employ user-centered methodologies in the development, evaluation, and deployment of IT applications and systems.

In the course, the student is supposed to understand the role of user in the development of Information Technology (IT) applications/systems with respect to user interface (UI) which facilitates the interaction. The student is supposed to recognize the importance of users and organizational contexts. They must employ user-centered methodologies in the development, evaluation, and deployment of IT applications and systems. Hence, this course covers areas such as human factors, ergonomics, user-centered design, task analysis, usability and accessibility, user task analysis, required for an Information Technology degree programme.

CREDITS: 03

LEARNING OUTCOMES:

After following this course, the student will be able to identify the importance of developing effective user interface according to usability requirements and principles. At the same time, he/she will be able to understand the human cognitive situation and how such users could be accommodated with the evolution in technology. It is expected the student will be able to develop prototype interface together help/user documentation and to carry out an evaluation.

This course will cover the minimum requirements of knowledge and skill required to software developer who may want to develop effective user interfaces.

MINOR MODIFICATIONS

When minor modifications are made to this syllabus, those will be reflected in the Virtual Learning Environment (VLE) and the latest version can be downloaded from the relevant course page of VLE. Please inform your suggestions and comments through the VLE. http://vle.bit.lk

ONLINE LEARNING MATERIALS AND ACTIVITIES

You can access all learning materials and this syllabus in the VLE: http://vle.bit.lk, if you are a registered student of BIT degree program. It is very important to participate in learning activities given in the VLE to learn this subject.

ONLINE ASSIGNMENTS

The assignments consist of two quizzes, assignment quiz 1 (It covers the first half of the syllabus) and assignment quiz 2 (It covers the second half of the syllabus). Maximum mark for a question is10, minimum mark for a question is 0 (irrespective of negative scores). Final assignment mark is

calculated considering 40% of assignment quiz 1 and 60% of assignment quiz 2. Pass mark for the online assignments in a course is 50. You are advised to do online assignments before the final exam of the course. It is compulsory to pass all online assignments to partially qualify to obtain year 2 certificate.

FINAL EXAMINATION

Final exam of the course will be held at the end of the semester. Each course in the semester 3 is evaluated using a two hour question paper which consists of 20-25 MCQs and 3-4 structured questions based on a given case study.

OUTLINE OF THE SYLLABUS

Topic	Minimum number of hours
1. Introduction to Human-Computer Interaction	04
2. Understanding the Human user	06
3. Evolving technologies for rich interaction	06
4. Interaction Modeling and Design	06
5. PACT Analysis	02
6. User Centered Design	06
7. Usability and Accessibility	06
8. Task Analysis	03
9. Developing effective prototype interfaces	04
10. User Support	02
Total hours	**45**

REQUIRED MATERIALS

1. Human-Computer Interaction, Alan Dix - Janet Finlay - Gregory Abowd- Russell Beale, 3rd Edition, PRENTICE HALL (www.hcibook.com/e3)
2. Designing Interactive Systems, David Benyon, 2nd Edition or 3rd Edition, Pearson, (http://www.pearsoned.co.uk/HigherEducation/Titlesby/Benyonetal/)

DETAIL SYLLABUS

1. Introduction to Human-Computer Interaction (HCI) (4 Hours)

   Intended Learning outcomes:

   - Identify the importance of human-computer interaction for the success of a software product
   - Recognize components of HCI and describe its underline model
   - Describe the evolution of HCI from past to present

   1.1. Importance of Human-Computer Interaction
   1.2. Components of HCI Model
   1.3. What is Interface?
   1.4. Risk of Poor User Interface
   1.5. Developing Interaction
   1.6. HCI as a discipline and its short history

2. Understanding the Human User (8 hours)

   Intended Learning Outcomes:

   - Recognize how human communicates through different channels and reactions with a computer
   - Identify how information is stored and processed in human memory
   - Describe human thinking process to solve problems
   - Analyze a given user populations with respect to different their abilities and characteristics when using computers
   - Explain human capabilities and limitations that have direct impact on the interface design

   2.1.Different Channels and how human process data
      i. Visual
      ii. Auditory
      iii. Haptic
      iv. Movement

   2.2.Human Memory Management
      i. Sensory Memory
      ii. Short Term Memory
      iii. Long Term Memory

   2.3. Human Thinking and Problem solving
   2.4. Human errors when using computers
   2.5. Types of Users

3. Evolving Technologies for Rich Interaction

Intended Learning outcomes:

- Define the rich interaction between humans and computing machines
- Describe the role of technology for text, audio and video based input and output
- Identify different features of pointing and touch interfaces
- Explain the evolution of computing power towards natural interaction

3.1. What is rich interaction
3.2. Text based input and out devices and systems
3.3. Pointing and touch sensitive devices
3.4. Voice based input and out devices and systems
3.5. Multimodal and natural interaction
3.6. Gesture based interaction
3.7.Effect of computing power for HCI

4. Interaction Modeling and Design

Intended learning outcomes:

- Describe how two gulfs interaction affect the human error in HCI
- Identify the importance of ergonomics to minimize bad effects
- Describe different interaction styles and paradigms
- Describe WIMP components in GUI design

4.1. Interaction Model
4.2. Two gulfs in the interaction
4.3. Human Error
4.4. Ergonomics
4.5. Interaction Styles
4.6. WIMP Components for Interaction

5. PACT Analysis

Intended learning outcomes

- Identify the importance of PACT framework
- Describe the relationships among people, activities, context and technologies

5.1. PACT Framework for design feasibility
5.2. PACT component
   i. People
   ii. Activities
   iii. Context
   iv. Technologies

6. User Centered Design

Intended learning outcomes:

- Define the user centered design and its component
- Describe the role of human user in UCD
- Identify the importance of mental model and user behavior
- Use persona and scenario in UCD

6.1. Importance of User Centered Design (UCD) and Usability
6.2. Golden rules of Design
6.3. Process of UCD
6.4. Mental Model and User Behaviour
6.5. Persona and Scenario

7. Usability and Accessibility
   Intended learning outcome:
   - Define the usability, accessibility and acceptability
   - Recognize the importance of usability and accessibility
   - Describe acceptability model of a software product
   - Identify the legal and ethical requirement in usability and accessibility
   - Understand the general guidelines and principles applied in usability

   7.1. Defining usability and its importance
   7.2. 5Es in Usability and Benefits
   7.3. Human Interaction and Usability
   7.4. Accessibility and standards
   7.5. Acceptability
   7.6. General guidelines and principles

8. Task Analysis

   Intended learning outcomes:
   - Recognize the importance of task analysis for the design
   - Identify the differences among goal, tasks and actions
   - Carry out the hierarchical task analysis for a given description

   8.1. Importance of task analysis
   8.2. Goals, Tasks and Actions
   8.3. Different Methods
   8.4. Designing the menu structure

9. Developing Effective Prototype Interfaces

   Learning outcomes
   - Identify the importance of prototyping for acceptable design
   - Describe different prototypes and cost required to develop them
   - Learn the steps in paper prototyping
   - Use a tool to develop a prototype for a given description

   9.1 Overview of prototyping
   9.2 Types of prototyping
   9.3 Paper prototyping
   9.4 Tools for prototyping
   9.5 Developing a working prototype

10. User Support

    Intended learning outcomes
    - Recognize the importance of user support system
    - Describe different user supports and their features
    - Learn the steps in developing a help manual

    10.1 Types of user supports
    10.2 Features of user supports
    10.3 Interactive user supports
    10.4 Writing help manual