

## Usability Engineering

### **Objective:**

*Usability is a key area in modern engineering design. It is about designing systems and artifacts that are easy to use. It considers perceptual and cognitive abilities of the users, their biases and habits, environmental and contextual factors, cultural and social norms, and so on, to design a product that can be used naturally without having to think about it. It studies various factors that affect user interaction — whether a website, software application, mobile device, robotic system, or any other user-operated product — and how to incorporate them in the design from the very beginning.*

*This course is designed to give an overview of various methodologies for user-centered design with focus on cognitive science and techniques for conducting usability testing (evaluation techniques). The course will give students an overall understanding of the field and would make them realize that usability is not a luxury but a fundamental requirement of any interactive software or any other interface. They will also acquire some hands-on experience with usability testing and evaluation.*

*The course will be based on lectures, reading research papers, discussions, dealing with practical design problems and doing small projects.*

### **Course Outline:**

- Introduction and Motivation (1 lecture)
- Basics of Human Computer Interface Design (2 lectures)
- User-Centered Design Process and methodologies (3 lectures)
- Basic principles of Visual Design (3 lectures)
- Usability testing (2 lectures)
- Usability and accessibility (3 lectures)

### **Lab Work:**

There will be laboratory work evaluating and comparing usability of various kinds of systems. Though we will focus largely on software systems, we will also consider usability of other artifacts and systems as well.

### **Suggested Readings:**

- C. Barnum (2002). *Usability testing and research*. Longman.
- Steve Krug (2005). *Don't make me think: A commonsense approach to web usability*. 2nd ed.
- Deborah J. Mayhew (1999). *The usability engineering life cycle*. San Francisco: Morgan Kaufman.
- Jakob Nielsen (1993). *Usability engineering*. Academic Press.
- Donald A. Norman (1990). *The design of everyday things*. Doubleday.
- Donald A. Norman(2004). *Emotional Design*.
- Henry Petroski (2008). *Success through failure*.
- Henry Petroski (1994). *The evolution of useful things*.
- K. Vredenburg, S. Isensee & C. Righi (2002). *User-centered design: An integrated approach*. Printice hall.