ALLQ 3214: COMPUTER INTERACTIONS AND INFORMATION SECURITY

Lecture Hours: 39

Purpose:

The course introduces students to the theory and applications of human computer interaction (HCI). Students should achieve an understanding of human perception and psychology related to HCI, concepts and methods of interactive systems as well as information security concepts and threats. It demonstrates an understanding of the design of interfaces that facilitates the use of computers and other personal electronic devices such as handheld devices. Theory and practice of usability is emphasized. This course also provides an introduction to the various technical and administrative aspects of information security and assurance. This course provides the foundation for understanding the key issues associated with protecting information assets, determining the levels of protection and response to security incidents, and designing a consistent, reasonable information security system, with appropriate intrusion detection and reporting features

Learning Outcomes:

At the end of this course unit, the learner should be able to:

- Appreciate the importance of the user interface in software development.
- Understand key aspects of human psychology which can determine user actions at and satisfaction of the interface.
- Describe the key design principles for user interfaces.
- Set up and carry out a process to gather requirements for, engage in iterative design of, and evaluate the usability of a user interface.
- Identify key design errors in simple interfaces and suggest alternative designs.
- Discuss ethical issues involved in testing user interfaces.
- Define information security and outline its major components.
- Identify the major types of threats to information security and the associated attacks.
- Develop strategies to protect organization information assets from common attacks.
- Understand how security policies, standards and practices are developed

- Understand the role of management in enforcing security policies, standards and practices.

Course Content

Concepts of human-computer interaction, development of interfaces, graphic user interfaces. Human performance and measurement. Perception skill learning, hardware and software design, attention and fatigue, measurement factors, recommendation for design, category of users, style of interaction and their design. Help mechanism, designing graphic objects as resources, incorporating object in programs. Dialogue design, task analysis and ergonomics. Methods of measuring performance of user interfaces. Information security and insecurity. Need for information security, Basic ideas and relations within the field of information security Encryption, internet security, safety measures and practical implementation. Threats to the security of information systems, levels of training and expertise needed in organizations to reach and maintain a state of acceptable security. Concepts and applications of system and data security: Introduction to confidentiality, integrity, availability; authentication technologies and models; controls and protection models; security kernels; secure programming; information audit.

Course syllabus and plan

TIME	CONTENT
Week 1	**INTRODUCTION** • Definition of terms • Understanding Human Computer Interaction
Week 2	**ELEMENTS OF HUMAN-GRAPHICAL USER INTERFACE** • Overview on Human-Graphical User Interface Interaction • Graphical User Interface • Evolution of Graphical User Interface • Interpretations on Human-Graphical User Interaction
Week 3	• Human Cognitive Skills • Human Senses • Gestalt Theories • Effective Color Usage • Diversity of Human Cognitive Skills

	• Interaction Styles
Week 4	**FUNDAMENTALS ON DESIGN PROCESS OF GRAPHICAL USER INTERFACE** Design Considerations Concepts of Graphical User Interface Design a. Learnability vs. Usability b. Metaphors and Idioms c. Intuitiveness d. Consistency e. Simplicity f. Prevention g. Forgiveness h. Aesthetics Phases of Design Process Standards for Human Computer Interaction Future Trends Methods of measuring performance of user interfaces
Week 5	**CAT**
Week 6	**Information security and Insecurity** • Need for information security
Week 7	• Need for information security
Week 8	**Basic ideas and relations within the field of information security** • Encryption • internet security • safety measures and practical implementation
Week 9	**Threats to the security of information systems**, • Concepts and applications of system and data security
Week 10	**CAT**
Week 11	**Introduction to**: • Confidentiality • Integrity • Availability • Authentication technologies and models; controls and protection models; security kernels; secure programming; audit
Week 12	Revision

Learning and Teaching Methodologies

Lectures, tutorials, Practical sessions

Assessment

Type	Weighting (%)
End Semester Examination	70%
Continuous Assessment Tests	30%
Total	100%

Core Text

1. Readings in Human-Computer Interaction: Toward the Year 2000, Second Edition Ronald M. Baecker, Jonathan Grudin, William A.S. Buxtin, Saul Greenberg
2. A. Kerren, A. Ebert, J. Meyer: Human-Centered Visualization Environments. Springer 2007, ISBN 978-3540719489
3. J. Maeda: The Laws of Simplicity. MIT Press 2006, ISBN 978-0262134729
4. A. Dix, J. Finlay, G.D. Abowd, R. Beale: Human-Computer Interaction. Third Edition, Prentice Hall 2003, ISBN 978-0130461094
5. B. Buxton: Sketching User Experience. Morgan Kaufmann 2007, ISBN 978-0123740373
6.

References

1. Y.D. Chen et al., "Early Experiences and Challenges in Building and Using a Scalable Display Wall System," *IEEE Computer Graphics & Applications*, vol. 20, no. 4, July/Aug. 2000, pp. 671–680.
2. J. Rekimoto, "Pick-and-Drop: A Direct Manipulation Technique for Multiple Computer Environments," *Proc. ACM Symp. User Interface Software and Technology* (UIST 97), ACM Press, New York, 1997, pp. 31–39.
3. B. Nardi, ed., *Context and Consciousness: Activity Theory and Human-Computer Interaction*, MIT Press, Cambridge, Mass., 1996.
4. L. Suchman, *Plans and Situated Actions. The Problem of Human-Machine Communication*, Cambridge Univ. Press, Cambridge, 1987.

5. W. Gaver and A. Dunne, “Projected Realities: Conceptual Design for Cultural Effect,” *Proc. 1999 ACM Conf. Human Factors in Computing Systems* (CHI 99), ACM Press, New York, 1999, pp. 600–607.
6. Philips Corporate Design, *Vision of the Future*, 1996; www.design.philips.com/vof.