



Mehran University of Engineering and Technology, Jamshoro
Department of Software Engineering

ORIGINAL SUBMITTED SYLLABUS

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|-------------------------------|---|--|--------------------|
| Title of Subject | : | Affective Computing | |
| Code | : | SE808 | |
| Discipline | : | Software Engineering | |
| Effective | : | 24 PhDSE Batch and onwards | |
| Assessment | : | 10% Sessional 30% Mid Semester 60% Final Examination | |
| Credit Hours | : | 3 + 0 | Marks : 100 |
| Minimum Contact Hours: | | 42 | |

Objectives of the course:

This course aims to introduce students to the field of Affective Computing and provide them with in-depth knowledge of developing technologies that can recognize, interpret, simulate, and respond to human affects, emotions, and other aspects of human sentience.

After completion of this course, the students should be able to:

1. Understand the conceptual foundations of Affective Computing including its relations to psychology, neuroscience, and human-computer interaction.
2. Discuss the core techniques used in Affective Computing including artificial intelligence, social signal processing, and human-machine interaction.
3. Evaluate the ethical implications of Affective Computing technologies.
4. Develop expertise in a specialized subtopic within affective computing through an independent research project.

Course outline:

- **Introduction**
What is affective computing? History and goals; Applications and challenges
- **Artificial intelligence for emotion recognition**
Machine learning methods for emotion recognition from text, speech, and images; Deep learning approaches using CNNs, RNNs, and hybrid models; Challenges and recent advances.
- **Social signal processing**
Multimodal emotion recognition from facial expressions, gestures, and body language; Modeling social interactions and group dynamics; Continuous affect recognition in real-world situations.



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- **Human-computer interaction**
Designing affective user interfaces and interactive systems; Measuring user experience and technology adoption; Adaptive and personalized affect-aware systems.
- **Data analysis and inference statistics**
Hypothesis testing, Significance level, and p-value, type-I and type-II error, Performing hypothesis testing, t-test and t-distribution, proportion testing, important p-z pairs.
- **Ethics**
Bias and fairness in affective AI systems; Transparency, accountability, and explainability; Responsible use of affect data; Social and economic implications.
- **Case study**
Emotion modeling and simulation; Affective robotics; Applications in health, education, and business.

BOOKS RECOMMENDED

1. Rosalind W. Picard, Affective Computing. Publisher: The MIT Press, USA, Latest Edition.
2. Didem Gokcay and Gulsen Yildirim, Affective Computing and Interaction: Psychological, Cognitive and Neuroscientific Perspectives. Publisher: Information Science Reference (an imprint of IGI Global), USA, Latest Edition.

Reference Papers:

1. Key research publications on the field as recommended by the instructor.

Approval:

Board of Studies:
Board of Faculty:
AS&RB
Academic Council:

Resolution No. 2.2
Resolution No. 21.10
Resolution No.
Resolution No.

Dated: 21-07-2023
Dated: 07-12-2023