

EE6424

DIGITAL AUDIO SIGNAL PROCESSING

Acad Unit: 3
Pre-requisite: Nil
Effective: Academic Year 2013-2014
Last update: January 2013

LEARNING OBJECTIVE

Speech and audio are the most natural means of human communication. With the rapid advancement of technology, digital processing of speech and audio signals is becoming more popular. The first objective of this course will be to enable the students to understand how sound is perceived and the other objectives will be learning how various signal processing techniques can be applied to compress, enhance and recognize digital audio and speech signals.

CONTENT

Psychology of Hearing. Principles of Digital Audio. Audio Processing and Synthesis. Digital Audio Compression. Characteristics of Speech Signals. Speech Enhancement. Vector Quantization. Linear Predictive Coding (LPC). Speech Recognition.

LAB DESCRIPTION (if applicable)

Nil

LEARNING OUTCOME

Upon completion of the course, the students should have a basic knowledge of the various signal processing techniques taught so that they can contribute positively to research organizations or companies in the fields of telecommunication, signal processing and information technology.

STUDENT ASSESSMENT

Continuous Assessment	20%
Final Examination	80%

TEXTBOOKS

1. J. Watkinson, The Art of Digital Audio, 3rd Edition, Focal Press, 2000.
2. Ben Gold, Nelson Morgan, Dan Ellis, Speech and Audio Signal Processing, 2nd Edition, John Wiley & Sons, 2011.
3. Ian McLoughlin, Applied Speech and Audio Processing: With Matlab Examples, Cambridge University Press, 2009.

REFERENCES

1. Andreas Spanias, Ted Painter, Venkatraman Atti, Audio Signal Processing and Coding, John Wiley & Sons, 2006.
2. B. C. J. Moore, An Introduction to the Psychology of Hearing, Academic Press, 1989.
3. John R. Deller, John H.L. Hansen, John G. Proakis, Discrete-Time Processing of Speech Signals, IEEE Press, 2000.