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| **COURSE** | Name | : Multimedia Signal Processing |
| | Code | : EE185252 |
| | Credit(s) | : 3 |
| | Semester | : II |

**Description of Course**

This course studies the concept of signal processing for multimedia applications, continuous signals, digital signals, fourier transforms, FFT, discrete cosine transcription and multimedia compression.

**Learning Outcomes**

**Knowledge**

(P01) Mastering the concepts and principles of science in a comprehensive manner, and to develop procedures and strategies needed for the analysis and design of systems related to the field of power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics as a preparation for further education or professional career.

**Specific Skill**

(KK01) Being able to formulate engineering problems with new ideas for the development of technology in power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics.

**General Skill**

(KU11) Being able to implement information and communication technology in the context of execution of his/her work.

**Attitude**

(S09) Demonstrating attitude of responsibility on work in his/her field of expertise independently.

(S12) Working together to be able to make the most of his/her potential.

**Course Learning Outcomes**

**Knowledge**

Able to understand basic concepts and techniques in processing multimedia signals based on current multimedia technology standards.

**Specific Skill**

Able to explain multimedia signal processing principles based on multimedia technology today.

**General Skill**

Able to apply the knowledge to certain multimedia problems and projects.

**Attitude**

Demonstrating attitude of being responsible for the work in his area of expertise independently.

Working together to be able to make the most of their potential.

**Main Subjects**

1. Digital Signal Processing: Wave, Amplitude, Frequency and phase, Signal to Noise ratio, digital signal filter.
2. Fourier transform: Components of audio and video data frequency, frequency dominance, fourier theorem 1 D and 2D, magnitude, phase and time frequency representation.
3. Digital Filters: Low Pass Filters, High Pass Filters, Band-Pass Filters, Fourier Transforms and Convolutions.
4. Data Multimedia: Discrete and continuous media, analog / digital conversion, text, audio, graphics, images and video.
5. Compression algorithm: Shannon and Kolmogorov, Lossless and Loss Compression, Lossless compression algorithm, Repetitive Sequence Suppression, Run-Length Encoding, Pattern Substitution, Entropy Encoding, Shannon-Fano Algorithm, Huffman Coding, Arithmetic Coding

**Reference(s)**

[1] Alan C. Bovik, "Handbook of Image and Video Processing ", Academic Press, 2000
[2] Rafel C. Gonzalez, "Digital Image Processing", 3rd Ed., Pearson Education, 2008

**Prerequisite(s)**

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