**ABET Course Syllabus – CS4551**

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| **Code** | CS4551 | **Credits** | 3 |
| **Title** | Multimedia Software Systems | **Coordinator** | Eun-Young Kang |

**Course Information**

1. **Catalog Description:** Introduction to Multimedia Information and Processing. Topics: Basic Signal Processing. Color Space, Formations of Image, Video, and Audio data. Current standards and the state-of-art techniques for multimedia systems.
2. **Prerequisites:** CS 3112
3. **Contact Hours:** Lecture 3 hours
4. **Required/Elective:** This course is an elective in the BS program.

**Textbook**

Ze-Nian Li, Mark S Drew, Jiangchuan Liu, Fundamentals of Multimedia (2nd ed), Springer, 2014

**Course Goals**

The Student Learning Outcomes that are addressed by the course are:

*SLO #1. Students will be able to apply concepts and techniques from computing and mathematics to both theoretical and practical problems.*

*SLO #2. Students will be able to demonstrate fluency in at least one programming language and acquaintance with at least three more.*

*SLO #3. Students will have a strong foundation in the design, analysis, and application of many types of algorithms.*

*SLO #5. Students will have the training to analyze problems and identify and define the computing requirements appropriate to their solutions.*

*SLO #6. Students will have the training to design, implement, and evaluate large software systems working both individually and collaboratively.*

Other outcomes of instruction. At the end of the course, students are able to

1. Describe the current multimedia data types (images, video, audio, graphics etc).

2. Identify with the requirements and the algorithms for multimedia systems.

3. Implement efficient design solutions and established standards for multimedia.

4. Gain programming experiences in multimedia processing.

5. Develop a multimedia software system related to video (audio) codec, multimedia database, or other multimedia software application on network.

**Topics covered**

1. Introduction to Multimedia.

* Definition of multimedia
* Taxonomy of multimedia
* Issues and Applications

2. Digital Data Acquisition

* Basic signal processing
* Media formats

3. Coding Theory

* Need for compression
* Lossless and lossy compression techniques.

4. Image Compression Techniques and Standards

5. Color Theory

* Color problem, color response, TriStimulus vectors
* Color space
* Color quantization

6. Video Compression Techniques and Standards

* Modality of video
* Motion compensation
* Standards

7. Audio Compression Techniques and Standards

* Characteristics of sound and audio signals
* Sound compression techniques
* Audio compression standards

8. 2D/3D Graphics

* 3D model simplification
* 3D model compression

9. Recent compression technology