Track I: Computer Graphics and Multimedia

Course Number	Course Title	Credits Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
CSI 414	Digital Image Processing	3	2	2	MATH 310
CSI 424	Computer Vision	3	2	2	CSI 414
CSI 514	Interactive Computer Graphics	3	2	2	CSI 425
CSI 521	Multimedia Technology	3	2	2	CSI 425
CSI 530	Digital Photography	3	2	2	MATH 220

- **CSI 414 Digital Image Processing**

The current course aims to provide an introduction to basic concepts and methodologies for digital image processing in both theoretical and practical aspects. Therefore the course topics are selected to provide a good understanding and design principles for several effective techniques used for image enhancement and to provide the necessary knowledge for further study in Computer Vision, Scientific Visualization and Image Pattern Recognition. These topics are: Introduction: Image Models, Image Acquisitions and digitization, Terminologies - Image Transformations: Manipulation & Processing by (Fourier, Discrete Cosine, Hoteling, Wavelet transforms) - Image Enhancement: Spatial & Frequency Domain Filters methods - Image Compression methods and Restoration - Image Segmentation

- **CSI 424 Computer Vision**

This course covers fundamental topics in computer vision. The course will provide an introduction to image formation, image processing, feature detection, segmentation, multiple view geometry and 3D reconstruction, motion, face detection, object recognition and classification. As such, after completing this course, students: learn the basics of computer vision and some of the state-of-the-art techniques. They will be able to write programs that can perform image segmentation, image matching, object detection or recognition, and applications such as content-based image retrieval or construction of panoramas. Upon completion of the course they should be able to take an internship or job with a vision company or research lab doing vision or to participate in undergraduate research leading to potential graduate level research.

- **CSI 514 Interactive Computer Graphics**

The current course aims to provide an introduction to basic concepts and methodologies for digital image processing in both theoretical and practical aspects. Therefore the course topics are selected to provide a good understanding and design principles for several effective techniques used for image enhancement and to provide the necessary knowledge for further study in Computer Vision, Scientific Visualization and Image Pattern Recognition. These topics are: Introduction: Image Models, Image Acquisitions and digitization, Terminologies - Image Transformations: Manipulation & Processing by (Fourier, Discrete Cosine, Hoteling, Wavelet transforms) - Image Enhancement:

Spatial & Frequency Domain Filters methods - Image Compression methods and Restoration - Image Segmentation

- **CSI 521 Multimedia Technology**

The creation of interactive multimedia products for cross-platform delivery - Introduction to Multimedia Authoring and Production - The Multimedia Development Process - Introduction to Multimedia Scripting - Types of Lingo Scripts / Behaviors / Handlers - The Sampling Process: Understanding Audio / Video - Using Lists and Casts - Understanding Programming Structures - Human Computer Interface Design - Graphics, Audio, and Movie File Formats - Databases, Lists, and Shockwave - Storage and Delivery Technologies - Global Development Issues - Legal Issues, Copyrights, Taxes.

- **CSI 530 Digital Photography**

This course is intended to introduce students to the basic concerns in digital photography *as a fine art medium*, and the computer as a darkroom. Includes digital imaging techniques of scanning, colour correction, retouching, composition, content and more. Hardware, image input and output processes, and software are also discussed as such. After completing this course, the student should demonstrate a basic knowledge of fundamental digital photographic theory and make images which correspond to basic photographic design and communication principles. Students will also demonstrate proficiency in the use of image manipulation software and digital imaging applications in addition to utilizing major computer hardware components and accessories, including scanners, printers, CD recorders and storage devices while managing the colour digital workflow through all production stages from image capture to final output. Students will also be able to demonstrate an awareness of contemporary aesthetic, legal and ethical considerations in digital imaging.