

Course Syllabus

DIGITAL IMAGE PROCESSING

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Program: Computer Science

1. Course number and name

CCPG1021 - DIGITAL IMAGE PROCESSING

2. Credits and contact hours

3 credits and 3 contact hours

3. Instructor's course or coordinator's name

BORIS XAVIER VINTIMILLA BURGOS

4. Text book, title, author, and year

- Umbaugh, Scott E.. Digital Image Processing and Analysis: Applications with MATLAB® and CVIPtools, Third Edition (3rd Edition)

- a. Other supplemental materials

- Rafael C. Gonzalez, Richard E. Woods. Digital image processing (4ta Edición)

5. Specific course information

- a. Brief description of the content of the course (catalog description)

This course deals with the theoretical foundations and practical tools on the field of digital image processing and analysis. Topics related to the image acquisition process, lighting systems, camera types, optics and camera calibration processes are treated in the initial part of the course. Additionally, we review basic techniques and tools used in image processing applications, such as: preprocessing operators, discrete transformations, enhancement, restoration, segmentation and image compression. It contributes to the ability to analyze and solve problems proposed by applying image processing techniques within the topics studied throughout the course.

- b. This course is: Selected elective

6. Specific goals for the course

- a. Specific outcomes of instruction

- 1.- Apply concepts of digital processing for the analysis of images using open source libraries in different operating systems.

- 2.- Analyze problems related to digital image processing by identifying the possible operators, filters, techniques and algorithms required to solve problems and establishing the necessary criteria for their respective validation.

- 3.- Develop components using computational tools that serve the development of multimedia systems.

- 4.- Use algorithms, languages and current tools for image processing.

- b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course



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7. Brief list of topics to be covered

- 1.- Introduction to Digital Image Processing (DIP) and Computer Vision (CV)
- 2.- Acquisition and representation of images
- 3.- Preprocessing operators
- 4.- Discrete transformations
- 5.- Image enhancement
- 6.- Image restoration
- 7.- Image segmentation
- 8.- Image compression