INSTITUTE	**FACULTY OF TECHNOLOGY**
PROGRAM	**BACHELOR OF TECHNOLOGY (CIVIL ENGINEERING)**
SEMESTER	**7**
COURSE TITLE	**DIGITAL PHOTOGRAMMETRY & IMAGE PROCESSING**
COURSE CODE	**01CI0728**
COURSE CREDITS	**3**

Objective:

1 Introduces students to the principles and techniques of digital photogrammetry. and image processing
2 Introduces students to the principles and techniques of digital image processing
3 Students will gain practical experience through hands-on exercises using standard software
4 To develop skills in image processing and analysis for various applications

Course Outcomes: After completion of this course, student will be able to:

1 Identify the fundamentals of digital photogrammetry and image processing
2 Discuss various techniques for image acquisition and preprocessing.
3 Develop skills in image rectification and geometric modeling
4 Extend different methods for photogrammetric reconstruction

Pre-requisite of course: Basics Knowledge of Remote Sensing

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	0	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**Introduction to Digital Photogrammetry** Types of foundation, Definition and principles of photogrammetry, Types of photogrammetry: aerial, close-range, satellite, methods of Cameras and image acquisition techniques, Stereoscopic vision and depth perception	8
2	**Digital Image Processing Basics** Image enhancement techniques: contrast stretching, histogram equalization, Filtering: spatial and frequency domain filtering, Noise reduction techniques	8
3	**Geometric Modeling and Camera** Geometric principles in photogrammetry, Camera models: pinhole, perspective, fisheye, piles Intrinsic and extrinsic camera parameters, Camera calibration techniques	6

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Contents : Unit	Topics	Contact Hours
4	**Feature Extraction and Matching** Feature detection and description, Applications in image registration and stereo vision, Accuracy assessment of feature matching	6
5	**Advanced Topics and Applications** Multi-view geometry, Photogrammetric applications in various domains: archaeology, forestry, urban planning, Emerging trends in photogrammetry and image processing	6
6	**Project Work and Evaluation** Hands-on projects applying photogrammetric techniques, Data collection, processing, and analysis, Presentation and evaluation of project results, Final assessment and review	8
Total Hours		**42**

Textbook :

1 Introduction to Digital Image Processing, Rafael C. Gonzalez and Richard E. Woods, Rafael C. Gonzalez and Richard E. Woods, 2005

References:

1 Digital Photogrammetry: A Practical Course, Digital Photogrammetry: A Practical Course, Wilfried Linder, Wilfried Linder, 2006

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
5.00	10.00	30.00	30.00	15.00	10.00

Instructional Method:

1 Prerequisite of the course and its pattern shall be discussed on the commencement of the course

2 Lectures shall be conducted in class room using various teaching aids.

3 Presence in all academic sessions is mandatory which shall carry 5% marks of the total internal evaluation

4 At the end of each unit/topic an assignment based on the course content shall be given to the students which shall carry 5% weightage for timely completion and submission of the assigned work

Supplementary Resources:

1. https://www.youtube.com/watch?v=2kvT93QlFto&list=PLX17kXRvcmbEYwA1ZGlqHDCMXhkYjR2Rk
2. https://www.youtube.com/watch?v=ZNKOWP8qAMY&list=PL8ZbncaV3f_anQs_DoyKUxmNDApxM0HT8
3. https://www.youtube.com/watch?v=vs4KSiwDO1M&list=PLpgQWSI_ty3YIvugFyVI4d8wl21pbETcb

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