



AMRITA NAGAR POST, ETTIMADAI, COIMBATORE 641 112

AMRITA/UO/2024/125

April 22, 2024

OFFICE ORDER

Sub: Approval of Ph.D Course

Based on approval from Dr. Bharat Jayaraman Dean, School of Computing, Amritapuri, **“Satellite Image Processing”** is approved as PhD level course. The order will have immediate effect and to be implemented from ongoing semester. The syllabus is attached.

REGISTRAR

Encl: Syllabus for the course

To:

1. Dr. Bharat Jayaraman Dean, School of Computing, Amritapuri
2. Dr. Prema Nedungadi, Associate Dean School of Computing, Amritapuri
3. Dr. Vidhya Balasubramanian, Principal, School of Computing, Coimbatore
4. Dr. Sriram Devanathan, The Principal (additional charge), School of Computing, Bangalore
5. Dr. V. Jayakumar, The Principal (additional charge), School of Computing, Chennai
6. Dr. Rajathilagam B., Principal, Amrita School of Computing, Amaravathi.
7. Dr. Krishnashree Achuthan, Dean PG Programmes

Copy to:

1. The Pro Chancellor
2. The Vice-Chancellor
3. The Controller of Examinations
4. AUMS ADMIN
5. Office of Dean PG, Coimbatore

Course Description:

Satellite Image Processing is a comprehensive course designed to provide students with the necessary knowledge and skills to analyze, manipulate, and interpret satellite imagery effectively. With the increasing availability of satellite data, there is a growing demand for professionals who can extract valuable information from these vast datasets for various applications including environmental monitoring, urban planning, agriculture, disaster management, and more.

Course Outcomes:

1. Understand the principles of satellite remote sensing and its applications.
2. Apply satellite image pre-processing techniques.
3. Develop skills in image enhancement and feature extraction from satellite imagery.
4. Demonstrate proficiency in interpreting and analyzing satellite imagery for environmental studies.

Syllabus

Module 1: Introduction to Satellite Remote Sensing: Basics of remote sensing- Types of satellites and sensors- Applications of satellite remote sensing. Image Acquisition and Pre-processing: Image acquisition process - geometric correction, Radiometric correction, Atmospheric correction- EM spectrum, solar reflection, and thermal emission remote sensing.

Module 2: Feature Extraction- Color representations and transforms-Image Histograms and statistics-Texture analysis - Shape analysis. Image Enhancement: Spatial enhancement, Spectral enhancement, Temporal enhancement techniques.

Module 3: Image interpretation: Spectral Indices-Visual interpretation techniques. Multispectral image analysis. Image merging and mosaicking techniques. Image Classification: Supervised and Unsupervised classification methods - Object-based classification.

Course type: Theory

Evaluation: 50:50

Evaluation Pattern

1. Continuous Assessment – 20 marks (assignments – 10 marks, paper reading and presentation +viva – 10 marks)
2. Internal examinations – 30 marks (15 marks for each internal examination)
3. End Semester – 50 marks (theory)

Books and references

1. Introduction to Remote Sensing, Sixth Edition By James B. Campbell, Randolph H. Wynne, Valerie A. Thomas Copyright 2022
2. Introduction to Satellite Remote Sensing Atmosphere, Ocean, Land and Cryosphere Applications 1st Edition - August 30, 2017, Authors: William Emery, Adriano Camps
3. Gonzalez, Rafael C. and Richard E. Woods “Digital Image Processing”, (4rd Edition) Pearson Education, London,2018
4. Fundamentals of Remote Sensing, George Joseph and C Jeganathan, Universities Press,2018
5. Lillesand, T.M., Kiefer, R.W. and Chapman, J.W., “Remote Sensing and Image Interpretation”, (7th Ed.), John Wiley & Sons, 2015.