National Institute of Technical Teachers' Training and Research, Bhopal

PROGRAMME BRIEF

- **Title of the Programme:** - **Digital Signals and Image Processing**
- **Programme code: - EEE-08**
- **Programme duration:- 10th to 14th July 2023**
- **Venue:- DEEEE, NITTTR Bhopal**

1. **Rational**

   Processing signals in the digital domain is very easy and convenient compared to processing the signal in the analog domain. Once the signal is converted into the digital domain it can be easily processed (like compression, coding for security and privacy, error detection and correction, feature extraction, and also watermarked), store and transfer very efficiently from one place to another. Digital Signal Processing (DSP) is the backbone of all the digit processing ICs and embedded systems. Image processing is one of the important application of DSP which focus on the extraction of relevant image features for enhancement, retrieval, fusion and recognition. The course is designed to provide a broad overview and comprehensive understanding of Digital Signal and image processing techniques and applications which are very much in demand by Industries and Research organizations.

2. **Outcomes**

The participants of the workshop will be able to:

- Create and analyse signals, performing spectral analysis
- Design and analyse various types of filters
- Explain the concept of multi rate and adaptive filter designing.
- Use MATLAB commands for basic Image processing steps.
- Implementation of Image Processing in MATLAB (very basic Applications)

3. **Programme Contents:-** DSP basics, types of signals and systems, sampling and quantization, aliasing, Convolution and correlation, interpolation, basic filter structures FIR and IIR structures, Basic transforms, filter designing and Analysis, multi-rate filter designing, adaptive filter designing using MATLAB, Introduction to Spatial Data Processing Methods and Applications for image

data, Introduction to Transform Domain Methods and Applications for image, Combined applications for Image Enhancement, denoising, registration, Retrieval and Fusion, Image Segmentation, Introduction to Pattern Recognition, Hands-on sessions in MATLAB

4. **Instructional Strategy:-** Interactive Lectures, Input-cum-Discussions, analogies, software-based assignments, Group discussion, Internet-based Syndicate work and presentation, and Industrial/Educational visit.

5. **Dates and Venue:- 10th to 14th July 2023**, Department of Electrical and Electronics Engineering Education NITTTR, Bhopal

6. **Target Group :-** Faculty of AICTE approved Degree/ Diploma level technical institutions, Government/aided/self-financed Polytechnic and Engineering faculty of relevant branch(Electronics, Electronics and Communication, Electronics and Telecommunication)

7. **Coordinator :-** Dr.(Mrs.) Anjali Ashish Potnis

8. Co coordinator ---NA-

9. **Tentative Schedule**

Day	Session 1	Session 2	Lunch	Session 3	Session 4
	10.00 AM-11.30 AM	11.45 AM - 13.15 PM	13.30 PM - 2.00 PM	2.15 PM - 3.45 PM	4.00 PM -5.30 PM
Day-1 Monday	Registration, Inauguration, Programme brief and Expectations from Participants	Course Overview		Basics of DSP Part-1	Basics of DSP Part-1
Day-2 Tuesday	FIR and IIR filter designing	Lab Session and Assignment		Image Processing Basics	Lab Session and Assignment
Day-3 Wednesday	Image Processing in Spatial Domain	Expert Lecture		Expert Lecture	Lab Session and Assignment
Day-4 Thursday	Image Processing in Transform Domain	Expert Lecture		Expert Lecture	Lab Session and Assignment
Day-5 Friday	Expert Lecture	Presentation from Participants		Achivement Test and Discussion	Summarization of learning, Feedback and Valedictory session