

# ONLINE Workshop on Machine Learning, Deep learning and Computational intelligence for wireless communication (with Illustrations using MATLAB)

## Module 2: 'MDCWC 2022'

Digital Signal Processing for Wireless Communication

13th June to 24th June 2022 (Duration: 6.00 to 9.00 P.M.)

### Topics covered

Mathematical model of Time varying wireless channel model: Coherence time, Doppler spread, Coherence frequency and Delay spread Rayleigh, Rician, kappa-mu, eta-mu model, Detection theory: Bayes, Mini-Max and Neyman-pearson technique Estimation theory: MMSE, MMAE and MAP technique, Mathematical model of base band transmission and its Spectral density computation. Relationship between Base and Band pass transmission. Computation of spectral density PSK,QPSK,FSK,MSK, Power Spectral estimation using periodogram, Barlett, Welch and the Blackman-Tuckey method, Multiple Input Multiple Output channel model and Massive MIMO, mmWave channel model Ray tracing model, Beam forming, NOMA, Spatial Modulation, OFDM, Water fill algorithm, Case studies on Machine learning algorithm in Wireless communication.

### About the course:

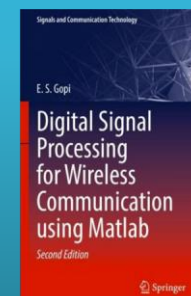
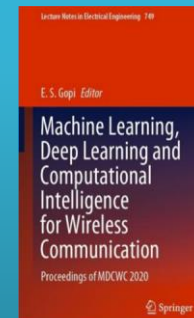
The course aims on strengthening the mathematical foundations involved in wireless communication, machine learning, deep learning and computational intelligence using illustrations using Matlab. Evening classes are offered to facilitate working professionals. Participants will also get the chance to get the paper published in the Machine Learning for wireless Communication with Simulation Illustrations, Signals and Communication Technology series, springer publications, Co-Edited by the event Co-ordinator [Link](#) (Papers will be subjected to regular Review process). Guest sessions on the state-to-the-art techniques will also be handled by Foreign and Indian experts on the related topics.

Course contents will be based on the book authored/edited by the co-ordinator: Digital Signal Processing For Wireless Communication Using Matlab ([Link](#)) And Machine Learning And Deep Learning And Computational Intelligence For Wireless Communication ([Link](#)).

#### Co-ordinator:

Dr. E.S. Gopi,  
Associate professor,  
Department of ECE  
[Link](#) to website:  
[MDCWC2022](#)

Last date for  
registration: **30th  
April 2022**(First  
Come First Served)



Maximum  
number of  
Registratio  
n = 30  
Online portal:  
Webex (Link  
will be shared  
for the  
registered  
participants)

Registration fee	Category	Module 2 (Including GST)
	UG,PG, Research scholars and Faculty	₹ 6000
	Industry participants	₹ 8000

## Tentative Schedule

13th June	Mathematical model of Time varying wireless channel model: Coherence time, Doppler spread, Coherence frequency and Delay spread Rayleigh, Rician, kappa-mu, eta-mu model
14th June	Illustrations: Case study using Flat Rayleigh fading model ,Flat Rician fading model, Rician fading model and with known channel coefficient
15th June	Detection theory: Bayes, Mini-Max and Neyman-pearson technique Estimation theory: MMSE, MMAE and MAP technique
16th June	Case study on Bayes, Mini-Max and Neyman-pearson techniques Case study on MMSE, MMAE and MAP techniques
17th June	Mathematical model of base band transmission and its spectral density computation. Relationship between Base and Band pass transmission. Computation of spectral density for PSK,QPSK,FSK,MSK,Power Spectral estimation using periodogram, Barlett, Welch and the Blackman-Tuckey method
20th June	Illustrations on the computation of Power Spectral density
21th June	Multiple Input Multiple Output channel model and Massive MIMO, mmWave channel model, Ray tracing model, Beam forming
22th June	NOMA,SpatialModulation,OFDM,Water fill algorithm
23th June	Illustrations on MIMO, Ray tracing model and Beam forming, NOMA, Spatial Modulation OFDM, Water fill algorithm
24th June	Machine learning algorithms in Wireless communication

### Target Audience:

UG, PG, Scholars, Faculty from Engineering colleges and universities and participants from Industry. Participants are strongly encouraged to have Matlab software installed in their system to execute the code described during the illustration session.

### Registration Details:

Step 1: Registration needs to be done through SBI i-collect: [Link for payment](#)

- Academia module I or II: Proceed->Select: State: Tamil Nadu, Institution: Educational Institutions->Select: CONFERENCE AND WORKSHOP NIT TRICHY- >MDCWC2022 ACADEMIA MODULE I or II.
- Industry module I or II: Proceed->Select: State: Tamil Nadu, Institution: Educational Institutions->Select: CONFERENCE AND WORKSHOP NIT TRICHY- >MDCWC2022 INDUSTRY MODULE I or II

Step2: Fill the Google form ([Link for Registration](#)) (Don't forget to upload the receipt generated from SBI i-collect in the Google form)

Step3: You will get an acknowledgement from mdcwc2022@gmail.com for final confirmation of the registration process.

Supporting team:

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