

Faculty Development Program on
Wireless and Mobile Communication
(Course offered by IIT Faculty with NIT Raipur as Remote Center)

About Winter Courses

Faculty Development Programmes in core areas of Electronics and Information & Communication Technology (ICT) streams have been planned by academies for delivery during winter. Wireless and Mobile Communication course will be delivered at **NIT Raipur** as remote centres through NKN infrastructure/video conferencing from IIT.

S. No	Course Name	Principal Coordinating - Academy	Co-principal Coordinating - Academy	From date	To date
1	Wireless and Mobile Communication	IIT Guwahati	NIT Patna	3.12.2018	07.12.2018

Target Beneficiaries:

Interested faculty of engineering/technical institutions are eligible to attend these winter course.

Course duration:

This winter course is designed for 40 hours (Theory Lectures: 20-25 hours, Hands-on/Design orientation/Activity linked problems/Assignments Problem Solving/Case Studies sessions/Quiz Tests: 15-20 hours)

Travel:

No Travel Allowance will be paid to the participants.

Registration Fee for each Winter Course:

No Registration fee is charged for attending this programme planned at any designated academies/Remote centres. However, candidate should submit a **refundable Demand Draft** of Rs.1000/- along with application form and the same will be handed over to the participant on the last day of the training. Satisfactory Certificate will be given to the participants subject to fulfilment of attending all sessions, submission of assignments and clearing the test(s).

Mode of Payment:

Academy Name	Payment through DD
IIT Guwahati	Demand Draft in favor of " Registrar, IIT Guwahati " Payable at Guwahati

How to apply:

- Please keep the following scan documents ready before registering (maximum size of file up to 1 MB):
 - 1) Scan copy of institutional ID (file name as "full name_id.pdf")
 - 2) Scan copy of Demand Draft, if applicable (file name as "full name_dd.pdf")

For Registration of the course go to the following link:

Under <http://eict.iitg.ac.in/UpcomingWinterCourses18.html>, in Wireless and Mobile Communication course there is a link of "Application Form(On-line)", it would take you to google doc where you can make necessary entries and upload the scanned documents.

- Address of Local coordinator:
Dr. Rakesh Tripathi, Assistant Professor, Dept of Information Technology, NIT Raipur.
E-mail: rtripathi,it@nitrr.ac.in, Mobile:9340105510

	Wireless and Mobile Communication (3-7, December 2018)
Last Date for Submission of Application form	26th November, 2018
Selection list Intimation by E-mail/Display in web site	28th November, 2018

Module Details of Wireless and Mobile Communication

S.No	Module Name	Topics
1.	Introduction and basics of Mobile radio propagation environment	<p>Evolution of mobile radio communication, Different generations of wireless communication and their specifications, Mobile radio propagation and wireless channel models-free space propagation, reflection, diffraction and scattering of radio signals, Doppler shift, Path loss and shadowing, Multipath propagation and impulse response model, Statistical fading models-Narrowband and wideband fading models, Different parameters of fading channels-rms delay spread and coherence bandwidth, Doppler spread and coherence time, Flat and frequency selective fading, Slow fading and fast fading, Level crossing rate (LCR) and Average fade duration (AFD), Link budget design.</p> <p>Hands-on: Path-loss and shadowing, Rayleigh and Rician fading, LCR and AFD</p>
2.	Cellular radio communication systems and Multiple access Techniques	<p>Cellular concept-Cellular system fundamental, frequency reuse, channel assignment, handoff, Interference and system capacity, Improving system capacity and cell coverage, Multiple access techniques-Frequency division multiple access (FDMA), Time division multiple access (TDMA), Code division multiple access (CDMA) and Space division multiple access (SDMA), Examples of practical cellular radio systems.</p> <p>Hands-on: Capacity of cellular systems with co-channel interference for varying cluster size.</p>
3.	Digital communication over fading channels, diversity equalization and channel coding	<p>Non-coherent and coherent reception; error probability of common modulation schemes for uncoded transmission, Receiver diversity-selection combining (SC), equal gain combining (EGC) and maximal ratio combining (MRC), Transmit diversity, Introduction to space-time codes, Linear and decision feedback equalizers, Linear block codes and convolution codes.</p> <p>Hands-on: Error probability of common modulation schemes in Rayleigh fading, SC and MRC, Zero forcing (ZF) and Minimum mean square error (MMSE) equalizer.</p>
4.	Spread spectrum, Multi-carrier and MIMO wireless systems	<p>Spread spectrum-Spread Spectrum Principles, Direct Sequence Spread Spectrum (DSSS) system Model, Processing gain, Spreading codes, Multiple access interference, Power control, Synchronization, Rake receiver, Multi-carrier system-Data Transmission using Multiple Carriers, Orthogonal Frequency Division Multiplexing (OFDM), Matrix Representation of OFDM, Peak to Average Power Ratio, Frequency and Timing Offset, Multiple Input Multiple Output (MIMO) wireless systems-Narrowband MIMO Model, parallel decomposition of MIMO channel, MIMO Channel Capacity for various conditions, Diversity-Multiplexing Trade-offs.</p> <p>Hands-on: Spread spectrum system, multiple access interference, OFDM systems-transmitter and receiver.</p>