

ONE WEEK MHRD GIAN  
course on

**Advanced Adjustable Speed AC Motor Drive Systems :  
Application Problems & Solutions**

(ASMDS-2k17)

15-19 May, 2017 @ NIT GOA

**Registration Form**

Please complete the details below and mail along with the registration fee.

1. GIAN portal Application Number \_\_\_\_\_

2. Name (Mr./Ms./Dr.) \_\_\_\_\_

3. Category: Academic/Industry/Student  
[For registration as student, please enclose a bonafide certificate from parent institution]

4. Organization: \_\_\_\_\_

5. Address: \_\_\_\_\_

6. Mobile No: \_\_\_\_\_

7. E-mail ID: \_\_\_\_\_

8. Highest Academic Qualification: \_\_\_\_\_

9. Bank Draft No.: \_\_\_\_\_ Dt: \_\_\_\_\_

10. Amount Rs. \_\_\_\_\_  
drawn on \_\_\_\_\_

11. Accommodation Required: Yes /No

Signature of the Candidate:

Signature of the Head of  
the Department/Institution

**Registration**

Application in the prescribed format duly sponsored by the Head of the Institution along with the registration fee in the form of a Demand Draft favouring "Director NIT GOA" payable at Corporation Bank Farmagudi, Ponda, Goa should reach the convener on or before 12th April 2017. The participation fees for taking the course are as follows:

Participants from abroad : US \$200  
Participants from Industry : Rs.5000/-  
Participants from Academic/Research Organizations :  
Rs . 4,000/-  
Students and full time research scholars:Rs.2000/- (For SC/ST students :  
Rs . 1,000/-)

The above fee includes all instructional materials, computer use for tutorials

Last date for receiving applications : 12th April 2017

Intimation to participants : 15th April 2017

Course Dates : 15-19 May 2017

**Registration Links**

<http://www.gian.iitkgp.ac.in/GREGN>

<http://www.nitgoa.ac.in/gian>

**How to Reach Us**

NIT Goa is located at Farmagudi, which is about 4 kms from Ponda city. Madgaon Railway Station is 25 kms south of Farmagudi while Karmali Railway Station is 18km north of Farmagudi. Goa's Dabolim International Airport is 36 kms west from Farmagudi. There are public and private bus services between Ponda and the major cities of Goa like Panaji, Madgaon, Vasco and Mapusa. For local transport, taxis, pilots and auto-rickshaws are also available.

**Boarding & Lodging**

Accommodation for the outstation participants may be arranged in the institute hostels on request, subject to availability.

**For more details please contact**

Co-ordinators - GIAN course ASMDS 2K17

**Dr. Suresh Mikkil**

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Registration  
Fee

Important  
Dates



**Gian**  
GLOBAL INITIATIVE OF ACADEMIC NETWORKS

GLOBAL INITIATIVE ON  
ACADEMIC NETWORK (GIAN)

**One Week Course on**

**Advanced Adjustable Speed AC Motor Drive Systems :  
Application Problems & Solutions**

**15 – 19 May 2017**

under the aegis of

**Government of India**



**Ministry of Human Resource Development**

organised by

Dept. of Electrical & Electronics Engineering

**National Institute of Technology Goa**

Farmagudi, Ponda, Goa-403401



## Course Instructor



**Prof. Prasad N. Enjeti, PhD, PE, F. IEEE**  
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Prof. Prasad Enjeti is a member of Texas A&M University faculty since 1988 and is widely acknowledged to be a distinguished teacher, scholar and researcher. He received his B.E. degree from Osmania University, Hyderabad, India, in 1980, the M.Tech degree from Indian Institute of Technology, Kanpur, in 1982, and Ph.D. degree from Concordia University, Montreal, Canada, in 1988, all in Electrical Engineering. His research emphasis on industry-based issues, solved within an academic context, has attracted significant external funding. Up until now, he has graduated 29 PhD students and 11 of them hold academic positions in leading Universities in the world. He along with his students have received numerous best paper awards from the IEEE Industry Applications and Power Electronics Society. His primary research interests are: Advance converters for power supplies, motor drives; power quality issues, active power filter development; utility interface issues, advancing switching power supply designs and solutions to complex power management issues; power conditioning systems for fuel cells, wind and solar energy systems; and design of high temperature power conversion systems with wide band-gap semiconductor devices. He holds four US patent and has licensed two new technologies to the industry so far. He was the recipient of eight best papers awards in IEEE Conference and transaction publications. In year 2000, he was elected to Fellow grade by the IEEE Fellow Committee for "Contributions to solutions of utility interface problems in power electronic systems and harmonic mitigation". He is the lead developer of the Power Electronics / Power Quality & Fuel Cell Power Conditioning Laboratories at Texas A&M University and is actively involved in many projects with industries while engaged in teaching, research and consulting in the area of power electronics, motor drives, power quality and clean power utility interface issues.

## Overview of the Course

Adjustable speed AC drives have become the preferred choice in many industrial applications where controlled speed is required. At the same time, the maturing of the technology and the availability of fast and efficient solid state power semiconductor switches (IGBTs) has resulted in voltage source, PWM controlled inverters becoming a standard configuration in the power range to 500kW. While high frequency PWM control represents the most advanced drive concept, when inappropriately applied, it also generates side effects, some which have been recognized only recently. This course has been designed to cover application issues of PWM inverter controlled ac motor drives which include: damage to motor insulation due to reflected voltages caused by long motor leads; the mechanism of motor bearing failures due to excessive common mode dv/dt and leakage currents to ground.

Following a description of the problems, several practical solutions are also presented and analysed. Finally, line harmonic problems caused by the input diode rectifier are also described and several low cost solutions selected to meet IEEE 519-1992 are presented. PWM inverter/motor manufacturers, system designers as well as adjustable speed drive application engineers and users will find this course informative and beneficial.

## Course Objectives

The primary objectives of the course are as follows :

- Exposing participants to various Power electronic converters fed drives and power quality issues in inverter fed drives. To focus on the various application of PWM inverter fed drives.
- Impart hands-on training to students and practicing engineers.
- Building confidence and capability amongst the participants in the applications of PWM inverter fed drives.
- Highlighting various key issues in the area of electric drives.
- Providing exposure to practical problems and their solutions, through case studies and live projects in electrical drives.
- This course will be taught in 5 days, with computer based exercises and simulations.

## Course Outline

- **Introduction to ASDs:** Reasons for using ASDs; Application environment (speed/torque control & energy saving); Micro drives and Motor mounted converters – selection.
- **Application Problems Related to high dv/dt:** Voltage reflection analysis and calculation of motor terminal peak voltage; Common-mode voltages; Various filter configurations; Guidelines for motor selection; Different types of magnet wire, including some new developments; Methods for reducing conducted and radiated EMI, illustrated by experimental results; Basic problems caused by shaft voltages and bearing currents
- **Power Quality Compliance of ASD Equipment:** IEEE 519 Standard; Performance of an ASD during supply voltage unbalance; Methods for reducing harmonic distortion.; Low cost clean power utility interface systems for ASDs; Nuisance tripping of ASD systems caused by voltage sags; utility capacitor switching transients and some solutions; ASD ride-through issues ; Summary and Discussion

## Expected Outcome

- To know the importance of ASD and its applications.
- To know about the problems in implementing ASD and solution techniques for the same.
- To acquire knowledge on effect of ASD equipment on power quality and ASD ride-through issues.

## Who Can Attend ?

- You are an engineer and researcher from manufacturing, service and government organizations including R&D laboratories interested in designing converters for alternate energy sources.
- You are a student or faculty/staff member from an academic institution interested in learning how to do research on Advance Electric Drives.

## About the Institute

The National Institute of Technology Goa (NIT Goa) is a premier technical Institute of the region. NIT Goa was established in the year 2010 by an act of parliament (NIT act 2007) and it is declared as 'Institute of National Importance'. The Institute offers under Graduate and Post Graduate courses in Computer Science and Engineering, Electronics and Communication Engineering and Electrical and Electronics Engineering. The Institute also offers Ph. D in all the three above mentioned engineering departments. Along with that the Institute offers Ph. D in Mechanical Engineering, Physics, Chemistry, Mathematics, Economics and English. The Institute is sincerely attempting to deliver quality education and to achieve excellence in teaching, learning and research with high professional ethics.

## About the Department of EEE

The Department of EEE has been actively engaged in teaching and research in diverse fields of Electrical Engineering with well qualified, and experienced faculty. The department offers a UG (B.Tech) Program in Electrical & Electronics Engineering, one PG (M.Tech) Program in the specializations of Power Electronics & Power Systems. The Department also offers Ph.D Programs in all areas of Electrical Engineering. All along, the department has been at the modernization of the curriculum for both UG and PG courses.

## Co-ordinators - GIAN course ASMDS 2K17



### Dr. Suresh Mikkili

Dr. Suresh Mikkili (Dean Students' welfare) is working as an Assistant Professor in the dept. of Electrical and Electronics Engineering, National Institute of Technology, Goa. He received his Ph.D. (2010-2013) and Masters (M.Tech) (2006-2008) in Electrical Engineering from National Institute of Technology, Rourkela, India. His main area of research includes Power quality improvement issues, Active filters, Power Electronics Applications to Power systems and Applications of Soft Computing Techniques. He has delivered several talks in his research area. He has published more than 40 research papers in reputed International Journals and conferences. He has authored a book entitled "Power Quality Issues : Current Harmonics" published in CRC Press, Taylor & Francis Group.



### Dr. Barry Venugopal Reddy

Dr. Barry Venugopal Reddy is working as an Assistant Professor in the Department of Electrical and Electronics Engineering, National Institute of Technology Goa, India. He has received Ph.D. and M.Tech in Electrical Engineering from National Institute of Technology Warangal. His research interests are Multi-level inverters, Multi-level PWM Switching Strategies, Multi-level inversion realized through Open-end winding Induction motor drives, Renewable energy systems. He has published more than 15 research papers in reputed International Journals and conferences.