

Permanent Magnet Synchronous and Brushless DC Motor Drive Systems

Overview

Permanent magnet synchronous and brushless dc motors and their drive systems have made rapid advancements in theory, modeling, control and applications over the past three to four decades. Their growth in western and developing countries have been driven by high efficiency and energy savings requirements in the recent times from home appliances to electric and hybrid car drives and by precision operational requirements earlier such as in servo motor drives for machine tool applications. Its use in variable speed applications is wide and pervasive across the nations. Recently there is an awakening interest and activity in these motors and drives, which is justifiable in the context that India has one of the largest markets from high volume applications such as home appliances to electric scooters and electric cars and can benefit from such technologies in the energy and high performance goals. The R&D and applications considerably lag behind western countries and China in these motor drive systems. This course is designed to assist the engineers in industry, academic faculty, researchers and post-graduate students to become familiar with the theory, operation, modeling, analysis, and design of the PMSM and PMBDC motor drive systems and to the recent advances.

The Primary objectives of the course are as follows:

- i) Familiarize the basics of PMSM and BLDC machines, their various forms and their distinct advantages over other machines to the participants and to introduce the basic design of these machines
- ii) Introduce the basics and advanced knowledge of power electronics and converters required to operate these motors
- iii) The theory, operation, modelling, simulation, analysis and design of these motor drives are systematically developed
- iv) Expose the participants to MATLAB simulation of these drive systems with concrete examples

Course	<p>Permanent Magnet Synchronous and Brushless DC Motor Drive Systems- Dec. 18 – Dec. 29, 2017.</p> <p>Number of participants for the course will be limited to <u>forty</u>.</p>								
Who should attend	<ul style="list-style-type: none"> ▪ Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories ▪ Faculty members from reputed academic and technical institutions ▪ Students at different levels (B.Tech/M.Tech/Ph.D.) 								
Fees	<p>The participation fee for the course is as follows:</p> <table style="width: 100%; border: none;"> <tr> <td>Foreign participants:</td> <td style="text-align: right;">US\$ 500</td> </tr> <tr> <td>Persons from industry:</td> <td style="text-align: right;">Rs. 10,000/-</td> </tr> <tr> <td>Faculties from academic institutions/ Govt. research organizations:</td> <td style="text-align: right;">Rs. 7,000/-</td> </tr> <tr> <td>M.Tech/ Ph.D. students:</td> <td style="text-align: right;">Rs. 3,000/-</td> </tr> </table> <p>The above fee includes all instructional materials, laboratory equipment usage charges, and internet facility. The participants will be provided accommodation on payment basis.</p>	Foreign participants:	US\$ 500	Persons from industry:	Rs. 10,000/-	Faculties from academic institutions/ Govt. research organizations:	Rs. 7,000/-	M.Tech/ Ph.D. students:	Rs. 3,000/-
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R. Krishnan is Professor Emeritus of electrical and computer engineering at Virginia Polytechnic Institute and State University. His research interests are in electric motor drives. He has published more than 170 technical papers and he has 30 patents and 6+ pending. He founded two electric drives companies namely *Panaphase Technologies* and *Ramu Inc.*, which were later acquired by Delta-Gee and Regal Beloit Corporation

respectively. He has authored the following three well-received books in the field of electric machines, drives and control:

- (i) *Electric Motor Drives (Prentice Hall)*,
- (ii) *Switched Reluctance Motor Drives (CRC Press)*,
- (iii) *Permanent Magnet Synchronous and BLDC Motor Drives (CRC Press)*,

He has co-edited and co-authored *Control in Power Electronics (Academic Press)*.

Prof. Krishnan is a recipient of best paper awards from IEEE Industry Applications Society's Industrial Drives committee (Five awards) and Electric Machines committee (one award). In addition, he received the first prize from IEEE Transactions on Industry Applications for his paper and the 2007 Best Paper Award from IEEE Industrial Electronics Magazine. He was awarded IEEE Industrial Electronics Society's Dr. Eugene-Mittelmann Achievement Award for Outstanding Technical Contributions to the field of Industrial Electronics in 2003. Krishnan is a *Life Fellow, IEEE* and a Distinguished Lecturer of IEEE Industrial Electronics Society. He is an elected Life AdCom Member of IEEE IE Society and served as its Vice-President (Publications) from 2002 to 2005.



Dr. R. K. Jarial is an Associate Professor in the Department of Electrical Engineering at National Institute of Technology Hamirpur. Presently, he is also the co-ordinator of TIFAC Centre of Relevance & Excellence (CORE) on Power Transformer Diagnostics at NIT Hamirpur. His current research interests include power electronics and drives, condition monitoring of electrical apparatus and high voltage engineering. He has authored/co-authored more than 100 technical papers in international journals and conferences.



Dr. Chandrasekaran is an Assistant Professor in the Department of Electrical Engineering at National Institute of Technology Hamirpur. He obtained his Ph.D. degree from Indian Institute of Technology Gandhinagar. His research interests include grid synchronization techniques and power system signal processing.



Course Coordinators

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Global Initiative of Academics Networks (GIAN)
**Permanent Magnet Synchronous and Brushless DC
 Motor Drive Systems**
 December 18-29, 2017
 National Institute of Technology Hamirpur



REGISTRATION FORM

1. **Name** :
2. **Gender** Male Female
3. **Qualification** :
4. **Designation** :
5. **Institution/ Industry** :
6. **Address** :
7. **Mobile No.** :
8. **E-mail** :
9. **Accommodation required?*** Yes NO
10. **GIAN Application ID (if any)** :

* Kindly note that accommodation on payment will be provided on first come first serve basis.

- Course Fee : Faculty from Academic Institutions/Govt. Organizations - Rs. 7,000/-
 Participants from Industry/ Research Organizations - Rs. 10,000/-
 Participants from abroad - US \$500
 M.Tech/ Ph.D. Students- Rs. 3,000/-

Payment should be made through:

Demand Draft in favour of “**Registrar, NIT Hamirpur**” payable at Hamirpur.

DD no:, Date:
 Amount:, Bank:

Signature of participant

Signature of sponsoring authority

NOTE:

Participants are requested to send the duly filled in registration form along with DD to

Dr. Chandrasekaran,
 Assistant Professor, Department of Electrical Engineering,
 National Institute of Technology Hamirpur, Himachal Pradesh, 177005.

E-mail: chandru.ceg94@gmail.com.

Last date for registration: 15-11-2017