

**Two Weeks TEQIP III Sponsored Short Term Training Program (STTP)  
On “Hands On: Mathematical Modelling and Software Simulation for Power systems and  
Electrical Machines (HOMSPM)”, From 10 – 20 June 2019**

**At Department of Electrical Engineering, SVNIT Surat, Gujarat-395007**

Course Coordinators: Dr. Anandita Chowdhury, Dr. Ashish Panchal, Dr. Hitesh Jariwala,  
Dr. Pranav Darji, Dr. Prasanta Kundu, Dr. Vasundhara Mahajan.

**1. The Motivation:**

The modelling and simulation are the techniques to relate and analyse. The system understanding and concepts get shape via models and exhibition of results. The implementation and execution of any system are the artistic ways of linking imagination and innovation with the realism. Due to the technological advancements and modernization, the advanced control and programming techniques are being developed. In this context, artificial Intelligence based techniques have become popular for solving different problems in power systems such as control, planning, scheduling, forecast etc. These techniques can deal with difficult tasks faced by applications in modern large power systems with added interconnections installed to meet increasing load demand. Artificial neural network (ANN) and fuzzy logic controllers (FLC) are very versatile and popular. Power systems are living in an era of major changes, pushed forward by the emergence of new technical issues and the availability of innovative technologies, enabling new functions for monitoring and control of transmission network operation and stability. This includes the addition of renewable energy sources and changes in energy market.

The finite element method (FEM) is a powerful simulation technique used to solve boundary-value problems in a variety of engineering circumstances. Finite elements, amongst numerical methods, have emerged as suitable techniques for electrical design, performance evaluation, and device optimization in low frequency applications. Over the last two decades, several variants of the finite element method have been developed and these have successfully been applied to rotating electric machines, transformers, permanent magnet motors, and power generation and transmission equipment.

This course serves to bring communities together to share knowledge, learn from one another and propose new collaborations in order to further advance the field. This course is aimed at the full spectrum of people involved in electrical engineering/science from model development, validation and all the way through to application. The experts will identify the prioritize areas in the field that require further research. This consist of hands-on intensive modules involving a combination of lecture and laboratory practicums, providing students and research professionals with the background they need to frame engineering questions in mathematical parlance, embark on analyses of these models, and work with a diverse array of data using advanced computational methods. The basic modelling and simulation techniques for electrical machines/power system will be elaborated to the participants. This course will demonstrate the methodology of incorporating the technological advances and the implementation of sophisticated computing techniques. Upon completion, attendees should be able to perform research analysis, create reproducible workflows, extend understanding through independent study using web-based resources, express hypotheses as mathematical models and utilize for societal benefits.

**2. The course methodology includes:**

- ❖ *Exploration of various developments in electrical machines/power electronics/power system engineering with mathematical modelling and implementation of simple case studies/demos.*
- ❖ *Simulation of basic/advanced components of electrical systems.*
- ❖ *Basics of various simulation software and tools/tool-boxes/block-sets.*

**3. The major intentions:**

Following are the broad objective of the course; however it is not limited to\*\*\*.

- *Integration of renewable energy sources into power systems.(solar, Wind etc.)*
- *The application of advanced converters/power electronics converters to power system. (FACTS/Power filters)*
- *Advance computational tools for electrical machines and power systems. Modern condition monitoring tools for electrical machines.*
- *FEM based design of electrical machines.*
- *Power system reliability, security, deregulation and restructuring.*

- Optimization in power system engineering and its simulation in MATLAB using optimization tool box.
- Artificial intelligence in power system engineering and its simulation and programming by using MATLAB tool box. (NN tool, Fuzzy, Genetic algorithm etc.)

**\*\*\* The course will cover basics of simulation in MATLAB/Simulink by using relevant tool boxes in general. Additionally, other simulating tools such as PowerSimulator, PSAT, PSAD etc. will also be described.**

#### **4. Speakers:**

The eminent speakers from IITs/NITs/ and other reputed Institutes will be invited for vast revelation and knowledge enrichment.

#### **5. Who can apply?**

The faculty members/students of electrical engineering of various technical Institutes/Colleges and industrial persons only can apply for the course.

#### **6. Registration and General Information:**

Completed application of the participation for the course should reach in the attached format via post/courier/in person at the given address. **The last date of reaching applications is 20<sup>th</sup> May 2019.** The candidates will be informed of their selection through e-mail by **25<sup>st</sup> May 2019.** Limited seats are available in this course hence shortlisting will be done on the basis of first come and first serve only. However, the candidates will be informed as soon as their completed application form reaches to the coordinator (via email or post). The breakfast and working lunch will be provided to the participants. The participants would not be paid any TA and/or DA.

(\*Note: The candidates can send the scan copy of **completed application form** and demand draft via email at [vmahajan@eed.svnit.ac.in](mailto:vmahajan@eed.svnit.ac.in), [vasu.daygood@gmail.com](mailto:vasu.daygood@gmail.com). However, the hard copy must be submitted at the time of registration.)

#### **7. Accommodation**

Suitably furnished accommodation will be arranged, if requested in advance, in the hostels/guest houses of the SVNIT on payment basis by participants for out stationed candidates on twin sharing basis. The family accommodation will not be provided in any case. The accommodation and tariff details are available on SVNIT website. (<http://www.svnit.ac.in>)

#### **8. Course fee**

(a) Students UG/PG/Ph.D.: Rs. 3000 (b) Academicians/College Teachers: Rs. 5000/-

(c) Delegates from industries: Rs. 8,000/-

The course fee to be paid through demand draft drawn on SBI in favour of “**Director, SVNIT- TEQIP IRG**”, payable at “**Surat**” and should be sent along with the completely filled application forms. Please do not send banker’s cheque.

(Note: The fees will be returned/refunded, if the candidate is not selected.)

#### **9. Address for Communications:**

Coordinator, HOMSPM

Dr. Vasundhara Mahajan, Department of Electrical Engineering

Sardar Vallabhbhai National Institute of Technology, (SVNIT)

Ichchhanath, Near Piplod, SURAT, Gujarat – 395007.

Tel. : 0261-2201670, 2201562.

E-mail : [vmahajan@eed.svnit.ac.in](mailto:vmahajan@eed.svnit.ac.in), [vasu.daygood@gmail.com](mailto:vasu.daygood@gmail.com).

**Application Form**

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**Name of the applicant:**.....

**Gender: (M/F)**..... **DOB:**..... **Age:**.....

**Qualification and specialization:**.....

**Experience:**.....

**Designation:**.....

**Address for correspondence:** .....

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**Sponsoring Institute/Industry address:** .....

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**Contact No.:**..... **Email:**.....

**Accommodation required? Yes/No, (mention duration if Yes):** .....

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**PAYMENT DETAIL: DD No.:** ..... **Date:** .....

**Amount (Rs.):** .....

**Drawn on (Bank Name with branch):**.....

***Signature of the Applicant***

The applicant will be permitted to participate in the above program if selected. Further, I have personally talked with the applicant and the applicant seemed to be sure to attend the course, if selected.

***Signature of Head of the Institution/Department with Seal***

***Date:***.....

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