ABOUT COURSE

Why the course on MEMS?

Miniaturization and capability to have higher performance with lower cost are basic characteristics of MEMS technology that make it especially attractive and beneficial in diverse applications. For these reasons MEMS components are inevitable in the future devices. This program would enable participants to understand and learn various MEMS design, fabrication and characterization techniques. Unique part of this course is blend of characterization and fabrication methodologies pertaining to MEMS.

COURSE OBJECTIVES

The objective of this course is to provide understanding of design, fabrication and characterization of Micro-electromechanical systems. The course emphasizes on learning of design principles and various fabrication techniques for development of microstructures for MEMS. In depth understanding of various recently developed 3D micro-fabrication techniques for MEMS is also the central objective of the course. Further course is also developed to provide understanding of the geometrical and dynamic characterization techniques for microstructures.

SCOPE OF COURSE

Scope of the course ranges from introduction to MEMS to its end use applications. Potential materials for MEMS and its processing will be discussed in the course. Case studies with an aim to demonstrate various principles in design and development of the MEMS will also be discussed. The course also cover the characterization techniques and end use applications of the developed MEMS.

SIGNIFICANCE OF COURSE

This course will provide more insight to the participants for using/developing/researching MEMS devices in their respective organizations for several innovative practical solutions.

REGISTRATION PROCESS

- One can register for the course as per the specified process of AICTE Training and Learning (ATAL) Academy.
- Visit **https://www.aicte-india.org/atal** for registration
- For certificate, attendance and passing of Examination is mandatory.

RESOURCE PERSONS

The program will be conducted by eminent speakers from industry and academia.

COURSE SCHEDULE

Duration : 23rd – 27th November 2020
Timing : 10 am to 5pm

WHO SHOULD ATTEND THE COURSE

This course is useful for engineers of different disciplines aspiring towards development of MEMS for various applications ranging from automobile, biomedical etc. The course will be most beneficial for:

- Engineering post-graduates (M.E./M. Tech. in Mechanical, Production, Automobile, Aerospace, Bio-medical, Electrical, Electronics, Chemical Engineering)
- Professionals in Design, Manufacturing industry Faculty members from academic and research institutions
- PhD scholars

CONTACT FOR MORE INFORMATION

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All India Council for Technical Education (AICTE) Training and Learning (ATAL) Academy

Sponsored one week online Faculty Development Program On

"MICRO-ELECTROMECHANICAL SYSTEMS (MEMS)

23rd - 27th November 2020

Coordinator

Dr. Kiran S. Bhole
Associate Professor
Mechanical Engineering Department

Organized By

Mechanical Engineering Department
Bharatiya Vidya Bhavan's
Sardar Patel College of Engineering
(An autonomous institution affiliated to University of Mumbai)

Telephone: 91-22-262 32 192 / 262 89 777
Fax: 91-22-262 37 819 |
URL : www.spce.ac.in

ABOUT THE INSTITUTE

Sardar Patel College of Engineering (SPCE) under the management of the Bhartaiya Vidya Bhavan, was founded by Kulapati Dr. K. M. Munshi. It was established to meet the growing demand for engineering talent.

The foundation stone of the college was laid on 17th September 1961 by Shri. Y. B. Chavan (the then Chief Minister of Maharashtra who later became the Defence Minister of India.)

The college was inaugurated by the first Prime Minister of Independent India, Pandit Jawaharlal Nehru in 1962.The college is dedicated to Sardar Vallabhbhai Patel, an eminent nation builder of independent India.

The college is autonomous and affiliated to the University of Mumbai for the full-time degree, post graduate, and research programs. The institute has set high standards for aspiring engineering students and also meets the need of quality education in the challenging world of business.

Over the last 50 years the college has gained an excellent reputation in the field of Technical Education.

SPCE is one of the few colleges that have received Grade 'A+' rating for its aided courses from the Govt. of Maharashtra which certifies the spirit of excellence that the institute has symbolized and always practiced. Institute celebrated its golden jubilee in the year 2012.

MECHANICAL ENGINEERING DEPARTMENT

Mechanical Engineering Department of Sardar Patel College of Engineering commenced in 1962. The department offers one undergraduate program (B. Tech in Mechanical Engineering), two postgraduate programs (M. Tech. in Thermal Engineering and M. Tech. in Machine Design) and a Ph.D. program.

The B. Tech. (Mechanical Engineering) program was awarded accreditation (tier-I) by NBA for period of AY2017-18 up to 2020-21. The M. Tech. (Machine Design) and M. Tech. (Thermal Engineering) programs were awarded accreditation for period of AY2017-18 up to 2018-19. The application for automatic extension of M. Tech. programs' accreditation till AY2020-21 is in process.

The department has modern infrastructure with well-equipped laboratories and computational facilities with up-to-date hardware and software resources. The well qualified and experienced faculty of the department imparts knowledge to the students in the fundamental and applied aspects of Mechanical Engineering courses by adopting conventional as well as the latest teaching and assessment tools.

OBJECTIVES OF AICTE ATAL ACADEMY

- To set up an Academy which will plan and help in imparting quality technical education in the country
- To support technical institutions in fostering research & innovation and entrepreneurship through training
- To stress upon empowering technical teachers & technicians using Information & Communication Technology
- To utilize SWAYAM platform and other resource for the delivery of trainings
- To provide a variety of opportunities for training and exchange of experiences such as workshops, Orientations, learning communities, peer mentoring and other faculty development programs.
- To support policy makers for incorporating training as per requirements

PATRON

Dr. Sesha Iyer
Director, BoG, Sardar Patel College of Engineering

Dr. Abhay Wagh
Director, Directorate of Technical Education, Maharashtra

Dr. M. M. Murudi
Principal In-charge, Sardar Patel College of Engineering

ORGANIZING COMMITTEE

Dr. M. M. Murudi	Principal In-Charge
Dr. Santosh Rane	Dean Academics
Dr. Sudhakar Umale	Head of Mechanical Engineering Department
Dr. Kiran S. Bhole	Course Coordinator
Prof. Sharad Valvi	Course Co-Coordinator
Prof. Haseen Shaikh	Course Co-Coordinator

CONTENTS

- Introduction to MEMS
- Evolution of MEMS
- MEMS Materials and their preparation
- Designing MEMS
- Fabrication Processes for MEMS
- Silicon Micromachining : Surface
- Silicon Micromachining : Bulk
- Reverse Micro-EDM
- Laser based micromachining
- About MEMS Laboratory at ITB
- About Nanofabrication facility at IITB
- 3D Micro fabrication (Additive Manufacturing)
- Characterization tools for MEMS and micro structures