



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

NATIONAL MEMS DESIGN CENTRE (NMDC)

Department of Electronics and Communication Engineering

Report

on

Two Weeks **Hands-On Training Program** on

“Fundamentals Aspects of MEMS for Sensor Applications”

From 19-04-2021 to 01-05-2021.

Resource Person : Dr. T. Satyanarayana, Professor, Dept. of ECE.

Coordinator : Dr.B.Poornaiah, Professor, Dept. of ECE

Target Students : II B. Tech. ECE , EIE

No. of Participants : 31

Objective:

To introduce fundamental aspects of Micro-Electro-Mechanical Systems (MEMS) technology and provide hands-on training to simulate small scale devices involving various physical interfaces such as electromagnetic, semiconductors, structural mechanics, acoustics, fluid flow, heat transfer, and chemical phenomena using COMSOL Multiphysics Software v 4.3b.

Benefits of the Event:

1. Hands-on expertise in implementing technical projects by means of Design, Modeling ,Analysis and Optimization with the help of COMSOL, Multiphysics software tool.
2. Awarding **Mandatory Certificate** under 2 weeks (Duration of 100 Full Hours) Training/In-House Training (non-credit) program which is mandatory at the end of IV Semester as per R17 Regulations.

- Further, it facilitates job opportunities in emerging microelectronics industries and also Post Graduate admissions at Indian & abroad universities with possible financial assistance.

About the Program

Micro-Electro-Mechanical System (MEMS) technology has become one of the prominent emerging interdisciplinary research fields that integrate knowledge, concepts, and techniques covering many different spatial and temporal scales. Coming days, smart sensors and Microsystems will be key elements for upcoming smart cities in India. The training program aims at providing guidelines for designing, simulating, modelling, and analysing of micro scale devices using COMSOL Multiphysics Software tool. Various example models are designed and modelled for better understanding. Resource person will emphasize how microelectronics and advanced MEMS based sensors can support the development of innovative high value-added products that provides greater benefits for many industries.

Details for Registration

- **Registration Fee** per participant: Rs. 200/-.
- **Registration Link:** <https://forms.gle/Y23dTzvJVUJbqoXL7>
- The Maximum number of participants per batch is limited to **30 only**.
- Selection follows “**First come first serve basis**”.

Schedule of Activities

| S.No | Date | Activity |
|-------------|-------------|---|
| 1. | 19-04-2021 | Introduction to MEMS Technology |
| 2. | 20-04-2021 | Fundamentals of MEMS Devices |
| | 22-04-2021 | |
| 3. | 23-04-2021 | Importance of Scaling laws |
| 4. | 24-04-2021 | Design and Modeling Aspects of Microscale devices |
| 5. | 26-04-2021 | Introduction to COMSOL Multiphysics Software |
| | 27-04-2021 | |
| 6. | 28-04-2021 | Hands on Training – Example models |
| | | 1) Fluid flow between two parallel plates |
| | | 2) Microresistor beam |
| | | 3) Piezoelectric ultrasonic transducer |
| 7. | 29-04-2021 | |
| 8. | 30-04-2021 | |
| 9. | 01-05-2021 | 4) Capacitive MEMS pressure sensor |

Feedback link: <https://forms.gle/DhGZg7DXJYDB1qvn6>

Feedback/Suggestions:

1. Requires more practical sessions to understand all the modules well.
2. Implementation of one real time project after program would really help a lot.
3. Overall sessions were very useful and informative.

Comments on feedback:

Due to unexpected second phase lock down of Covid-19, it was difficult to spare time on implementing real time projects including more practical sessions. We consider it in future programs.

Photograph



Dr. Y. Amar Babu, HOD, ECE addressing the participants during Inaugural Function of Workshop along with, Dr. T. Satyanarayana, Resource Person of the program, Dr.B.Poornaiah , Coordinator of the Program on 19-04-2021.



Dr. Y. Amar Babu, HOD, ECE addressing the participants during Valedictory Function of Workshop along with, Dr. T. Satyanarayana, Resource Person of the program, Dr.B.Poornaiah , Coordinator of the Program.



Certificates Distribution to the students by Dr. Y. Amar Babu, HOD, ECE and Dr.T.Satyanarayana, Resource person.



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REGISTERED STUDENTS

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Department of Electronics and Communication Engineering (ECE)

National MEMS Design Centre

Circular

Date: 10-04-2021.

It is hereby informed to all II B.Tech. Students that National MEMS Design Centre (NMDC), Department of ECE is organizing Two Weeks Hands-On Training Program on “**Fundamental Aspects of MEMS for Sensor Applications**” during 19-04-2021 to 02-05-2021. The proposed program would enable the II B.Tech students of ECE, EEE, ME & EIE to get the following benefits.

Awarding **Mandatory Certificate** under 2 weeks (Duration of 100 Full Hours) Industrial Training/In-House Training (non-credit) category at the end of IV Semester-R17 Regulations.

1. **Hands-on expertise** in implementing technical projects by means of Design, Modeling, Analysis and Optimization with the help of COMSOL Multiphysics software tool.
2. Further, it facilitates **job opportunities** in emerging microelectronics industries and also Post Graduate admissions at Indian & abroad universities with possible **financial assistance**.

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For more details, contact:

- i. **Dr. B. Poornaiah**, Professor, Dept. of ECE
- ii. **Mrs. M. Ramya Harika**, Asst. Professor, Dept. of ECE
- iii. **Mr.B.P. Madhusudan**, Asst. Professor, Dept. of ECE



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“Fundamentals Aspects of MEMS for Sensor Applications”

From 19-04-2021 to 01-05-2021.

Statement of Expenditure

| | |
|---|---------------------------------|
| Registration fee per student | : Rs. 200/- |
| Total no. of Participants | : 31 |
| Amount received from registrations | : Rs. 6,200/- |
| Certificates printing | : Rs. 700/- |
| Honorarium to Resource Persons | : Nil (In-House Faculty) |
| Balance Amount | : 5,500/- |

Signature of Coordinator

Head of the Department