



**Mahatma Gandhi Mission's College of Engineering & Technology**  
**Kamothe, Navi-Mumbai-410209**

**Department Of Mechanical Engineering**

Student Centric  
**4 Days Workshop Program**

**On**

**“Revisiting Basics Mechanical Engineering and Life Skills”- ROME 2K-17**

**(19<sup>th</sup> Dec 2017 – 22<sup>nd</sup> Dec 2017)**

**Certificate Program**  
**On**  
**Revisiting Basics Mechanical Engineering and Life Skills**

**Patrons**

Shri. K. N. Kadam, Hon. Chairman, MGM

Dr. S. N. Kadam, Hon. Trustee, MGM

**Chief Coordinators**

Dr. K. G. Narayankhedkar

Dr. S. K. Narayankhedkar

**Convener**

Prof. Sanjay Bhandari

**Coordinator**

Prof. Priyanka Verma

Prof. Nilesh Bodkhe

## PREFACE

4 days workshop on **Revisiting Basics Mechanical Engineering and Life Skills (ROME 2K17)** is to motivate the students to know about the basics of Mechanical Engineering and to guide them for learning other basic life skills.

Basically, there are three approaches to solve any engineering problem and to solve any engineering problem basics of mechanical engineering is required. The whole process of exam oriented evaluation and grading does not give us the opportunity to do so which is so essential.

The whole idea was to educate our students about the basic Mechanical Engineering, its applications, solving methods and to guide them about the subdivisions of Mechanical Engineering.

In these days, Interdisciplinary divisions are also playing a very important role. People from different disciplines come together for solving any engineering problem. Hence student was encouraged to have a basic knowledge of all the disciplines for better research & development.

### **ACKNOWLEDGEMENT**

The organizers of the workshop would like to acknowledge many individuals and organization without whom this workshop would not have been possible.

First of all, I would like to extend my sincere thanks to our Hon. Chairman Shri. K. N. Kadam and Hon. Trustee Dr. S. N. Kadam for their kind support & guidance.

I am highly indebted to Hon. Director General Dr. K. G. Narayankhedhkar and Hon. Principal Dr. S. K. Narayankhedhkar for their constant supervision & encouragement.

I would like to express my gratitude towards Head of Departments for their kind co-operation and encouragement which help us to complete this workshop.

I would like to express my special gratitude and thanks to Industry/Institute persons for giving us such attention and time.

My thanks and appreciations also go to my colleagues who were part of this workshop and people who have willingly helped me out with their abilities.

**Coordinator**

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## **EXECUTIVE SUMMARY**

On December 19<sup>th</sup> 2017, MGM CET (mechanical) has organized a four day workshop entitled “Revisiting Basics Mechanical Engineering & Life Skills (ROME 2K17)” at MGM CET, Kamothe.

The main objective of this workshop was to train the current average engineering student for “Mission practicing mechanical Engineering”. We thought it is necessary to give students a doctrine towards their development in this direction. The whole process of exam oriented evaluation and grading does not give us the opportunity to do so which so essential.

The long term expected result of the workshop is to enhance the basics of Mechanical Engineering among students and to guide them for “LEARNING OTHER BASIC SKILLS “.

During the workshop, 36 students from final year and third year were trained on good practices in Mechanical Engineering. The four day workshop was divided broadly into 2 sessions on each day. **This training program has three dimensions:**

- 1. Basic life skills required**
- 2. Three approaches to solve any Engineering problem**
  - **Analytical Approach**
  - **Experimental Approach**
  - **Computational approach**
- 3. Subdivisions implied in Mechanical Engg**
  - **Thermal and fluids**
  - **Design**
  - **Manufacturing and interdisciplinary**

In order to make this venture more effective and keep students fresh A NOVEL TECHNIC OF BASIC SCIENCE BASED TOYS AND PUZZLES was adopted.

**The following topics were covered:**

- Finite element method, Constitutive modeling and applications
- Life Skills for Engineers
  - Becoming an Ideal Manager
  - Becoming an Ideal Human Being
  - Techniques to relax and meditate
- Experimental approach in Mechanical Engg. and related case studies.
- Nanotechnology
- Mechanical Engineering: Brief Appreciation, Random Reflections on fun, Creativity & Responsibility
- Industrial Applications Of Heat Exchangers

**The following Eminent Experts from Institute and Industry Trained the participants:**

- **Dr. Chandrakant Desai**, Regents Professor, The University of Arizona, Tucson, AZ, USA
- **Mr. Rajesh Kothari**, Venture Capitalist, Angel Investor Tata Unisys Ltd (now merged into TCS) as a Software professional
- **Prof. Sandeep Joshi**, Vice-Principal Pillai College, New Panvel
- **Dr. D. K. Shinde**, Associate Professor, Production Engineering Department, VJTI
- **Prof. A. W. Date**, IIT Mumbai
- **Mr. N. B. Kulkarni and Guruprasad Bandekar**, Head Engineering Department, TOYO Engg. India Ltd. Mumbai

On the last day of the workshop, a feedback was taken from the participants to assess their interest and learning capability in the subject. The feedback result is given in Annex A-6. The feedback has been analyzed and the salient features are presented in Annex A-5. The feedback was encouraging. The participants also made some recommendations, which are summarized, in Annex A-6.

Overall, the workshop was successfully conducted .

## **BACKGROUND**

MGM's College of Engineering and Technology (MGM CET) is governed by Mahatma Gandhi Mission, A Charitable Trust, Registered under the Bombay Public Trust Act 1950 and Societies Regulation Act 1860. Since its inception in 1982, Mahatma Gandhi Mission has developed into an excellent educational group and is totally committed to human resource development. In continuation of its proud tradition of enriching the human resource needs of the country, the Mission has set up in 1986, our institute MGM's College of Engineering and Technology, Kamothe, Navi Mumbai. The objective of the institution is to impart value based quality engineering education by combining academics with exposure to industry. With this view in mind it provides state –of-the art infrastructure facilities and academic resources to its students. College is affiliated to University of Mumbai and approved by AICTE, New Delhi. MGM CET is awarded with ISO- 9001-2000 Certification by RINA for providing technical education in engineering field as per the guidelines of University of Mumbai. The institute is one of the few engineering colleges to achieve this international standard for implementing and maintaining Quality Management System.

The objectives of Department of Mechanical Engineering are

- To become one of the outstanding centre of excellence in training aspiring engineers in the Mechanical Engineering and related developing disciplines.
- To provide simulating excellent environment for budding Mechanical Engineers by adopting innovative methods.
- To prepare students to face future challenges in the field of Mechanical Engineering with ethics and mission to serve related industry.
- To establish centre of research and development in various domains of Mechanical Engineering.

Keeping these objectives in the mind, the workshop on Mechanical Engineering Basics & Life skills was organized.



## **OBJECTIVES**

The main objective of this workshop is to train the current average Engineering student for practicing mechanical Engineering. The workshop further aimed the following:

- To give students a doctrine towards their development in this direction.
- To upgrade the skills of students who will impart their knowledge to upcoming engineers and technicians.
- To increase awareness of the students about Basics & fundamental of Mechanical Engineering
- To impart the knowledge and value of meditation & relaxation in our general life
- To upgrade their management skills
- To convey basic life skills and importance of society of contribution as an Engineer.

## **ABOUT THE WORKSHOP**

The 4 day workshop entitled “Revisiting Basics Mechanical Engineering & Life Skills (ROME 2K17)” was divided broadly into 2 sessions each day from 19<sup>th</sup> December 2017 to 22<sup>nd</sup> December 2017. The first half of session on first day has started with the inaugural function. The workshop was inaugurated by Dr. Chandrakant Desai while the inaugural address was given by Prof. Salunkhe, HOD of Department of Civil Engg. HOD, Department of Mechanical Engineering along with 20 faculties & 48 students has participated in the first session. In continuation Dr. Desai has given his lecture on “Finite Element Method, Constitutive Modeling and applications”. On Second half of first day, there was a lecture on “Becoming an Ideal Manger” & “Becoming an ideal human” by Mr. Rajesh Kothari.

First half of session on second day was on topic “Experimental Approach in Mechanical Engineering” by Dr. Sandeep Joshi while second half of session on second day was on topic “Nanotechnology” by Dr. D. S. Shinde.

First half of session on third day was on topic “Mechanical Engineering: Brief Appreciation, Random Reflections on fun, Creativity & Responsibility” by Dr. A. W. Date while second half of session on third day was dedicated to Project Guidance.

First half of session on fourth day was on topic “Industrial Applications of Heat Exchangers” by Dr. N. B. Kulkarni while second half of session on fourth day was dedicated to feedback (written & oral) & certificate distribution.

## THE SESSIONS

The sessions were spread over four days from 10:30 am to 5:00 pm. The sessions used a variety of approaches—presentations, games, puzzles, discussions etc.

### *Day 1 Session 1*

The session began with a welcome of our chief guest Dr. Chandrakant Desai, followed by the lighting of the lamp to symbolize the inauguration of the workshop. Prof. Salunkhe, HOD of Department of Civil Engg has addressed our chief guest & audience. Following the inaugural session, session was started.

**About the Speaker:** Dr. Chandrakant Desai is a Regents Professor in The University of Arizona, Tucson, AZ, USA. He received a B.E. degree in 1959 in Civil Engineering from the Victoria Jubilee Technical Institute, University of Bombay. He worked in government and private agencies in the areas of design of structures and supervision of construction of buildings and dams. He received the Master of Science (M.S.) degree from Rice University, Houston, Texas in 1966. He then studied at the University of Texas, Austin and received the degree of doctor of philosophy (Ph. D) in 1968.

He worked in applied research in the areas of computer analysis, laboratory and field-testing, and constitutive models for geotechnical problems such as pile foundations, lock structures and ground water seepage in Waterways Experiment Station, U.S. Army Corps of Engineers, Vicksburg, Mississippi (1968-1974). In 1974, he joined the Virginia Polytechnic Institute and State University (VPI), where he was engaged teaching and research in the areas of geotechnical and structural engineering with emphasis on soil-structure interaction, computer (finite element) methods and constitutive modeling including design and fabrication of

various new test devices. He served as the Head of the Department from 1987-1991. In 1989, he was awarded the Regents Professorship by The University of Arizona.

**About the Session:** Dr. Chandrakant Desai has started the session on the topic “Finite element method” and has given the brief introduction about the topic. His topic was very informative and he has explained about modeling and its various applications.

### ***Day 1 Session 2***

**About the Speaker:** Mr. Rajesh Kothari is a Software professional, Venture Capitalist, Angel Investor Tata Unisys Ltd (now merged into TCS). He is a graduate engineer in Mechanical Engineering and a postgraduate in Industrial Management both from Indian Institute of Technology (IIT) Powai.

After developing couple of successful software products, he established a very successful business by taking up distribution of software products from established vendors like Microsoft, Adobe, Red hat, Symantec, Oracle and so on. Later he took distribution of Microsoft Press books. His current focus is on distribution of Digital Signature Certificates and high security SSL Certificates from Symantec for web site security.

Among other interests, he has been practicing Heartfulness Meditation since 1980 when he was studying at IIT Powai. He has been a certified trainer of Heartfulness meditation for several years.

### **About the Session:**

Mr. Rajesh Kothari has started the session on topic entitled “Life Skills for Engineers”. He has told us about the *Vitamins* of Decision making Roles.

P - Produce

A – Administration

E – Entrepreneur

I – Integration

*Decisions should be democratic & Implementation should be Dictatorial*, he said. After a wonderful session on management, there was a meditation session for 10 minutes and later relaxation session for 20 minutes with the suggestion that One should do meditation in the morning & Relaxation in the evening.

### ***Day 2 Session 1***

**About the Speaker:** Dr. Sandeep M. Joshi is a Vice-Principal in Pillai College of Engineering, New Panvel. He has completed his Ph.D. from Indian Institute of Technology Bombay in Mechanical Engineering in 2017. He has completed his M.Tech from Dr. B. A. Technological University, Lonere in Thermal and Fluids Engineering in 2008. His area of research is Development of Solar Dryer, Design Fabrication and Testing of Pancake type Heat Exchanger for WHR from Producer Gas, Enhancement of Shell and Tube Heat Exchanger Using Reduced Width Twisted Tape Insertion, WHR from Domestic Refrigerator etc.

He is a Member of Editorial Board in the International Journal of Latest Technology in Engineering, Management & Applied Science (IJLTEMAS) an Imprint of Research and Scientific Innovation Society for one year from September 2017. He is a Life member of Solar Energy Society of India, SESI since 2016, Life member of ISTE since 2008 and Associate member of ISHARE (Mumbai Chapter) since August 2008.

### **About the Session:**

Session started on topic entitled “Experimental approach in Mechanical Engg.” Experiment gives the factor which causes the effect but doesn’t gives reason WHY?? In this session, students got the idea about hypothesis, literature review, Inter-conclusion, Producer gas, Lime slurry, payback period etc. Students have got the chance to know the different approaches to solve an Engineering problem with the help of case studies.

### ***Day 2 Session 2***

**About the Speaker:** Dr. Dattaji K Shinde is an Associate Professor in Production Engineering Department in VJTI. He has complete his Ph. D. in 2014 from North Carolina A

and T State University USA in Nano Engineering. He has completed his M.Tech from IIT, Delhi in Design Engineering in 2002.

His research interest are Process Modeling in composites, Nano Engineered Materials and nanotechnology, Electrospinning, Molecular Dynamic Simulations, Multifunctional Materials, Low Cost Composite Manufacturing (VARTM Processing) and Mechanical Characterization of Materials, Computer Aided Design and Modeling, Finite Element Modeling and analysis, Fatigue, Impact Modeling and Testing of Polymeric Composites, Ceramic Composites, and Textile Composites, Micromechanics Modeling and Testing, Single Fiber Modeling and Testing, Design of Mechanical system, Micro/Nano manufacturing etc.

### **About the Session:**

The topic of the session was “Nanotechnology” and session has started with the introduction of the topic. Students got the insights about nanotechnology, process involved, importance of Nano technology and Nano materials, Lithography etc.

### **Day 3**

**About the Speaker:** Dr. A. W. Date is Emeritus Fellow & First Rahul Bajaj Chair Professor, Department of Mechanical Engineering in IIT Powai. He has been with IITB since 1973. He recently has been awarded with the IITB-Lifetime Achievement Award-2012, in recognition of his outstanding contributions as a teacher, researcher and administrator.

Prof. Date graduated from VJTI, Mumbai in 1967, and earned a masters degree from Univ. of Manchester. He completed his Ph. D. from Imperial College, London in 1973, and joined IIT Bombay. Prof. Date is a Fellow of the Indian National Academy of Engineering (FNAE), 2001.

He is a recipient of Excellence in Teaching Award – 2006, IIT Bombay. He has made significant contributions in the field of rural technology development and has inspired several generations of students to work on problems of rural areas. He is the founder and current Head of the Centre for Technology Alternatives for Rural Area (CTARA) and has been instrumental in the growth of the Center into a full-fledged academic entity that offers Master's and Doctoral programmes.

Dr. Date's academic interests are in the fields of Heat and Mass Transfer with and without Phase Change, Computational Fluid Dynamics, Appropriate Technology and Technology-Development Issues. His teaching and research experience has resulted in two excellent textbooks titled "Introduction to Computational Fluid Dynamics" and "Analytic Combustion", published by the Cambridge University Press.

#### **About the Session:**

The topic of the session was "Mechanical Engineering: Brief Appreciation, Random Reflections on fun, Creativity & Responsibility". The whole session was dedicated to rural development and role of mechanical engineers for development of rural areas. Rural areas has various problems and mechanical engineers can be useful. Sir has given the information about the projects which have done under his guidance for the development of rural areas. One of his innovations was '*Chulha*' and its performance.

#### ***Day 4***

**About the Speaker:** Mr. N. B. Kulkarni is a Head of Engineering Department in TOYO Engg. India ltd., Mumbai.

#### **About the Session:**

Session has started with the topic entitled "Industrial applications of Heat Exchangers." Students got enlightened about types of heat exchangers, what all are the inputs, design properties, standardization formats, process license etc.

#### ***Day 4 Session 2***

Session has started with the inaugural function of SAE SUPRA- MGM Accellors team's website and brochures. Website was inaugurated by our Respected Principal Dr. S. K. Narayankhedkar followed by written and oral feedback from students. Finally there was certificate distribution to our students.

## **PARTICIPANTS**

The workshop was well attended. There were 48 participants in the workshop. The participants were invited from final year and third year from Department of Mechanical Engineering. The students had teaching experience and practical background in various domain of Mechanical Engineering. The list of participants is attached as Annex A-2.

## **FEEDBACK & SUGGESTIONS**

We have received very positive feedbacks from our students. Students were encouraged, moved and highly influenced from all the speakers. All students have got the perfect idea about basics of Mechanical Engineering and different approaches to solve the problems. This workshop has changed the point of view of students about society and nature. They have learned the basic life skills also and changed the way of seeing problems.

As suggestions, students wrote that they wanted to have a session more than 2 hours. They want workshop on automobile, fluid mechanics & design.

## Annex A- 1

### WORKSHOP SCHEDULE

<b>Date</b>	<b>Session -1 10:30-12:30</b>	<b>Session-2 1:30-4:00</b>
19/12/17	Finite element method, Constitutive modeling and applications  <b>Speaker:</b> Dr.Chandrakant Desai	Life Skills for Engineers  <b>Speaker:</b> Mr. Rajesh Kothari
20/12/17	Experimental approach in Mechanical Engg  <b>Speaker:</b> Dr. Sandeep Joshi	Nanotechnology  <b>Speaker:</b> Dr. D. K. Shinde
21/12/17	Mechanical Engineering: Brief Appreciation, Random Reflections on fun, Creativity & Responsibility  <b>Speaker:</b> Dr. A. W. Date	
22/12/17	Industrial Applications Of Heat Exchangers  <b>Speaker:</b> Dr. N. B. Kulkarni	



## Annex A- 2

### LIST OF PARTICIPANTS

Sr. No.	Uid Number	Name Of The Student
1	114ME1514A	Jain Sachin Manojkumar Sushiladevi
2	114ME1477A	Jain Sagar Manish Kumar Geeta
3	114ME1530A	Lasiyal Pramod Dinesh Rekha
4	114ET1089A	Nandimandalam Rohith Varma
5	114ME1185A	Patel Mayur Chandulal Sarla
6	112ME1758	Thakur Aditya Harishankar Kanchan
7	114ME1551A	Yadav Rahul Sureshchand Urmiladevi
8	113ME1388B	Jadhav Mithun Vilas Aditi
9	414ME1125A	Jain Dipesh Dinesh
10	414ME1573A	Modake Pundalik Parshuram Pramila
11	414ME1203A	Patil Shivam Gambhir
12	414ME1287A	Patil Sohal Suresh Latika
13	414ME1379A	Sufiyan Shaikh
14	414ME1560A	Shetty Suraj Chitresh Sangeeta
15	415ME3059A	Shinde Avinash Popat
16	415ME3339A	Shinde Mahadev Laxman
17	414ME1212A	Yadav Kamal Rajesh Jantadevi
18	415ME3348A	Yadav Pankaj Ramchandra
19	414ME1346A	Yadav Sagar Shivaji
20	414ME1583A	Vikesh Patil
21	414ME1538A	Gagandeep Singh Gurcharan
22	414ME1615A	Qureshi Faizan
23	114ME1529A	Pamecha Ankush Vinod
24	115ME1394A	Yadav Avinash
25	115ME1222B	Ghate Sharvari
26	115ME1071A	Wabale Hrishikesh
27	115ME13031B	Neman Namita
28	115ME1052B	Kadam Komal
29	115ME1169A	Jog Shubham
30	115ME1143B	Yelvikar Karishma
31	415ME1188A	Varhadi Siddharth Dattatray
32	415ME1150B	Vishakha Vitthal Haral
33	416ME2031A	Katdere Devendra Balkrishna
34	415ME3024A	More Nitesh Vishwanath
35	411ME1792	Phuke Kumar Rajaram
36	413ME1353B	Pednekar Sonali Shrikant

**Annex A- 3**

**LIST OF EMINENT EXPERTS**

1. **Dr. Chandrakant Desai**  
Regents Professor,  
The University of Arizona,  
Tucson, AZ, USA
2. **Mr. Rajesh Kothari**  
Venture Capitalist,  
Angel Investor,  
Software professional,  
Tata Unisys Ltd (now merged into TCS)
3. **Prof. Sandeep Joshi**  
Vice-Principal  
Pillai College of Engineering,  
New Panvel
4. **Dr. D. K. Shinde**  
Associate Professor  
Production Engineering Department  
VJTI
5. **Prof. A. W. Date**  
Emeritus Fellow  
First Rahul Bajaj Chair Professor  
Department of Mechanical Engineering  
IIT Powai
6. **Mr. N. B. Kulkarni**  
Head- Engineering Department,  
TOYO Engineering India ltd.  
Mumbai

**Annex A- 4**

**LIST OF ORGANIZING COMMITTEE**

**1. Prof. Sanjay Bhandari**

Convener

Head of Department,

Department of Mechanical Engineering,

MGM CET

**2. Prof. Priyanka Verma**

Coordinator

**3. Prof. Nilesh Bodkhe**

Co-coordinator

**4. Prof. Chaitanya Rothe**

Member

**5. Prof. Rajaysh Meshram**

Member

**6. Prof. Mahesh Mange**

Member

**7. Prof. Mainak Bhaumik**

Member

**8. Prof. Pragati Singh**

Member

**9. Prof. Basanagouda Patil**

Member

## Annex A-5

### FEEDBACK FROM PARTICIPANTS

The following feedback form was given to participants to evaluate the workshop. The responses are tabled in a graph in the following page. 1 represents the worst and 5 the best possible ratings.

Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The objective of the program clearly defined.					
Participation and interaction were encouraged.					
The topic covered were relevant to me					
The content was organized and easy to follow.					
This experience will be useful in my work.					
The ROME 2K-17 objectives were met.					
The time allotted for each session was sufficient.					
The trainer was knowledgeable about the program topics.					

Q. What did you like most about this program?

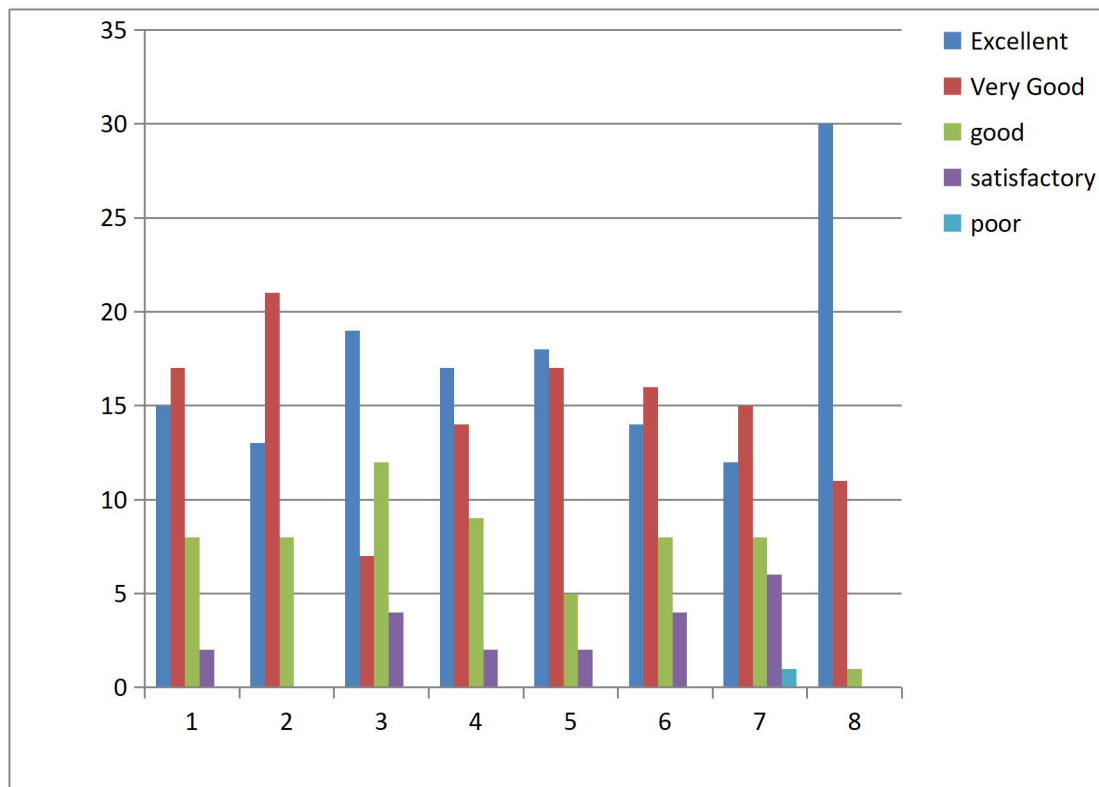
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## Annex A-6

### EVALUATION OF FEEDBACK

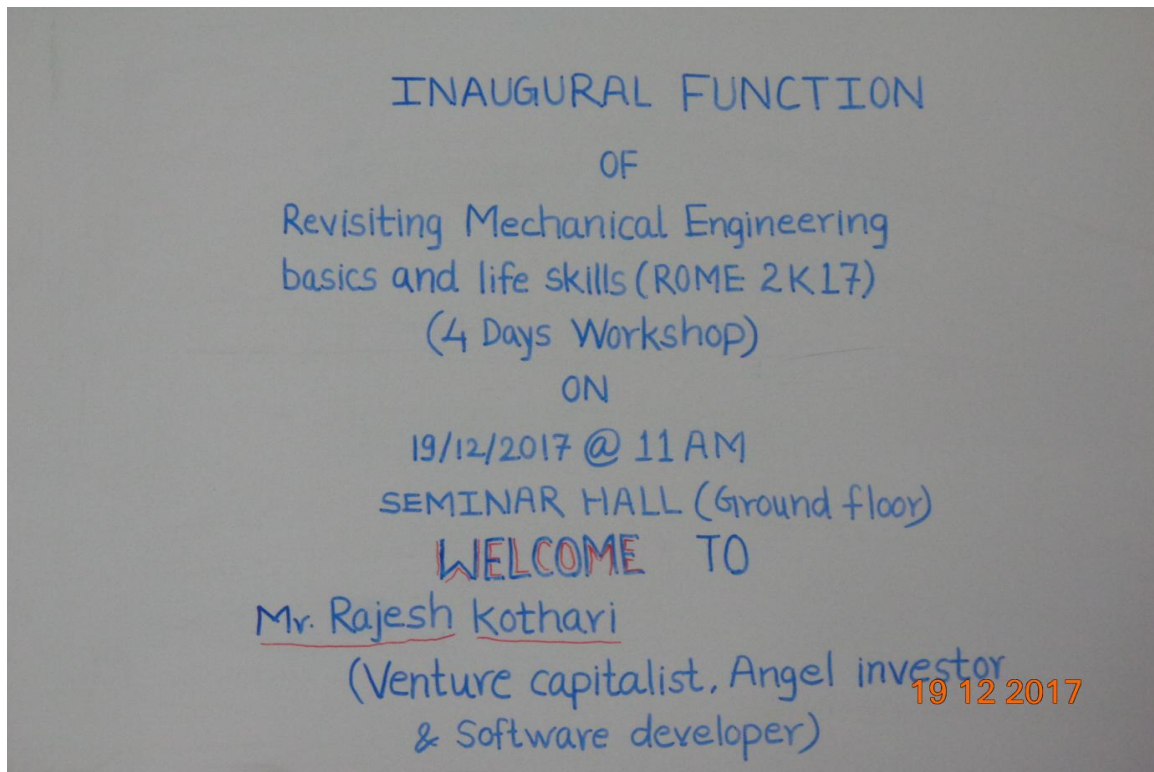
#### Results of Evaluation:

- Training programme was excellent but it should be for a longer duration.
- More emphasize should be given on practical sessions.
- These programmes are very useful. Similar workshops should be organized at different levels.
- Course structure should be further simpler.



**Annex A-7**

**PHOTOS OF WORKSHOP**







Revisiting Basics Mechanical Engineering & Life Skills  
MGM CET, Kamothe, 19-22 Dec 2017





