MGM's College of Engineering, Nanded
Near Air-port, Hingoli Road, **Nanded-431605.**
Department of Mechanical Engineering

Innovations by the Faculty in Teaching and Learning

The use of innovative methods in teaching and learning has the potential to improve education, empower students, strengthen governance, and galvanize the effort to achieve the students' development. Innovative practices are introduced in teaching-learning to raise the curiosity of students in a wide domain to encourage the students to question and to increase the interactions during the sessions.

All these innovative methods adopted in teaching-learning, on a long term basis help students to build Team spirit, Moral principles, Social responsibilities, Information sharing, and develop the skill of organizing college and intercollegiate events etc. The evidence of the success of innovative practices is visible both qualitatively as well as quantitatively. The qualitative factor improves etiquettes and desire to understand. Also, it will help to change the overall perspective towards life. The quantitative factor improves academic performance and motivates participation in co-curricular and extra-curricular activities.

Following are the innovative practices undertaken by the faculty members of the Department of Mechanical Engineering, for improving teaching and learning process.

The innovative practices are made available on the Institute web site for reference and review, the link for which is as below: https://mgmcen.ac.in/mechanical-engineering/consultancy.aspx

Following is the list of Teaching Learning Methods

Sr. No.	Teaching Learning Methods	Activity Carried out
1	3D and Cut Sectional model	Prepared 3D and Cut Sectional model
2	Learning by Doing	Independently develop products
3	Project-Based Learning	Students are getting practical exposure by various machines
4	Flipped Classroom	Blended learning which focuses on students' engagement in active learning
5	ICT based teaching learning	Google Classroom YouTube and NPTEL links
6	Students Symposium	VisioTech Event every year organizes by institute
7	Industry Institute interaction	Industry Institute meets, MOUs, Industrial visits
8	Expert Talk / Guest Lecture	Industry/ Academic expert delivers talk
9	Quiz	Activity taken online and offline
10	Group Discussion	Activity taken batchwise

1. 3D and Cut Sectional Model

Engineering Graphics: The development of imagination is a crucial step in the learning process. 3D models and its demonstration makes it easy to understand and visualize which helps in developing thinking ability during drawing views of the objects. In a class review, students have suggested that interaction with such a method led to a better understanding of the engineering drawing in orthographic projection and Isometric views.

We have designed 3D model by using Unigraphics software for better understanding and to improve the imagination power of students. Students can see the model and able to draw their views.

Here are some 3D models for illustration:

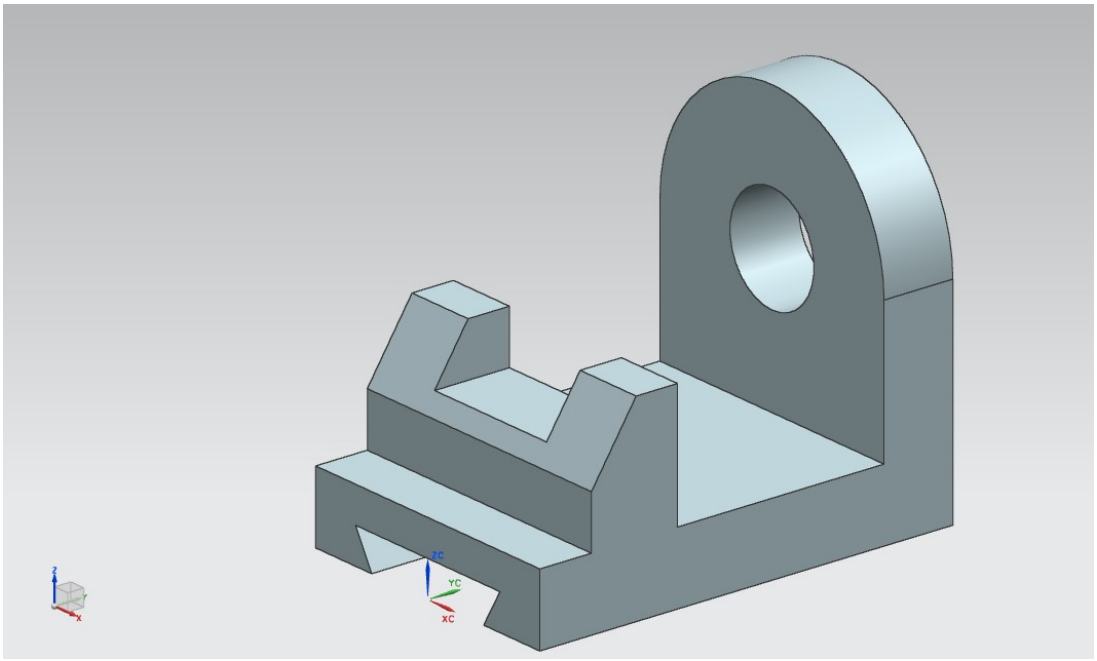


Fig1: 3D View of the Object

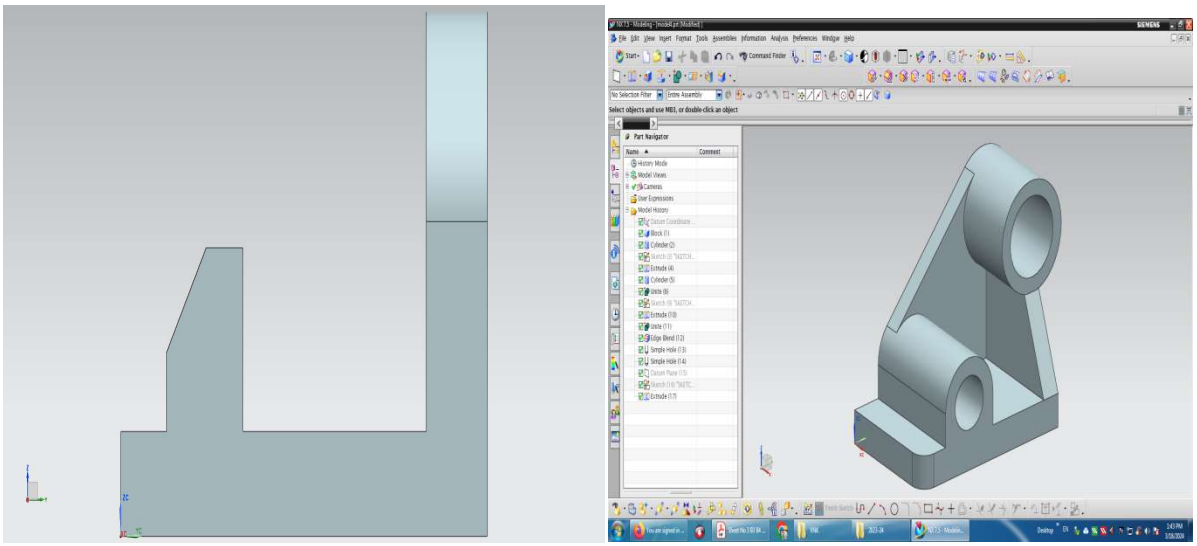


Fig2: Front View and 3D view of the Object

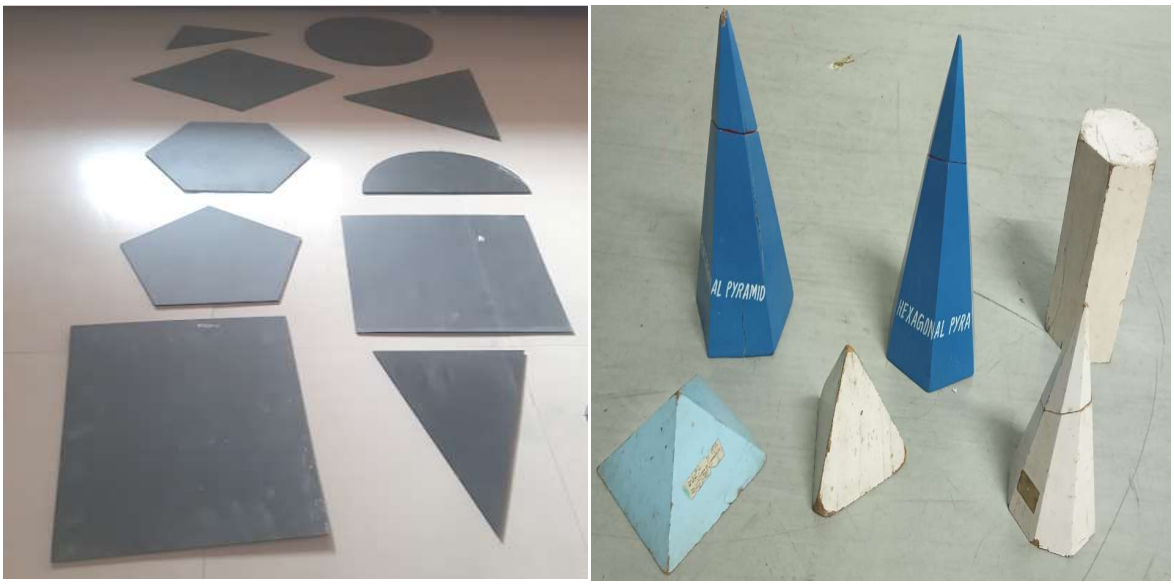


Fig 3: Prepared Planes and Solids

2. Learning by Doing

The goal of this activity to independently develop products from inception to completion. The Learning by doing is an educational approach where students actively get involved in creating new model. This fosters creative thinking as students independently develop a product from its inception to completion. Following model from the fluid mechanics subject is given to learn its practical working. The students have prepared this model in Additive manufacturing laboratory. The students got experience by manufacturing this working 3d model on 3D printed machines.

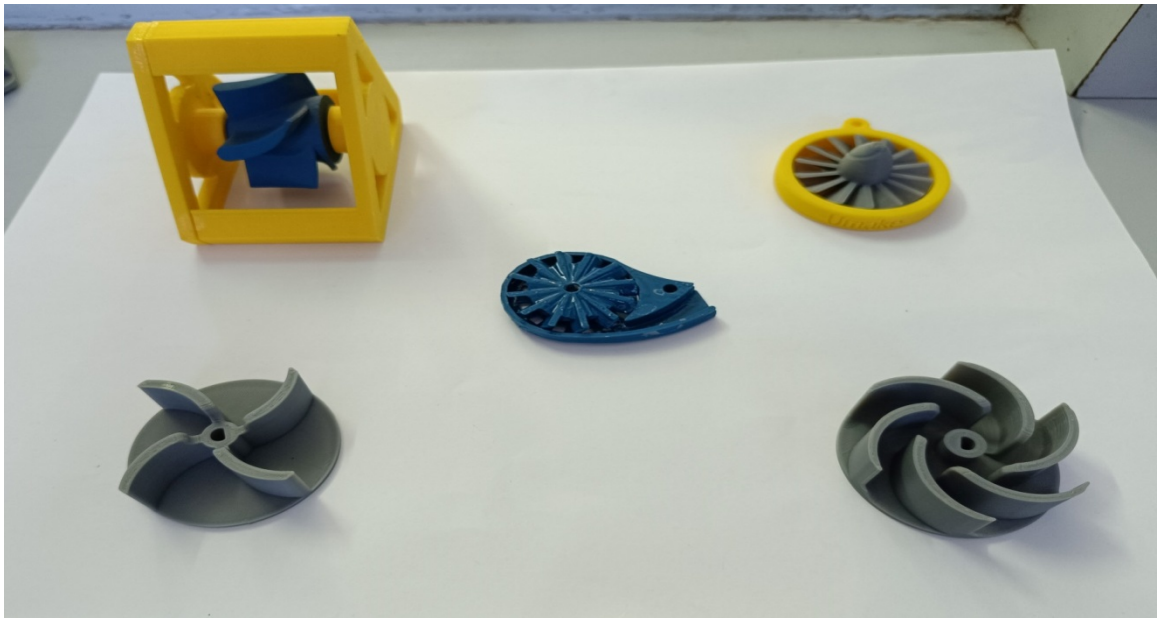


Fig: 3D printed Turbines

3. Project based Learning:

3D printing or additive manufacturing is the construction of a three-dimensional object from a CAD model or a digital 3D model. It can be done in a variety of processes in which material is deposited, joined or solidified under computer control, with the material being added together (such as plastics, liquids or powder grains being fused), typically layer by layer. In the mini project group of maximum two students are allotted to prepare working model or application oriented project. Following projects are prepared bystudents under the guidance of Mr. A I Rehman and Dr. R. S. Hingole.

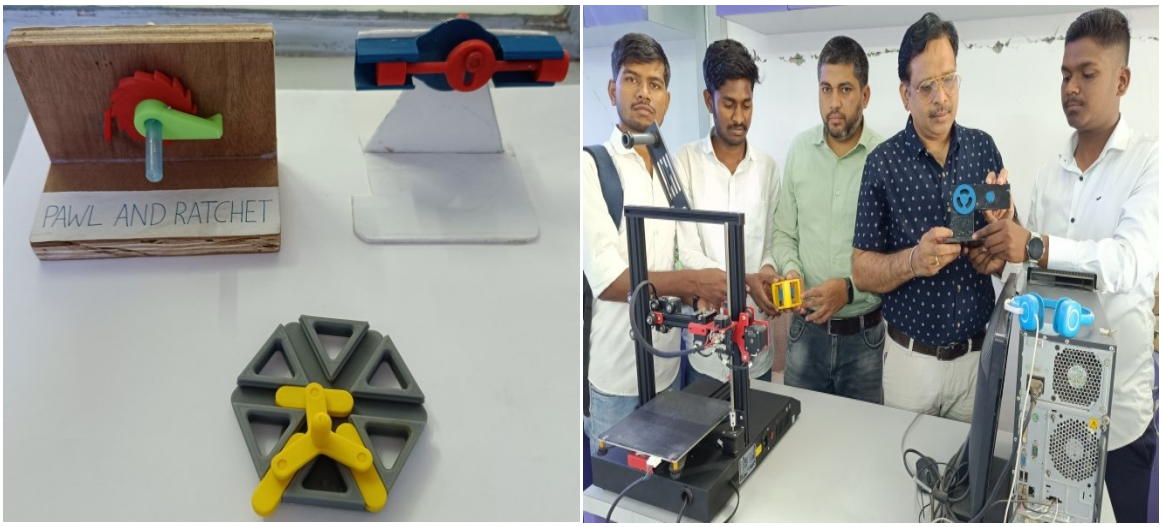


Fig: Mini Project working Model

4. Flipped Classroom

A flipped classroom is an instructional strategy and a type of blended learning which focuses on students' engagement in active learning, giving the instructor a better opportunity to deal with mixed levels. Students are given their choice to prepare a topic and make presentation the class in front of the instructor. Faculties of the Department of Mechanical Engineering, adopt this practice for improving the interaction between the students and make it a joyful teaching-learning experience.

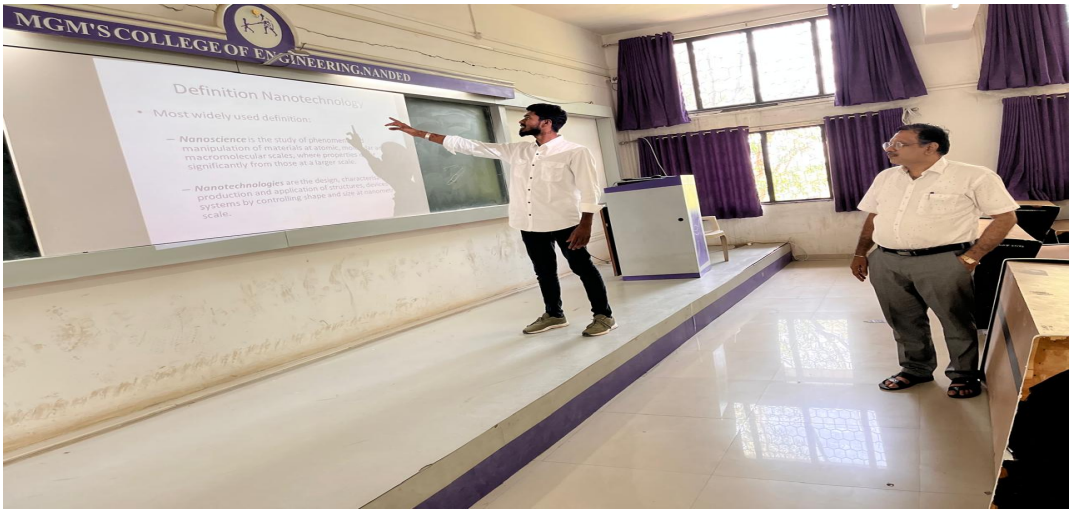


Fig: TY Student Attar Hussain taking flipped classroom of subject Nanotechnology, 5/03/2024

Fig: TY Student Attar Hussain taking flipped classroom, all students

5. ICT based teaching learning

ICT Based Teaching Learning: The ICT tools we use in the department:

I. Google Classroom

II. NPTEL videos / Swayam

III. Moodle / Spring board

IV. You tube

V. ERP(http://mgmerp.ac.in/adminlogin_.aspx)

VI. ICT enabled Classroom

VII. Microsoft Teams

VIII. Google Forms

IX. WhatsApp

X. Virtual Lab

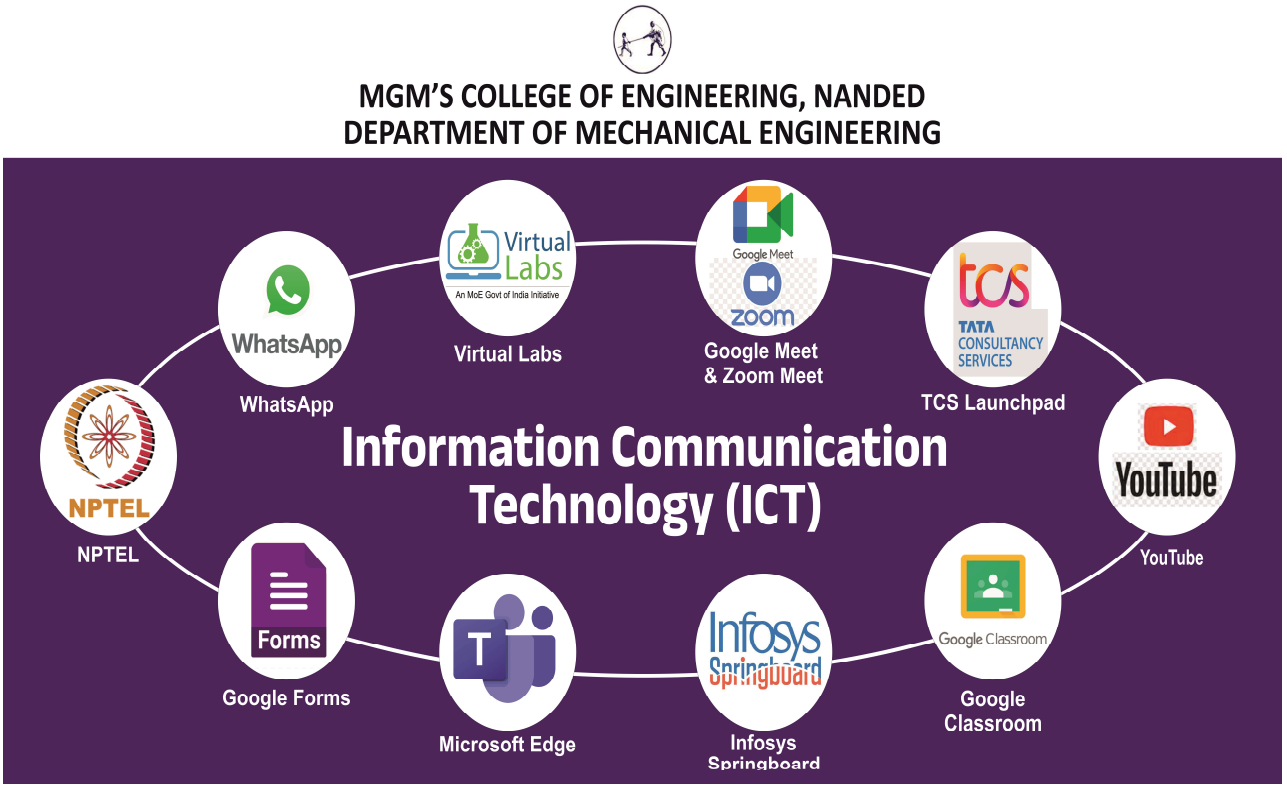


Fig: ICT based teaching learning tools

I. Google Classroom:

Google classroom for subject **Finite Element Method** is created. This Google classroom is helpful for students to learn from any location. It helps to share teaching material like power point presentation, lecture videos and distribute the assignments to all students. This also enhances the communication with the students by using announcements, comments and messaging features of Google Classroom.

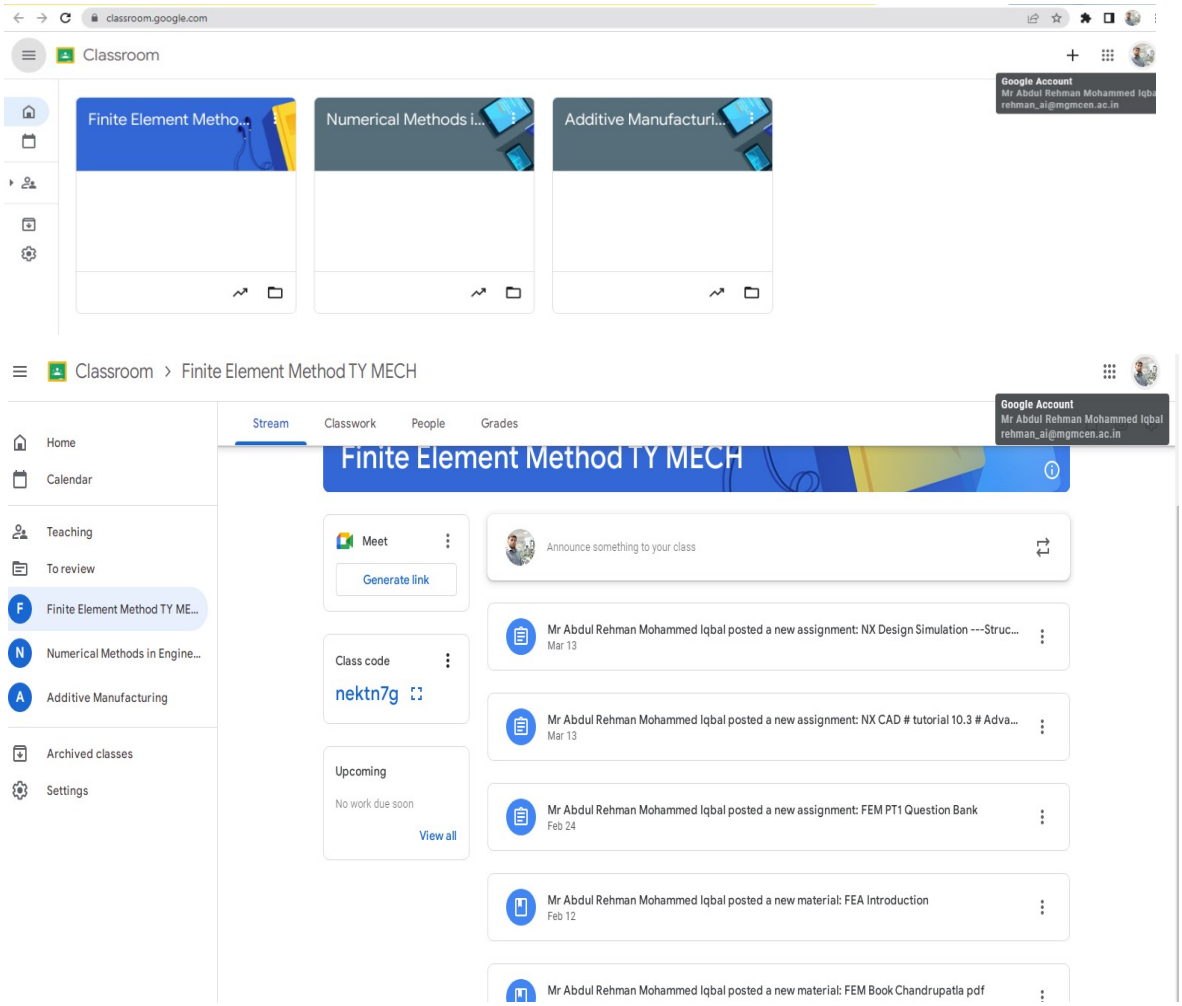


Fig: Google classroom notes/PPT

II. YouTube Channel:

Few Faculties have created their own YouTube channels where they uploaded video lectures, study material relevant to their subjects. The links are shared with the students and the contents are openly accessed by all students. Faculties used You Tube for giving assignments and study material. Dr. R. S. Hingole, have created You Tube channel with link https://www.youtube.com/watch?v=VgutyHjrsOE. He has uploaded video lecture related to Machine Design course.

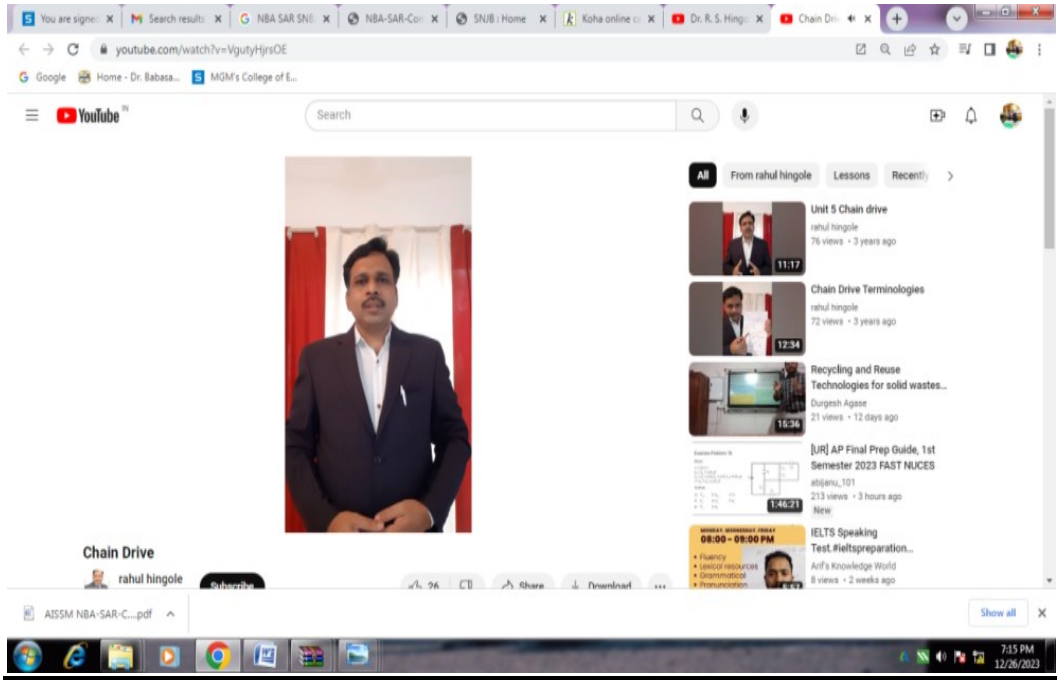


Fig: Dr. R. Hingole have created above You Tube Chanel for Machine Design course

Dr. R. S. Hingole, have created You Tube channel with link https://www.youtube.com/watch?app=desktop&v=JzKYM-kvRW0 for second year mechanical engineering student for the subject Constitution of India.

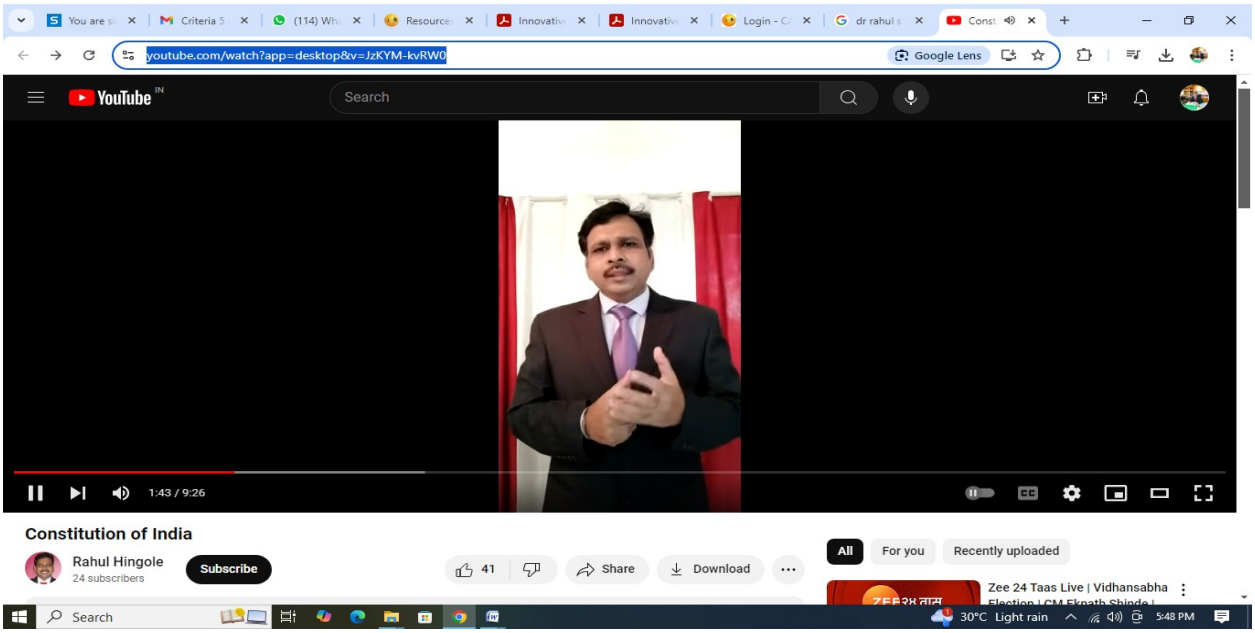


Fig: Dr. R. Hingole have created above You Tube Chanel for Constitution of India course

Dr. R. S. Hingole, have created You Tube channel with link https://www.youtube.com/watch?v=Xe4PJzakX04 for final year mechanical engineering student for the subject Entrepreneurship Development.

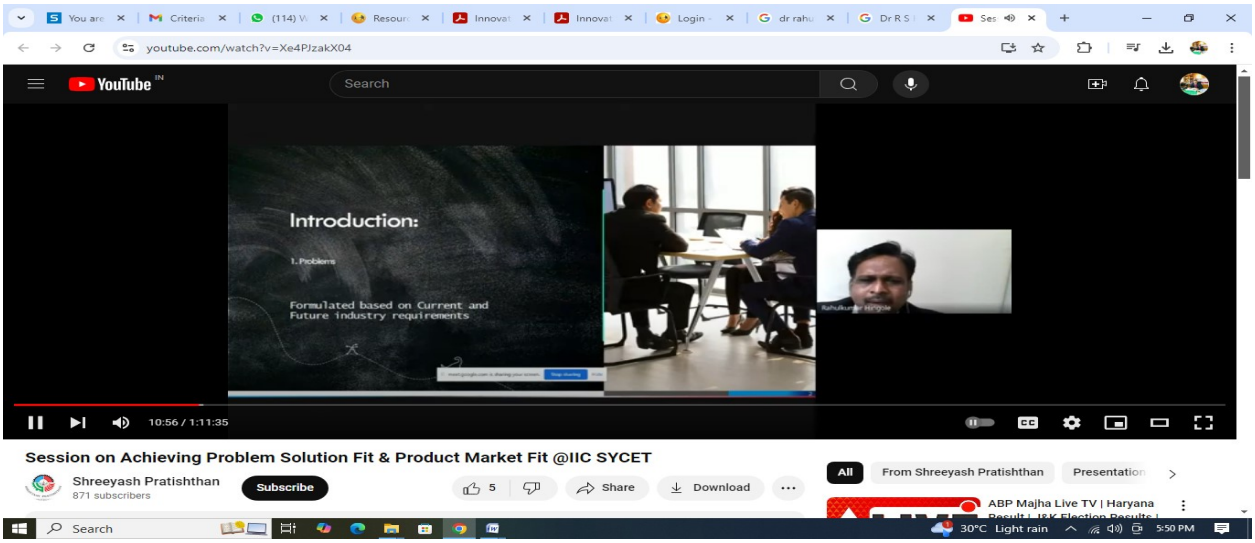


Fig: Dr. R. Hingole have created above You Tube Chanel for Entrepreneurship Development course

III. Word Press Website:

Word Press is widely regarded as one of the best **c**ontent management systems (CMS) in today's market. This websites used as platform to share course material on it. Few Faculties have created their website where they uploaded video lecture, study material relevant to their own subjects. Dr. R. S. Hingole, have created website with link https://www. https://rshingole.wordpress.com/. He has uploaded video lecture related to Design of Machine Element course.

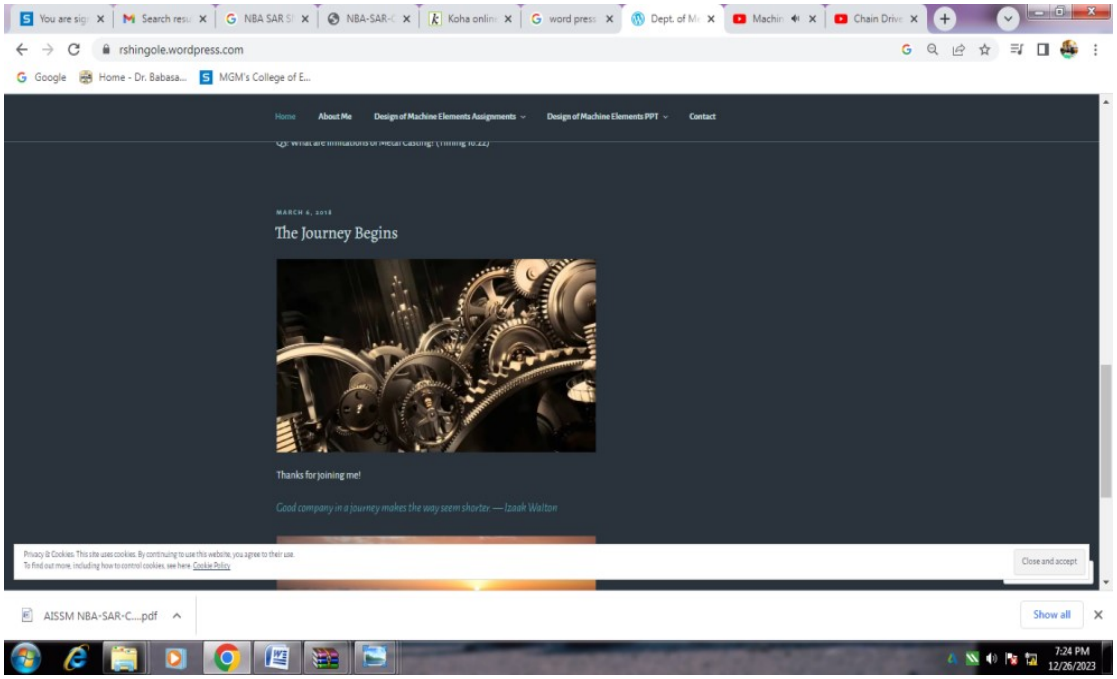


Fig5.10: Dr. R. Hingole have created word press website

Outcome:

1. You tube video has helped students to learn and understand the course in a better and effective way.
2. The students can learn at their own pace and at own convenience apart from classroom learning. This provides students, the opportunity for self-study.

IV. NPTEL VIDEOS/ SWAYAM

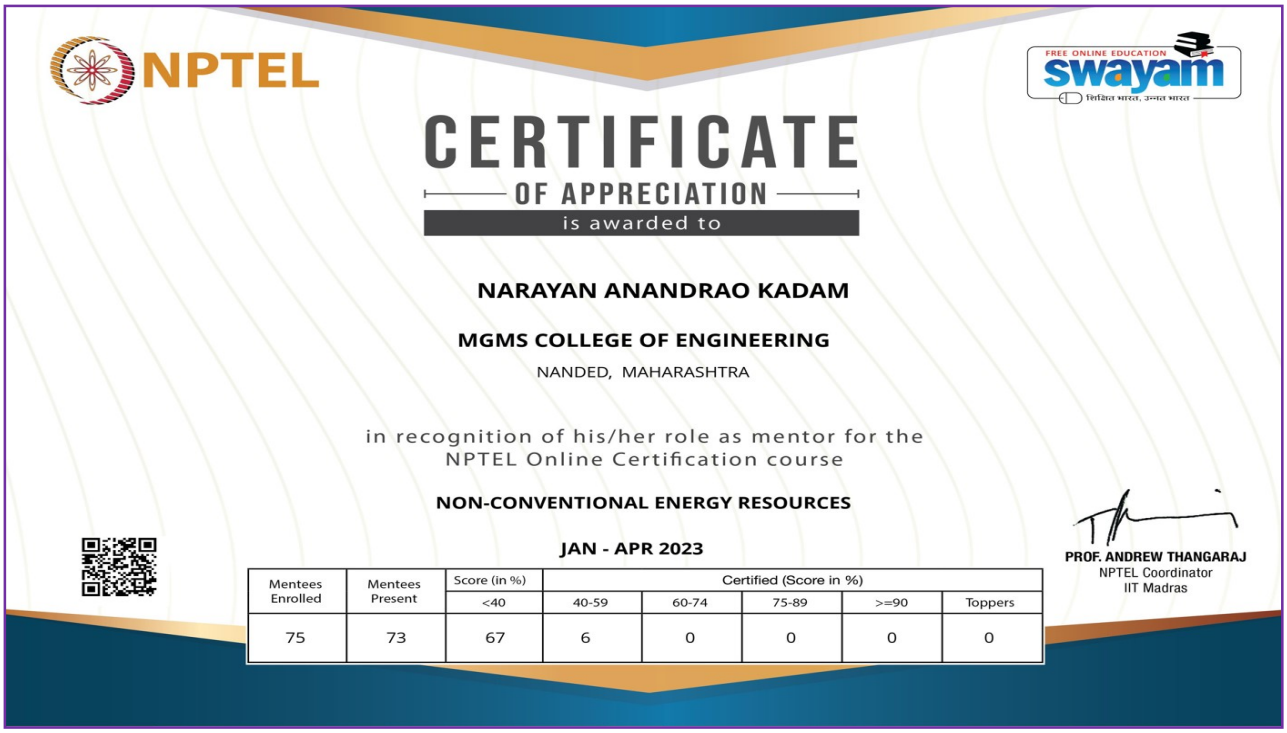
Technology Enhanced Learning is a trend in Higher Education. There are several government initiatives in India towards e-learning. National Programme on Technology Enhanced Learning (NPTEL)/ **SWAYAM** are the major initiatives. Faculties of the Department of Mechanical Engineering, upgrade their knowledge and enhance skill by completing such course, and output is reflected in their improved teaching. Faculties also encourage students to enroll for such a program to get additional inputs for the respective subject.

Name of SWAYAM Local Chapter:		**MGM's College of Engineering, Nanded (LC 3300)**		
Name of SPOC SWAYAM LC:		Dr. Mohd. Zameeruddin		
Email Id of SPOC SWAYAM LC:		mgmcen.nptelspoc@gmail.com		
SPOC SWAYAM LC: Mobile No.		9822913231		
Whether the SWAYAM schedule is circulated to students:		Yes, SWAYAM Committee circulates the same		
Maintenance of SWAYAM viewer's register:		Yes, each departmental coordinator maintains the records course-wise and mentor-wise		
	AY 2019-2020	**AY 2020-2021**	**AY 2021-2022**	**AY 2022-2023**
July-Dec (Odd Semester)				
Number of students Enrolled	LC started from Jan 2020	1504	1722	483
Number of students registered for examination		127	28	99
Number of students certified		38	13	18
Number of courses offered		8	15	04
No. of mentor allocated		10	18	04
Jan-April (Even Semester)				
Number of students Enrolled	1203	1722	483	1214
Number of students registered for examination	144	437	303	567
Number of students certified	139	08	162	307
Number of courses offered	15	04	09	10
No. of mentor allocated	06	04	09	12

List of SWAYAM/NPTEL Course (Jan –Apr 2023) Academic Year 2022-23

Sr. No.	Name of Mentor	Name of Course	Duration of Course (Weeks)	Start date	End date	No. of Student Enrolled	No. of Student Appeared	No. of Student received Certification
1	Prof. S. G. Salve	Introduction to Industry 4.0 and Industrial Internet of Things	12	23.01.2023	14.04.2023	77	54	54
2	Prof. A. A. Bhore	Maintenance and Repair of Concrete Structures	12	23.01.2023	14.04.2023	75	72	34
3	Prof. S. D. Halbandge	Soil Structure Interaction	12	23.01.2023	14.04.2023	75	72	48
4	Prof. J. S. Sidhu	Fundamental of Automotive System	12	23.01.2023	14.04.2023	75	73	37
5	Prof. R. G. Bisen	The Joy of Computing using python	12	23.01.2023	14.04.2023	54	16	13
6	Prof. S. S. Anwar	Introduction to Internet of Things	12	23.01.2023	14.04.2023	31	12	12
7	Prof. J. S. Kale	Social Networks	12	23.01.2023	14.04.2023	77	56	31
8	Prof. M. N, Bhandare	The Joy of Computing using paython	12	23.01.2023	14.04.2023	74	15	8
9	Dr. M. Y. Joshi	Social Networks	12	23.01.2023	14.04.2023	69	42	24
10	Prof. N. A. Kadam	Non-Conventional Energy Sources	12	23.01.2023	14.04.2023	75	73	06
11	Prof. M. R. Banwaskar	Computer Vision and Image Processing: Fundamentals and Applications	12	23.01.2023	14.04.2023	23	09	01
12	Prof. M. R. Chennoji	Introduction to Industry 4.0 and Industrial Internet of Things	12	23.01.2023	14.04.2023	69	42	39
					Total	**774**	**536**	**307**

Sample copy of certificate is attached



NPTEL

FREE ONLINE EDUCATION swayam

CERTIFICATE

OF APPRECIATION

is awarded to

NARAYAN ANANDRAO KADAM

MGMS COLLEGE OF ENGINEERING

NANDED, MAHARASHTRA

in recognition of his/her role as mentor for the NPTEL Online Certification course

NON-CONVENTIONAL ENERGY RESOURCES

JAN - APR 2023

Mentees Enrolled	Mentees Present	Score (in %)	Certified (Score in %)				
		<40	40-59	60-74	75-89	>=90	Toppers
75	73	67	6	0	0	0	0

PROF. ANDREW THANGARAJ
NPTEL Coordinator
IIT Madras

Outcome:

a. Remote-access to simulation-based Labs in various disciplines of Science and Engineering.
b. Use of virtual labs inspires students to conduct experiments with their curiosity. This helps them in learning basic and advanced concepts through remote experimentation.
c. It provides a complete Learning Management System around the Virtual Labs where the students/ teachers can avail the various tools for learning, including additional web-resources, video-lectures, animated demonstrations and self-evaluation.

6. Students Symposium (VisioTech):

Activity: National Level Technical Event, Visiotech 2024,

Date: 27, 28 March 2024

Name of guest: Dr. Manohar Chaskar Vice Chancellor, SRTMU Nanded

VISIOTECH is an Event which is conducted every year to provide platform for budding engineers to exhibit their talent and skills in various events and competitions organized. The name VISIOTECH was coined as it represents Vision of Technocrats. VISIOTECH will be packed with multiple events testing knowledge and capabilities of would be engineers.

Fig1: Dr. Manohar Chaskar Vice Chancellor, SRTMU Nanded and all HoD's during VisioTech 2024

For the inauguration of this event chief guest Dr. Manohar Chaskar Vice Chancellor, SRTMU Nanded and All the Head of Department were present. Our Honarable Chairman Mr. Kamal Kishor Kadam, Respected Director Dr. G. S. Lathkar have given wishes for this event. Dr. Manohar Chaskar was serving as the Dean (Incharge) Faculty of Science and Technology at Savitribai Phule Pune University and Principal of Prof. Ramkrishna More College, Pune.

Dr Manohar Chaskar (DoB 30 Oct. 1966) obtained his M.Sc. and Ph. D. in Chemistry from Savitribai Phule Pune University. He has vast experience of teaching, research and administration. He has participated and presented work in the more than 30 National and International conferences. He has organized more than 10 National and International conferences as coordinator/convener.

Fig2: Dr. S. L. Kotgire doing inauguration Visotech 2024 events of Mechanical Engg. Dept and Allfaculty members and students

The following events are organized through VisioTech 2024. Dr R. S. Hingole have worked as Departmental coordinator for this Visiotech 2024.

1. **CNC PROGRAMMING** :
   Dr. P. D. Machkale have worked as coordinator for this event. CNC programming (Computer Numerical Control Programming) is utilized by manufacturers and industrial experts to create program instructions for computers to control a machine tool. CNC is highly involved in the manufacturing process and improves automation as well as flexibility. The **PO5: Modern tool usage is mapped though this event.**
2. **DRONE TECHNOLOGY** :
   Mr. C.V. Bandela have worked as coordinator for this event. Drones are a combination of hardware and software components to achieve successful takeoff, flight and landing. Drones are equipped with rotors or fixed wings, sensors, navigation systems and gyroscopes, and are operated by ground control stations.

The **PO5: Modern tool usage, PO5: Modern tool usage, PO9 are mapped though this event.**

3. **CAD WAR** :
   Mr. P.M.Pahinkar have worked as coordinator for these event. World of designing is running more than the speed of light. Now it's time to express your imagination power through CAD. Here "CAD WAR" is challenging your designing brilliance.

The **PO5: Modern tool usage is mapped though this event.**

4. **ELECTRIC VEHICLES** :
   Mr. A.I.Rehman have worked as coordinator for this event. An EV includes both a vehicle that can only be powered by an electric motor. A vehicle can be powered by an electric motor that draws electricity from a battery and by an internal combustion engine (plug-in hybrid electric vehicle). The **PO9: Individual and team work, PO11: Project management and finance, PO12: Life-long learning are mapped though this event.**

5. **ROBOTICS** :
   Mr. V. N. Kamble have worked as coordinator for these event. Robotics is a branch of engineering that involves the conception, design, manufacture and operation of robots. The objective of the robotics field is to create intelligent machines that can assist humans in a variety of ways. The **PO11: Project management and finance, PO12: Life-long learning are mapped though this event.**

6. Paper/Poster/Project Presentation
   Mr. D. N. Hatkar have worked as coordinator for these event.
   Project Presentation: Be Creative!! Be Innovative!! Convert your ideas into actions; show your innovation to the world. You can present your skills and you work in front of expert.
   Poster Presentation:- Have you ever made your thoughts come into existence in front of your eyes? Now it is your chance to showcase your ideas through poster presentation. Here the participants will be able to bring their great created posters and show it to computer intellectual world and take away the prizes. So come and show your skills and ideas.

The **PO11: Project management and finance, PO10: Communication PO12: Life-long learning are mapped though this event.**

Fig3: Student event Coordinator for Visiotech2024.

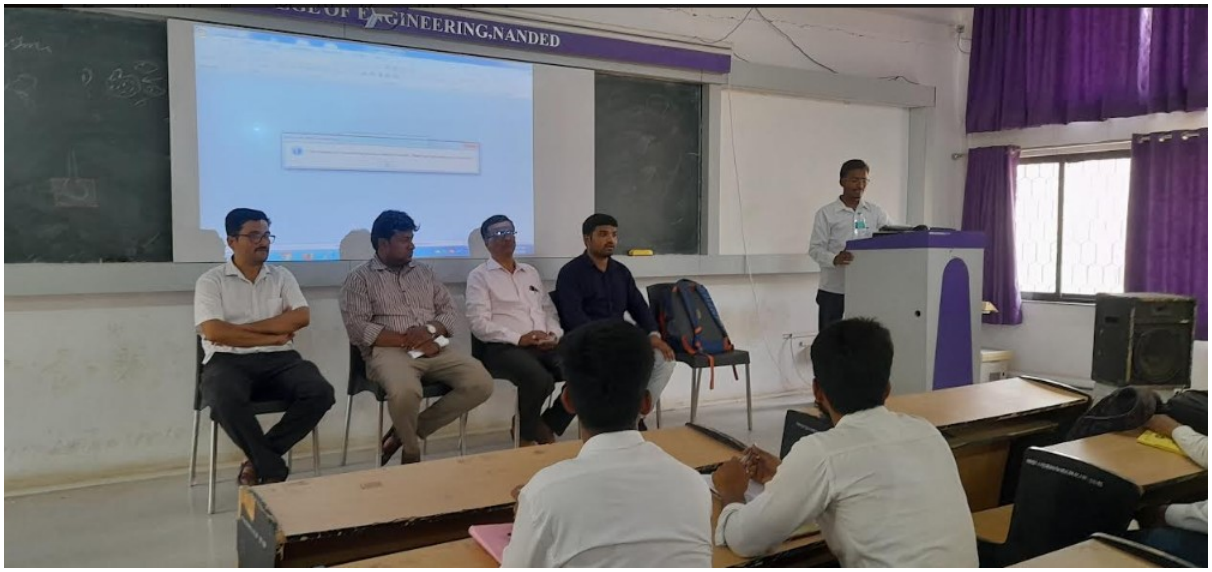
This Visiotech 2024 have successfully completed with vote of thanks by Dr Harshad HasmiSir.

8. Expert Talk / Guest Lecture

Industry / Academia Expert Lectures (an innovative tool for updating knowledge)

The objective of industry/academia expert lectures is to explore recent technology and development. Students get benefited to relate theoretical with practical inputs of recent changes in technology, also it upgrades knowledge with valuable information from their experiences. The students are bestowed with knowledge about Industry needs, latest technical updates, avenues for Higher studies, etc.

1. Guest Lecture by Mr. Shahid Shaikh (DNS ERP Private Limited) on topic Importance and working of ERP in industry on 27/05/2022



Mr. Shahid Shaikh delivering expert lecture

2. Guest Lecture by Mr. Ramakant Kulkarni (Director, Malgudi Institute of English Nanded.) on topic Importance of communication in day to day life and how to improve communication skill to face technical interviews and events on 06/06/2022.

Fig: Mr. Ramakant Kulkarni delivering speech on 06/06/2022

Fig: Mr. Ramakant Kulkarni, Dr M G Harkare and Students, 06/06/2022

9. Quiz Contest

A quiz contest is a fun and effective way to ensure that students actively participate to maximize knowledge. These competitions motivate and engage teachers and students to put their best foot forward. It also builds confidence in students after their active participations. A pro-active approach is developed in the students by undertaking these activities.

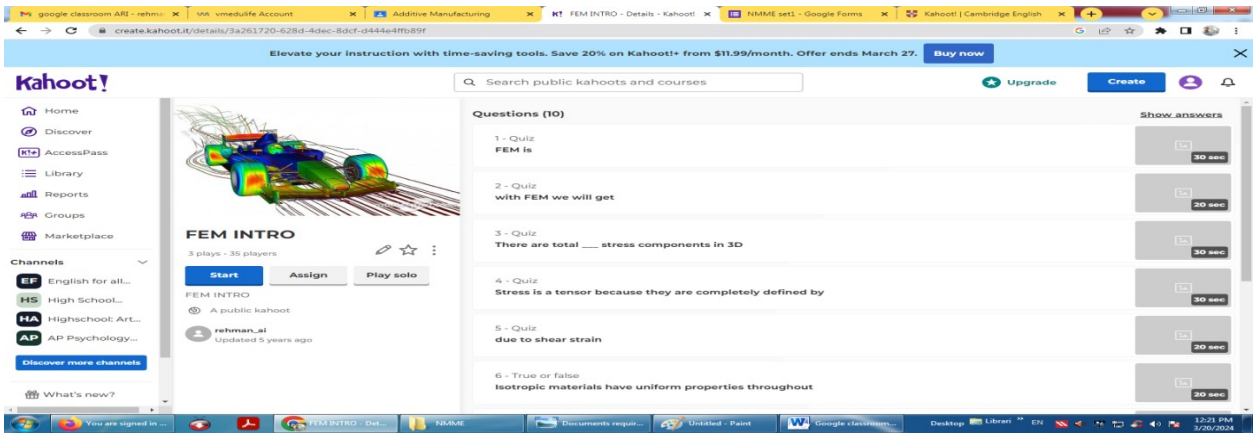


Fig: Quiz window for Students

National Level Technical Program

VISIOTECH 2023

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For the inauguration of this event chief guest Dr. M.B. Kokare , Director S.G.G.S. I E & T, Nanded, Our Honarable Chairman Mr. Kamal Kishor Kadam, Respected Director Dr. G. S. Lathkar & All the Head of Department were present.

Dr. M. B. Kokare has Completed BOYSCAST Post Doctoral Fellow from University of California Santa Barbara, USA on the topic Retinal Image Analysis/ Retrieval. He has Completed Ph.D. from Indian Institute of Technology Kharagpur, INDIA on the Topic Content- Based Image Retrieval. He Has Published 120 Research Papers, Invited talks in STTP/ Workshop/ Conferences: 400+.

Fig: Felicitation of chief guest Dr. M.B. Kokare by Hon. Chairman Mr. Kamal Kishor Kadam sir , andlamp lighting ceremony Respected Director Dr. G. S. Lathkar & All the Head of Department, Visotech 2023

VISIOTECH 2024

Activity: National Level Technical Event, Visiotech 2024,

Date: 27, 28 March 2024

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National Interactions

Fig: Dr. Geeta S. Lathkar Madam receiving National Award in the filed of Education

Fig: Hon. Chairman Shri Kamalkishorji Kadam, Dr. Geeta S. Lathkar Madam, Dr Manesh Kokare, Visiotech 2023

Prof. R. S. Hingole receiving Best Teacher Award, Pune 2022

Mr. Surdarshan Lathkar, Dr. R. S. Hingole, Dr. P. D. Machkale at SSIGMA Pune

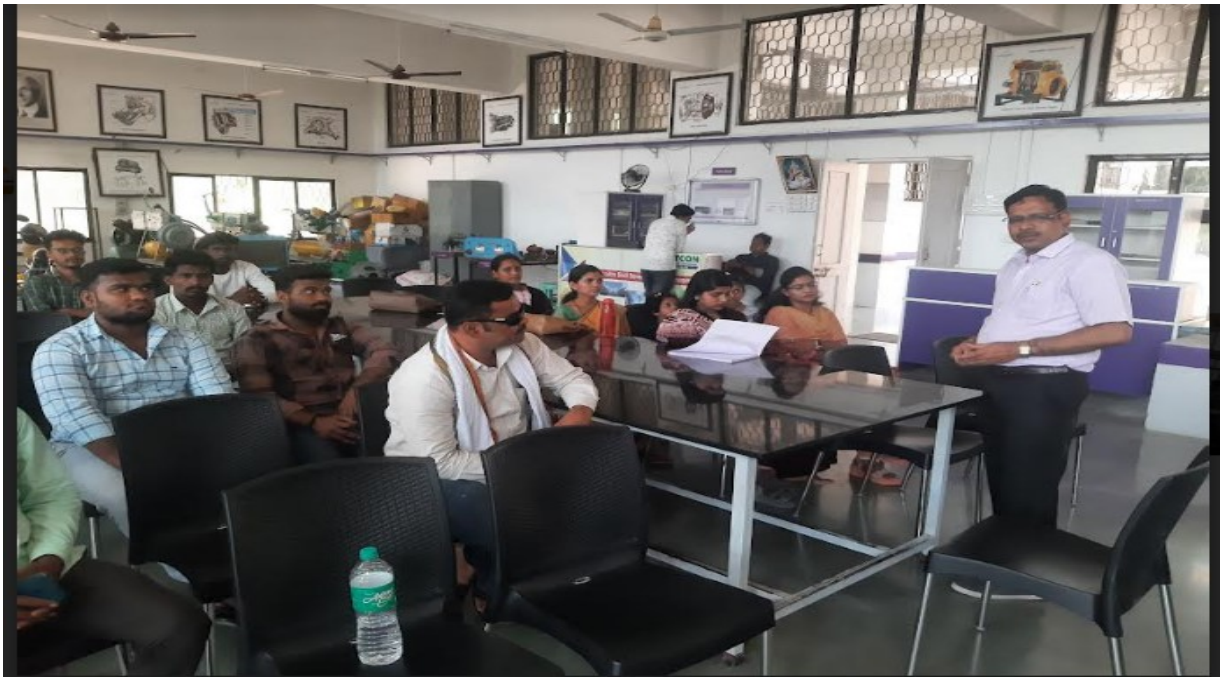

Fig: Dr. R. S. Hingole delivering session on EDP, MITCON

Fig: Dr. R. S. Hingole, Mr. Sandeep Pawar and all participants for MITCON session on EDP

International Interactions

Fig: Dr Geeta Lathkar and Shri. Kamalkishor Kadam, Hon. Chairman with Prof. Cornell Lehman, North Western University, Chicago

Fig: Dr Geeta Lathkar with renowned MGM Alumnus Mr Prashant Bhaduria, at HAL Bangalore

Fig: Prof. R. S. Hingole receiving Life Time Achievement Award from CITAX DMCC, Dubai UAE 2020