

K.D.K. COLLEGE OF ENGINEERING, NAGPUR

2021

NEWS-LETTER MECHANICAL DEPARTMENT



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Dr. C. C. Handa sir

Head of department of
Mechanical Engineering

“Always be a student, i.e., keep learning from different people and situations as everyone, and everything will teach you something. Besides, the more you learn, the more you know, enhancing your confidence.

Break your goals into smaller chunks. It will be easier this way to fulfill every part of that goal. This, in turn, will always keep you motivated to move forward. Keep a check on your patterns. Know what makes you feel demotivated and try to improve those situations or change your perspective.”



HEAD
Deptt. of Mech. Engg.
K.D.K. College of Engg., Nagpur-09

Faculty Editor



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Student Editor:



**Mr. Kashinath
Meshram**



**Miss. Pihu
Ghodeswar**



Mr. Sahil Agey

VISION

Developing technocrats in Mechanical Engineering with computational and design skills, leadership and industrial practices, meeting the requirements of industry / business and society, through Quality Technical Education.

MISSION

M1 - Developing Quality Mechanical Engineering graduates by imparting theoretical and practical knowledge with the exposure to work practices in Industry and Business.

M2 - Develop graduates with over all personality, communication skills, computational skills and managerial skills with ethics to fulfill the expectations of the Industry and Society.

M3 - Provide opportunities to practice industrial processes, pursue higher studies and entrepreneurship skills for sustainable growth.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

Graduates of Mechanical Engineering shall

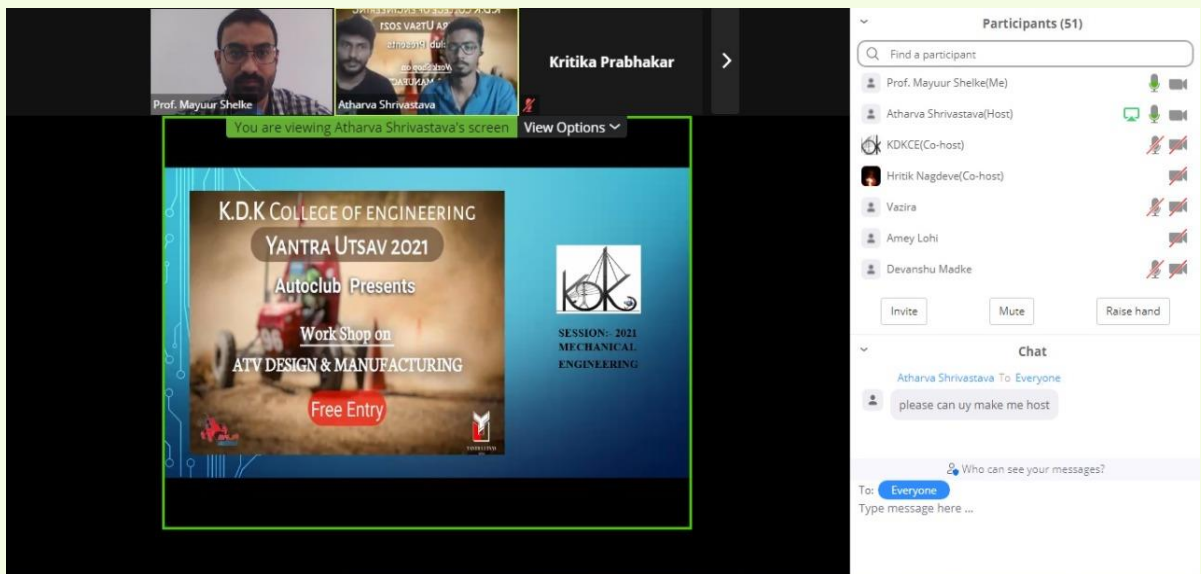
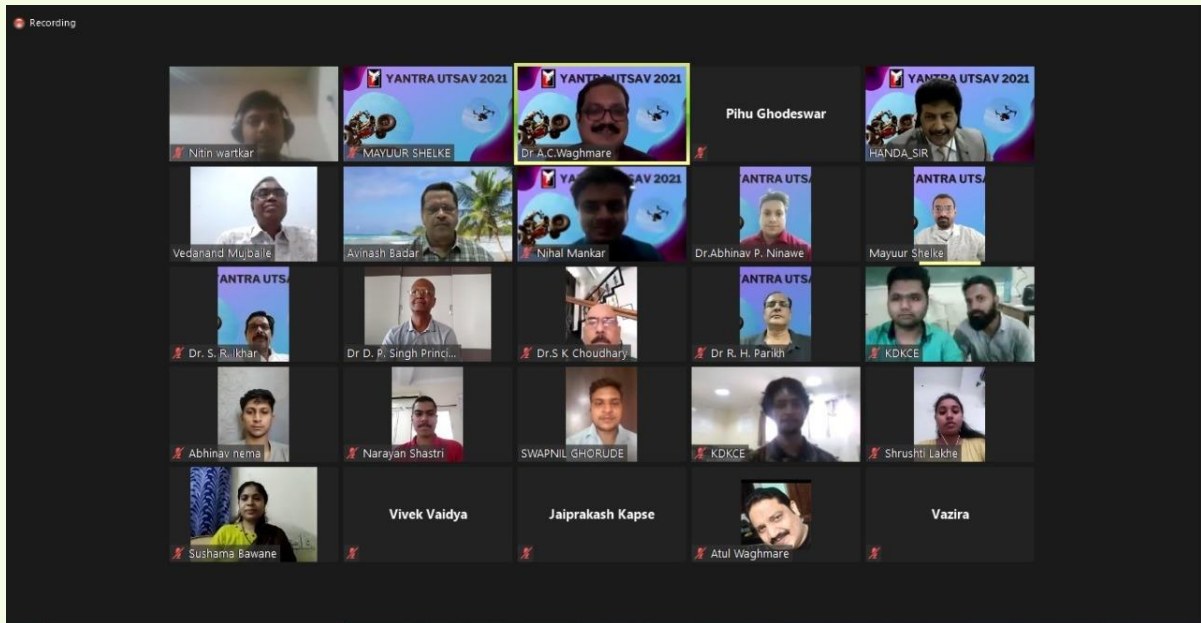
- **PEO1** - Have good technical competency to take up industrial projects / responsibilities as per the national / International requirements for enriched employability.
- **PEO2** - Design and develop innovative products / systems through application of mechanical and allied engineering knowledge, computing skills to promote research and higher studies.
- **PEO3** - Work successfully as leaders or as part of the team on multidisciplinary projects and undertake consultancy and entrepreneurship as their career option.

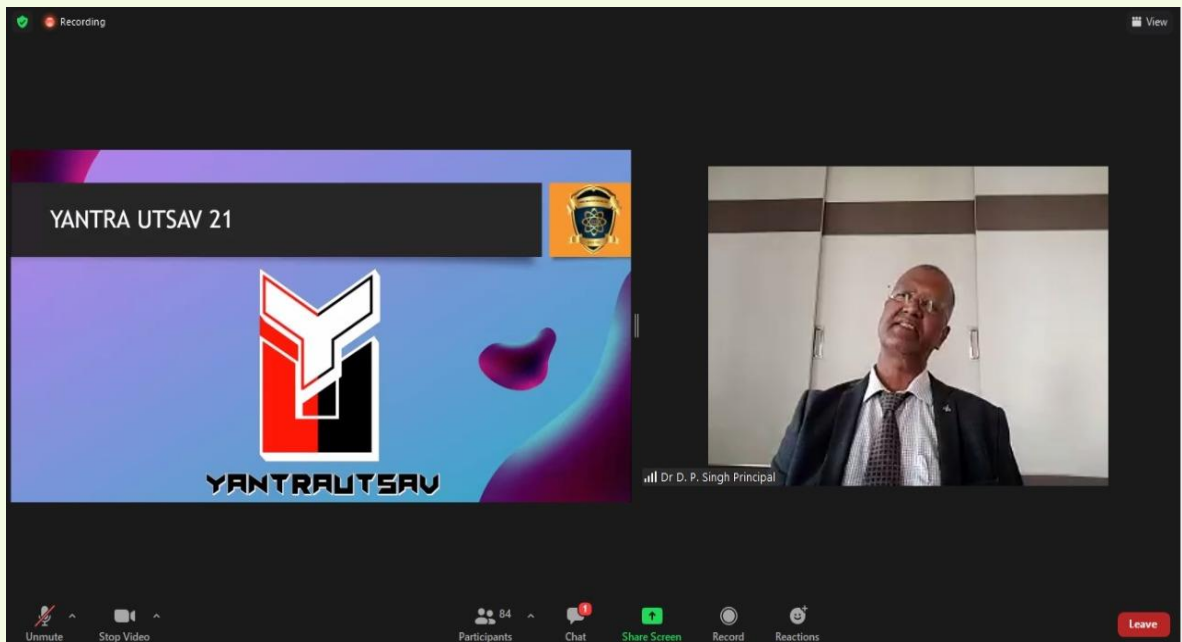
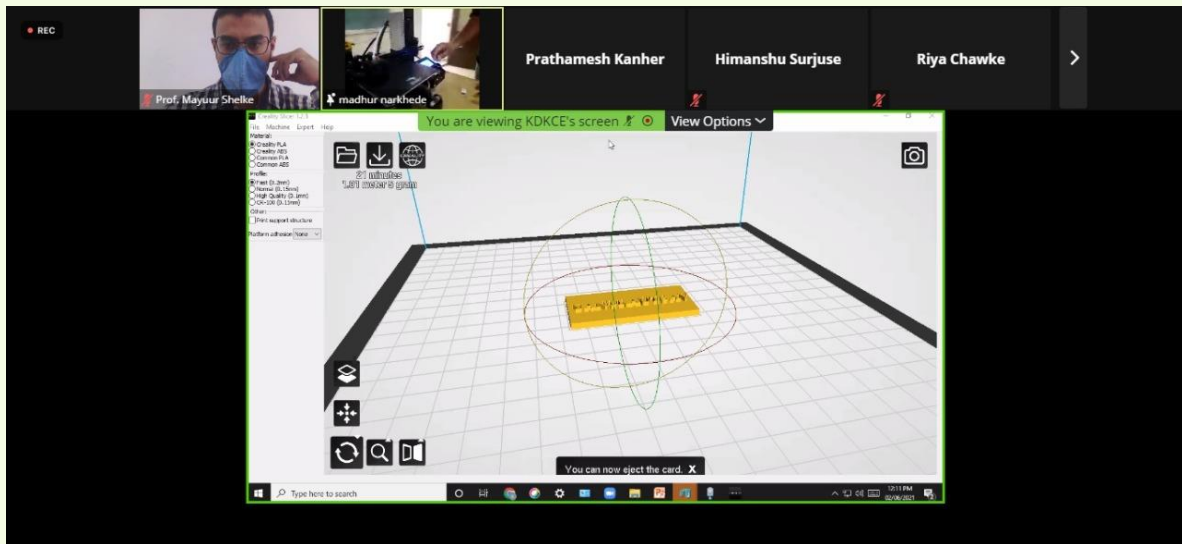
PROGRAM SPECIFIC OUTCOMES (PSOS)

- **PSO1** - Acquire and apply knowledge in various domains like Design, Thermal, Production and allied areas through theory / practical / industrial visits.
- **PSO2** - Acquired Engineering knowledge, Computational, Management, Software skills and Entrepreneurship skills for the betterment of Industrial and Social requirement.

NEWS-LETTER MECHANICAL DEPPT. - 2020-21

1. **"YANTRAUTSAV-2021"** a National level technical event organized by Club-Robo and Club Auto, Mechanical Engineering Department. This event comprise of skill development workshop on 3-D printing and ATV Design also the different events like Think unique Idea presentation, Model presentation and Code Mania was held during these two days. Around 250 plus participants were registered and attended from different regions of country in this event.
DATE - 02-03/06/2021.

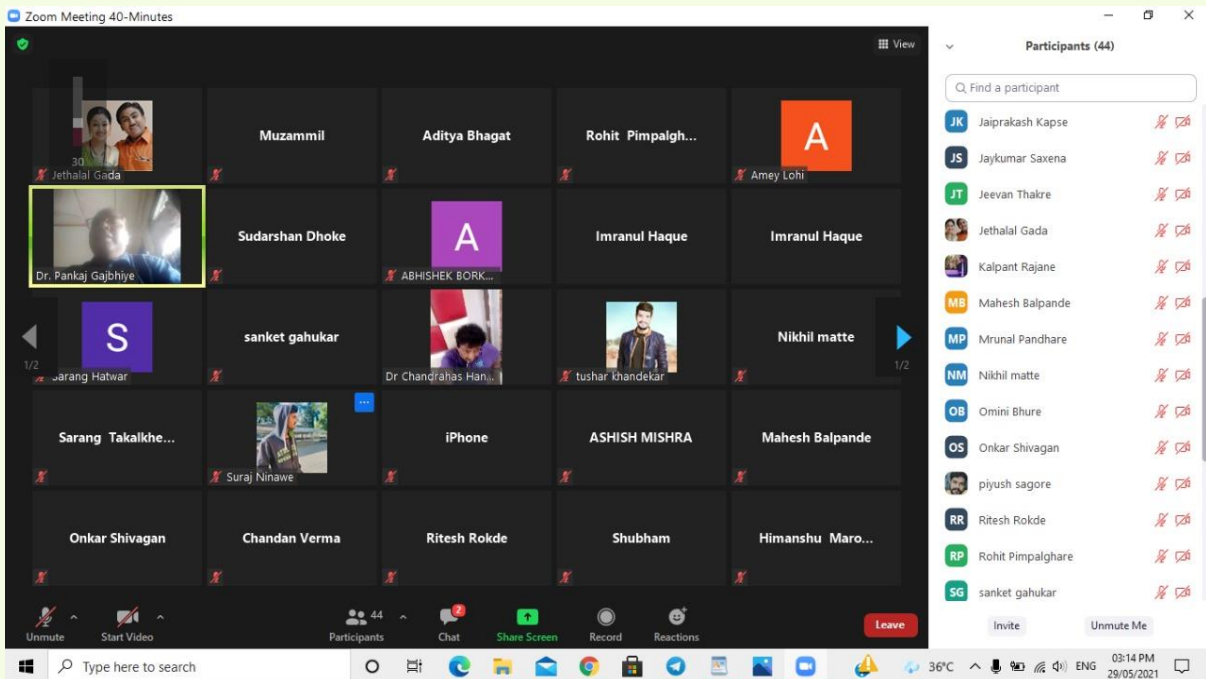
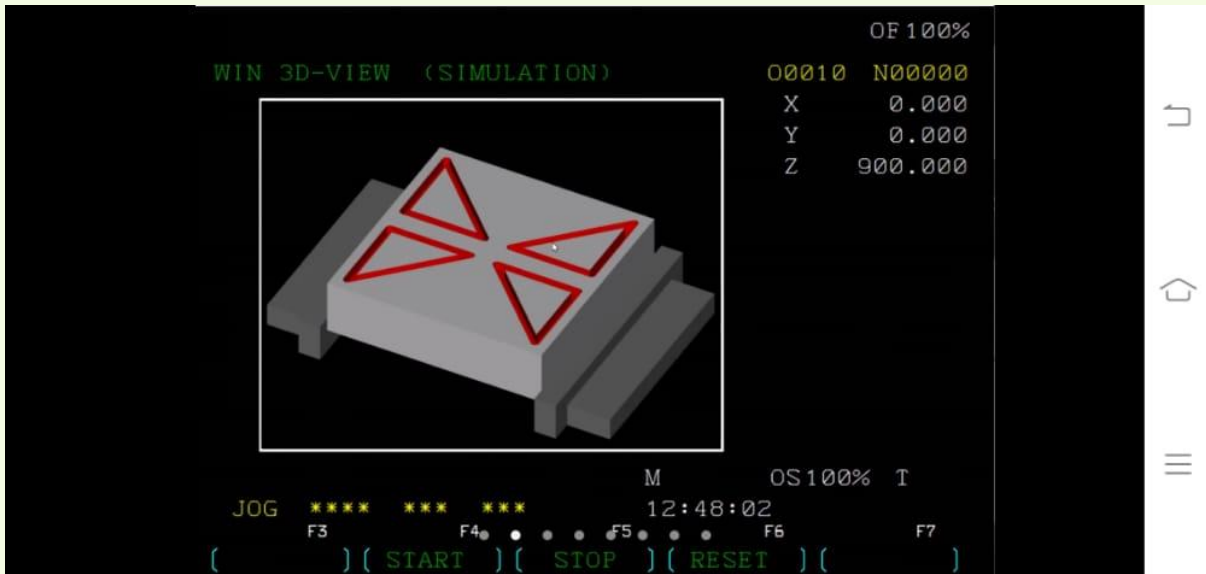




2. IGTR Skill Development Workshop

This year M.E.S.A. in association with IGTR Aurangabad organized a skill development program on CNC programming on milling. This helps the students to develop their skills corresponding with the upcoming technologies. CNC programming software creates program codes and instructions used to run a machine tool controlled by a computer. CNC stands for Computer Numerical Control. The program was inaugurated by Dr. C.C.Handa and Prof. Pankaj Gajbhiye along with the IGTR resource person Mr. Imran Haque. The workshop was a very successful event as around 52 students from various colleges took part.

DATE- 29/5/2021



3. "PPT MAKING EVENT" organized by dept. of Mechanical engineering

This event was organized by Mechanical engineering department for the budding engineers around 50 plus student sent their ppts with the registration out of which five best ppts were selected by the faculties and the selected students presented their ppts on the said date.

DATE-11/06/2021)



4. ZHEP-2021

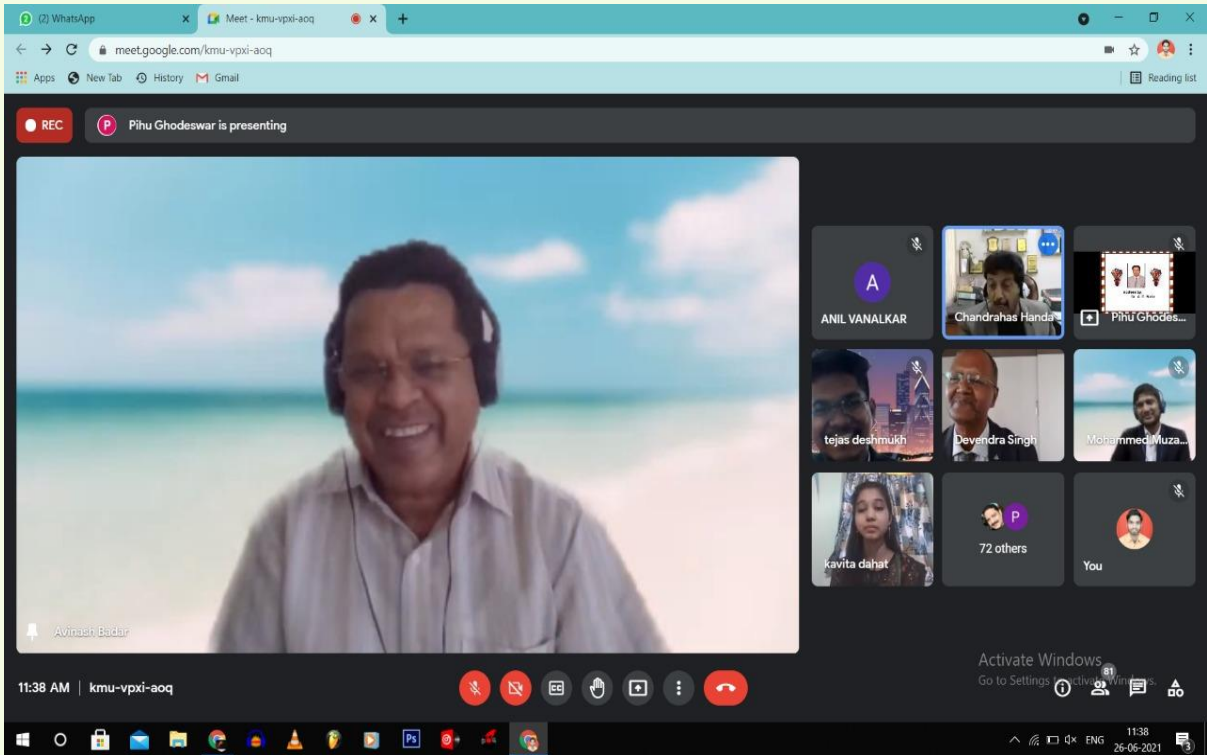
Like every year, MESA organises its signature event called ZHEP-XXI on 26th JUNE 2021. Inauguration of this event was done by Honourable Principal of KDKCE Dr.D.P.Singh, Vice Principal Dr.A.M. Badar, Head of Mechanical Dept.Dr.C.C.Handa along with all the teaching staff and Guest of Honour Mr.Gagandeep Singh (Alumini,Mechanical),Toronto,Canada.



The event was organised & managed by MESA Team of President TejasDeshmukh, Vice President Pranay Chapple, Secretary Pranav Kumar, along with all other MESA members in the presence of MESA InchargeDr. P.R. Gajbhiye.






Many competitions were organised on online platform such as MOCK SSB, Technical Report Seminar, CAD Competition, Among Us(game) and National Level singing competition, KARAOKE judged by 'Nagpur Mahagayak 2010' & 'Vidharba Best Singer Teacher 2020' Dr. P.R.Gajbhiye along with Miss Swasthika Thakur, Rising Star Fame &Vidharbha Idol. The main objective of this event was to increase the technical and extracurricular talent of the students.

This event was the huge success for the entire MESA team. The outcome comes as so many students from corners of the nation took participation in event. Specially KARAOKE was the apple of an eye of the whole event. Each and every MESA member shows proper teamwork and puts their efforts to execute this beautiful event without any setback.



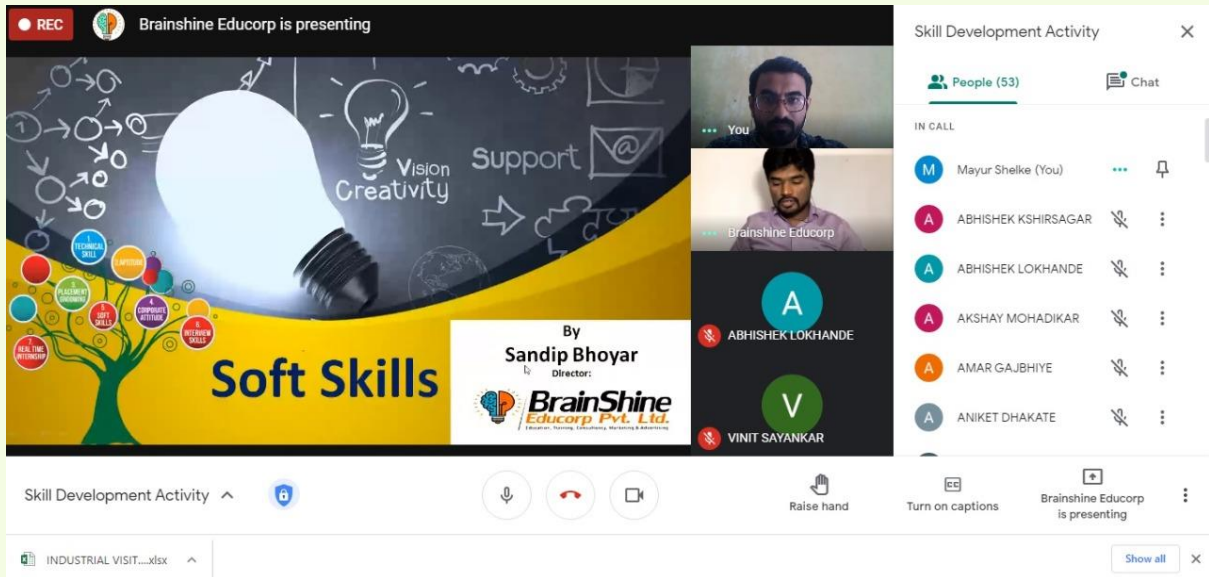


 **KDK COLLEGE OF ENGINEERING** 
MECHANICAL ENGINEERING STUDENT ASSOCIATION (MESA)
Organizes
ZHEP XXI

MOCK SSB  Sandesh Rajurkar-7057135206 Samruddha Lutade-7387046584 Prachi Gajbhiye-8999371920	TECHNICAL PRESENTATION(PPT)  S.Ajay Raj-8358858006 Himanshu Lanjewar-7620627178 Sagar Kumbhare-8552062770	
CAD COMPETITION  Vinayak Pal- 8530850966 Mansi Balki- 8698360678 Tejas Kadak- 7249549095	KARAOKE (NATIONAL LEVEL)  Mohd.Muzammil-9179793507 Pihu Ghodeswar-9307948856	AMONG US  Prathmesh Jaiswal-8788134988 Tushar Lokhande-8959121880 Tejas Arikar-9604670623

5. A webinar on "**Soft Skill for Carrier Growth**" Conducted by. This seminar was organised by Competitive Exam Guidance Center KDKCE, nagpur in association with Brain Shine Educorp, Nagpur

Speaker- Mr. Sandip Bhoyar sir, BrainShine Educorp, Nagpur
DATE-03/02/2021



LIVE WEBINAR



KDK College Of Engineering, Nagpur
 Accredited by NAAC and NBA
 Competitive Exam Guidance Centre
 &
 Mechanical Engg. Department
 In Association with
Brainshine Educorp, Nagpur

Time Management

Interview Skills

Soft Skills

Professionalism

Communication

Leadership

Presentation

Speaker:
Mr. Sandip Bhoyar
 Director - Brainshine Educorp

Dr. C. C. Handa
HOD, Mechanical Dept

Dr. A. M. Badar
Vice - Principal

Dr. D. P. Singh
Principal

Register Now

Prof. M. S. Shelke
Faculty Coordinator
In-Charge - CEGC

For Any Queries Contact Us @
 9028228006
 9923106220

Technical Magazine

Department of Mechanical Engineering

Technical Editor



Dr. P. R. Gajbhiye

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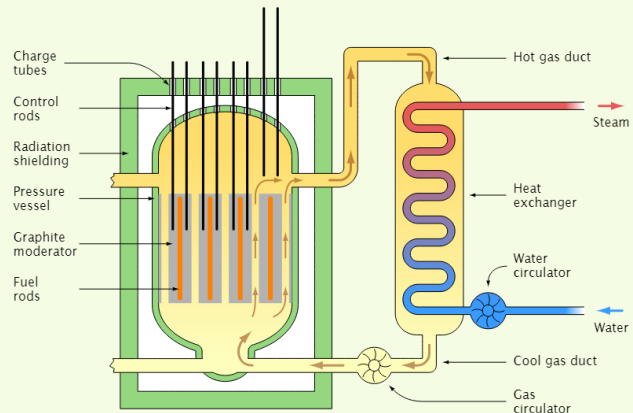
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Nuclear Reactor



Dr. P. R. Gajbhiye

**Faculty of Mechanical Engineering
Department**



Nuclear reactors, any of a class of devices that can initiate and control a self-sustaining series of nuclear fissions. nuclear reactors are used as research tools, as systems for producing radioactive isotopes, and most prominently as energy sources for nuclear power plants.

Principles of operation

Nuclear reactors operate on the principle of nuclear fission, the process in which a heavy atomic nucleus splits into two smaller fragments. The nuclear fragments are in very excited states and emit neutrons, other subatomic particles, and photons. The emitted neutrons may then cause new fissions, which in turn yield more neutrons, and so forth. Such a continuous self-sustaining series of fissions constitutes a fission chain reaction. A large amount of energy is released in this process, and this energy is the basis of nuclear power systems.

The main components of a nuclear reactor are listed below.

- **The Core:** It contains all the fuel and generates the heat required for energy production.
- **The Coolant:** It passes through the core, absorbing the heat and transferring into turbines.
- **The Turbine:** Transfers energy into the mechanical form.
- **The Cooling Tower:** It eliminates the excess heat that is not converted or transferred.
- **Neutron Moderator:** Moderators are used for reducing the speed of fast neutrons released from the fission reaction and making them capable of sustaining a nuclear chain reaction.

- Usually, water, solid graphite, and heavy water are used as a moderator in nuclear reactors.
- Commonly-used moderators include regular (light) water (in 74.8% of the world's reactors), solid graphite (20% of reactors), heavy water (5% of reactors).
- **The Containment:** The enveloping structure that separates the nuclear reactor from the surrounding environment.
- **Neutron Poison:** A neutron poison (also called a neutron absorber or a nuclear poison) is a substance with a large neutron absorption cross-section.

Internet of Things (IoT)



Miss. Pihu L. Ghodeswar
3rd Year



Internet of Things (IoT) is a new paradigm that has changed the traditional way of living into a high tech life style. Smart city, smart homes, pollution control, energy saving, smart transportation, smart industries are such transformations due to IoT. A lot of crucial research studies and investigations have been done in order to enhance the technology through IoT. However, there are still a lot of challenges and issues that need to be addressed to achieve the full potential of IoT. These challenges and issues must be considered from various aspects of IoT such as applications, challenges, enabling technologies, social and environmental impacts etc.

The main goal of this review article is to provide a detailed discussion from both technological and social perspective.

The article discusses different challenges and key issues of IoT, architecture and important application domains. Also, the article bring into light the existing literature and illustrated their contribution in different aspects of IoT.

Artificial Intelligence and Machine Learning



Mr. Samruddha Lutade
3rd Year



Artificial Intelligence (AI) and particularly Machine Learning (ML) techniques have been playing an ever-increasing role in processing large data sets and producing insight and technological applications. In the last decade, *Giga Science* has focused on publishing the outputs and methods from “big-data” biological and biomedical research. With our Open Science expertise, ability to host all data and computational tools in our Giga DB repository, and our ‘Reproducibility Toolkit’ for reviewing, we are able to publish AI and ML papers in an interactive and reproducible manner. Given the interest and growth in this area, we highlight some of our most recent AI articles below.

Among these articles is a presentation of extremely useful clinical datasets for training AI, as well as research on AI models to assist with clinical diagnoses. Currently, we are seeking additional AI and ML submissions that will be specially highlighted here.

Additive Manufacturing



Mr. Kashinath G. Meshram
3rd Year

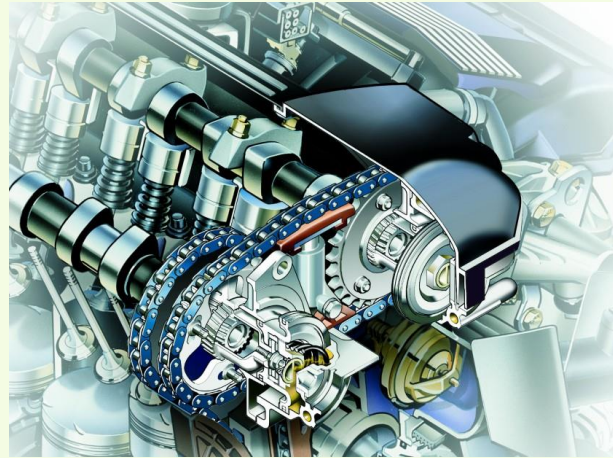


Additive manufacturing is a recent trend in production processes owing to its many benefits. It can be defined as the process of producing parts through the deposition of material in a layer-by-layer fashion. It has been a topic of intense study and review by many researchers. In this work, a comprehensive review pertaining to additive manufacturing has been accomplished. The evolution of additive manufacturing as a prominent technology and its various phases are discussed. The importance of part orientation, build time estimation, and cost computation has also been reviewed. The remarkable aspect of this work is the identification of problems associated with different additive manufacturing methods. Because of the imperfections in additive manufacturing, its hybridization with other methods, such as subtractive manufacturing, has been emphasized.

Variable Valve Timing (VVT)



Miss. Mansi R. Balki
3rd Year



In internal combustion engines, **variable valve timing (VVT)** is the process of altering the timing of a valve lift event, and is often used to improve performance, fuel economy or emissions. It is increasingly being used in combination with variable valve lift systems. There are many ways in which this can be achieved, ranging from mechanical devices to electro-hydraulic and camless systems. Increasingly strict emissions regulations are causing many automotive manufacturers to use VVT systems. Without variable valve timing, the duration, timing and lift of the valve will be the same for all engine conditions. The factors like valve opening timing and duration have a great effect on the veralliciency of the engine. For an engine which runs a wide range of speed like a racing car, the single valve timing profile is not justifiable. The VVT system frees the engine from this constraint. There are many ways to achieve VVT, ranging from mechanical, electro-hydraulic devices and camless systems. The common methods for implementing Variable Valve Control is listed below

- Cam switching - Use more than one cam profile, an actuator (at a specific engine speed) is used to swap between these profiles.
- Cam phasing - Also known as variator. It gives continuous VVT but has no effect on duration valve timing.

- Oscillating cam - It can continuously adjust both phase and duration. But cannot adjust the duration of valve operation separately.
- Eccentric cam drive - Which operates through an eccentric disc mechanism. The eccentric cam drive system can vary the duration independent of lift(cam switching).
- Camless engines - This engine does not rely on the cams for the valve operation. So It has great flexibility having variable valve timing. However, there is no camless engine released for road vehicles.
- Helical camshaft
- Three-dimensional cam lobe
- Two shaft combined cam lobe profile
- Coaxial two shaft combined cam lobe profile

Biosensors : Use in Agriculture



Mr. Rajat Patil
3rd Year



A biosensor is an analytical device that converts a biological reaction into electrical signals, contains detecting elements like a sensor system and a transducer. It includes checking ecological pollution control, in the agriculture field as well as food industries. The main features of biosensors are stability, cost, sensitivity, and reproducibility. It contains three segments viz, sensor, transducer, and electrons. A specific enzyme or preferred biological material is deactivated by some of the usual methods, and the deactivated biological material is in near contact with the transducer. The analyte connects to the biological object to shape a clear analyte which in turn gives the electronic reaction that can be calculated. The electrical signal of the transducer is frequently low and overlays upon a fairly high baseline. Generally, the signal processing includes deducting a position baseline signal, obtained from a related transducer without any biocatalyst covering.

- I. Aim to develop the quality of life.
- II. Covers their use for environmental monitoring, disease recognition, food security, defense, drug discovery, and many more.
- III. Biosensors can be used as platforms for monitoring food, traceability, quality, safety, and nutritional value.