A Association of RMS Students

INGENIUM

Volume 3, Issue 4, April – June, 2022

Department Newsletter

Department of Mechanical Engineering

A. J. Institute of Engineering and Technology

(A unit of Laxmi Memorial Education Trust ®)

NH-66, Kottara Chowki, Mangaluru – 575006

AJIET

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DEPARTMENT NEWSLETTER

Message from Editor's Desk:

Welcome to the third volume, fourth issue of Newsletter from the Department of Mechanical Engineering. This newsletter is a digital way for us to communicate with our students, faculty members, alumni and industrial partners. It aims to showcase the glimpse of the departmental activities and achievements. It enlightens the readers about the latest happenings in the department, focusing about different activities like placement, industry-academia, club activities, student and faculty achievements.

HOD's Message

Welcome to the fourth issue of the Mechanical Engineering Department Newsletter - 'IGENIUM' in its volume 3 series. It is about looking back and summing up every prestigious moment in the department. This newsletter is a bridge for us to communicate with our students, faculty members, alumni and industrial partners. It aims to showcase their achievements by which make them proud and self-motivated. We take the readers for a voyage of the latest incidence and happenings in the department. Any feedback will be greatly appreciated for the improvement of the next issue of the Newsletter.

Dr. Rajesh Rai P
Head, Department of Mechanical Engineering
A. J. Institute of Engineering and Technology

VISION

To create globally competent and self-reliant mechanical engineers adaptive to an interdisciplinary environment contributing to society through development, authority and entrepreneurship.

MISSION

- To offer high-quality graduate programme in the fields of Mechanical Engineering with value education to the students and make them responsive to societal needs.
- To nurture the students with a global outlook for a sustainable future with high moral and ethical values.
- To strengthen collaboration with industries academia and research organizations to enrich learning environment, thus enhance research and entrepreneurship culture.
- To create awareness about the need of interdisciplinary applications through alumni industry-institution interactions.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Prepare graduates with mathematical, scientific and engineering skills to design and develop energy efficient systems for sustainable development.

PEO2: Excel graduates with high level of technical competency combined with research and complex problem solving ability to generate innovative solutions in Mechanical and multi-disciplinary areas.

PEO3: Equip students with modern tools, technology and advanced software's for deliberating engineering solutions.

PEO4: Inculcate graduates with strong foundation in academic excellence, soft skills, leadership qualities, professional ethics, and social concerns and understand the need for lifelong learning for a successful professional career

PROGRAM OUTCOMES (POs)

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Apply the knowledge of modern engineering tools to design and Analyse the products and processes related to mechanical engineering system.

PSO2: Develop technical and interpersonal skills pertinent to mechanical and allied engineering for careers in industry, academia and government organisations.

RESEARCH

Domain Name	Domain Co-coordinator	Domain Members
MANUFACTURING	Dr. Rajesh Rai P	Mr. Prashanth D A, Mr. Nithin Shet, Mr. Prasad B G
THERMAL	Dr. Vighnesha Nayak	Dr. Sreejith B K, Mr. Prakhyath, Mr. Karthik A V
DESIGN	Mr. Sunil Kumar S	Mr. Sudheer Kini, Mr. Harold J D'Souza

MINI-PROJECT

SL NO	TITLE	GUIDE	STUDENTS NAME	
1	EFFECT OF POROSITY ON AIRFOIL	Dr. Sreejith B K	SARANG CM	4JK18ME032
			PRANAV TV	4JK18ME028
			PRANAV AP	4JK18ME027
			ABHISHEK S	4JK18ME049
2	AGRIBOT	Mr. Prakhyath	SHRAVAN K	4JK19ME405
			MANISH K ANCHAN	4JK19ME402
			MOHAMMEDFAYAZ	4JK19ME404
			MANISH M P	4JK19ME403
3	ROBOSOCCER	Mr. Prakhyath	ASHISH H	4JK18ME009
			HARSHITH SHETTY	4JK18ME018
			DHEERAJ RAO	4JK18ME016
			DEEKSHITH	4JK18ME013
4	AIR ENGINE	Mr. Karthik A.V.	ADITH AJITH KUMAR	4JK18ME003
			DEEPA A S	4JK18ME014
			DHARMIK ATTAVAR	4JK18ME015
			RAKSHITH ACHARYA	4JK18ME051

STUDENT PROJECTS

Sl. No	Batch	USN	Students Name	Guide	Project Title
1	B1	4JK18ME044	VIGHNESH R PAI	Dr. Vighnesha Nayak	Electricity generation from Hydrodynamic behaviour of floating substances in directional seas
2		4JK18ME014	DEEPA A S		
3		4JK18ME018	HARSHITH SHETTY		
4		4JK19ME402	MANISH K ANCHAN (TL)		
5	B2	4JK19ME405	SHRAVAN K	Mr. Prakhyath	Experimental and computational analysis of co-centric tube heat exchanger with pin-fin
6		4JK18ME026	PAVAN KUMAR (TL)		
7		4JK18ME036	SHARAN CHANDRAHAS		
8		4JK18ME038	SHRAVAN P C		
9	B3	4JK18ME050	VASANTHKUMAR T S	Mr. Sunil Kumar S	A novel plastic waste management system to control Air-pollution
10		4JK18ME047	YOJITH K (TL)		
11		4JK18ME051	RAKSHITH ACHARYA		
12		4JK18ME039	SHRAVANRAJ KAMBALI		

13	B4	4JK18ME028	PRANAV T V	Dr. Sreejith	Fire extinguisher using sound waves
14		4JK18ME032	SARANG C M (TL)		
15		4JK18ME049	ABHISHEK SASIDHARAN		
16		4JK18ME027	PRANAV A P		
17	B5	4JK18ME003	ADITH AJITH KUMAR	Mr. Harold J D'Souza	Mechanical response of elastomers subjected to degrading environment
18		4JK18ME015	DHARMIK ATTAVAR		
19		4JK18ME040	SHRUJAN J RAI (TL)		
20		4JK19ME403	MANISH M P		
21	B6	4JK18ME048	SHREEJESH K	Mr. Sudheer Kini K	Development of disinfection robot using UV light and sanitisation
22		4JK18ME052	VISHNU V NAIR (TL)		
23		4JK18ME041	SRAVAN CHANDRASEKHARAN		
24		4JK18ME043	VENKITESH RAGHAV R		
25	B7	4JK18ME021	LESTON LOBO	Mr. Prakhyath	Multi-purpose inspection robot
26		4JK18ME009	ASHISH H		
27		4JK18ME045	VIGNESH (TL)		
28		4JK18ME013	DEEKSHITH		
29	B8	4JK17ME028	KAVAN K	Mr. Nithin Shet	Design and fabrication of AeroLeaf wind turbine
30		4JK18ME029	PRATHEEK B V		
31		4JK18ME031	ROSHAN DSOUZA (TL)		
32		4JK18ME016	DHEERAJ		
33	B9	4JK19ME404	MOHAMMED FAYAZ	Mr. Karthik A V	Design and development of Remote controlled coconut tree digging and fertilizer pouring machine
34		4JK19ME406	VISHWAJEETH ARUN NAIR		
35		4JK19ME401	JAYAPRAKASH B N		
36		4JK18ME020	KAPOOR SAHIL (TL)		
37	B10	4JK17ME011	ASHIN (TL)	Mr. Prasad B G	Road sign recognition and speed variation system
38		4JK17ME023	ISMAIL EBRAHIM		
39		4JK17ME017	EMIL WILLIAM MAVEETTIL		
40		4JK17ME034	MOHAMMED ABSHAR		
41		4JK17ME013	BASIL T BABY		
42	B11	4JK18ME007	AKHILRAJ E S (TL)	Mr. Prashanth D A	production of fuel from waste plastic material through injection moulding process
43		4JK18ME002	ABRAHAM MATHEW		

44		4JK18ME006	AKHIL K S		
45		4JK18ME053	ANIRUDH K		
46	B12	4JK18ME030	RITVIK P SHETTY	Dr. Rajesh Rai P	Automated wheelchair cum Stretcher
47		4JK18ME033	SARVESH S		
48		4JK18ME019	HARSHITH V SHETTY		
49		4JK18ME035	SHANTHANU SUDHAS		
50	B13	4JK18ME004	AJAYRAJ M J (TL)	Mr. Sunil Kumar S	Smart drilling machine
51		4JK17ME067	MOHAMMAD SANEEN		
52		4JK18ME034	SAURAV C PADMASHALI		
53		4JK18ME042	VAISHNAV BALIGA (TL)		

INTERNSHIPS

Sl No.	USN	Name	Organization
1	4JK17ME028	Kavan	Shakti Tools
2	4JK17ME067	Mohammed Saneen	AJIET, Mangalore
3	4JK18ME002	Abraham Mathew	Southern Railways, Mangalore
4	4JK18ME003	Adith Ajith Kumar	Mangalore Pipes,Mangalore
5	4JK18ME004	Ajayraj M J	Southern Railways , Mangalore
6	4jJK8ME006	Akhil Ks	Southern Railways , Mangalore
7	4JK18ME007	Akhilraj E S	Western Indian Plywood Ltd
8	4JK18ME009	Ashish H	Ashutosh Engineering
9	4JK18ME013	Deekshith	Ashutosh Engineering
10	4JK18ME014	Deepa A S	Ashutosh Engineering

11	4JK18ME015	Dharmik Attavar	Government Tool Room And Training Centre
12	4JK18ME017	Dheeraj	Government Tool Room And Training Centre
13	4JK18ME018	Harshith Shetty	Ashutosh Engineering
14	4JK18ME019	Harshith V Shetty	Government Tool Room And Training Centre
15	4JK18ME020	Sahil Kapoor	Western Coal Field Ltd
16	4JK18ME021	Leston Lobo	Ashutosh Engineering
17	4JK18ME026	Pavan Kumar	Government Tool Room And Training Centre
18	4JK18ME027	Pranav. A. P	Southern Railways , Mangalore
19	4JK18ME028	Pranav T V	Western Indian Plywood Ltd
20	4JK18ME029	Pratheek B V	Mangalure Pipes
21	4JK18ME030	Ritvik P Shetty	Government Tool Room And Training Centre
22	4JK18ME031	Roshan Dsouza	Shakti Tools
23	4JK18ME032	Sarang Cm	Western Indian Plywood Ltd
24	4JK18ME033	Sarvesh Sujan	Government Tool Room And Training Centre
25	4JK18ME034	Saurav C Padmashali	Basf India.Ltd
26	4JK18ME035	Shanthanu	Toyota Kirloskar Motors Pvt Ltd
27	4JK18ME036	Sharan Chandrahas	Government Tool Room And Training Centre
28	4JK18ME038	Shravan Pc	Toyota Kirloskar Motors Pvt Ltd
29	4JK18ME039	Shravanraj Kambali	Mangalore Pipes,Mangalore
30	4JK18ME040	Shrujan J Rai	Mangalore Pipes

31	4JK18ME041	Sravan Chandrasekharn	Western Indian Plywood Ltd
32	4JK18ME042	Vaishnav Baliga	Government Tool Room And Training Centre
33	4JK18ME043	Venkitesh Raghav R	Southern Railways , Mangalore
34	4JK18ME044	Vighnesh R Pai	Ashutosh Engineering
35	4JK18ME045	Vignesh	Mangalore Pipes
36	4JK18ME047	Yojith K	Virtual Labs (Nitk Surathkal)
37	4JK18ME048	Shreejesh K	Southern Railways , Mangalore
38	4JK18ME049	Abhishek Sasidharan	Western Indian Plywood Ltd
39	4JK18ME050	Vasanth Kumar T S	Southern Railways , Mangalore
40	4JK18ME051	Rakshith Acharya	Government Tool Room And Training Centre
41	4JK18ME052	Vishnu V Nair	Southern Railways , Mangalore
42	4JK18ME053	Anirudth K	Western Indian Plywood Ltd
43	4JK19ME401	Jayaprakash B N	Southern Railways , Mangalore
44	4JK19ME402	Manish K Anchan	Ashutosh Engineering
45	4JK19ME403	Manish M P	Government Tool Room And Training Center
46	4JK19ME404	Mohammed Fayaz	Government Tool Room And Training Center
47	4JK19ME405	Shravan K	Government Tool Room And Training Centre
48	4JK19ME406	Vishwajeet Arun Naik	Southern Railways , Mangalore
49	4JK17ME017	Emil William	Prinston Smart Engineering, Bangalore
50	4JK17ME023	Ismail Ebrahim	Prinston Smart Engineering Bangalore

51	4JK17ME011	Ashin.M.K	Prinston Smart Engineering Bangalore
52	4JK17ME034	Abshar	Prinston Smart Engineering Bangalore
53	4JK17ME013	Basil T Baby	Prinston Smart Engineering Bangalore

National/International Conferences

V. Nayak, A.V. Karthik, B.K. Sreejith, B.G. Prasad, & K. Sudheer Kini, **"Performance, combustion and emission characteristics of single cylinder CI engine with WCO biodiesel and nanoparticles",** Materials Today: Proceedings, Volume 52, Part 3, 2022, Pages 1570-575, ISSN 2214-7853, https://doi.org/10.1016/j.matpr.2021.11.249.

FDP/WEBINAR/SEMINARS/TRAINING

SREEJITH B. K. of AJIET has participated in one-week GIAN program on organized by the Department of Mechanical Engineering, B. M. S. College of Engineering, Bengaluru, from 20th to 4th June 2022.

OTHER DEPARTMENT RELATED TASK

Dr. Vighnesha Nayak guided one final year project entitled "Electricity Generation from Hydrodynamic Behavior of Floating Substances in Directional Seas" and fabrication work was completed.
Mr. Prasad B G has guided one project entitled "ROAD SIGN RECOGNITION AND SPEED VARIATION SYSTEM" and the prototype of the same has been fabricated
Mr. Prasad B G has conducted the event "REEL IT" held during the fourth intercollegiate Techno-cultural fest "AJIET AAKAR-2022"on June 3rd, 2022 at AJIET campus.

Mr. Prasad B G has been the judge for the event "ARTISTICA" held during the fourth intercollegiate Techno-cultural fest "AJIET AAKAR-2022"on June 3rd, 2022 at AJIET campus.
Mr. Prasad B G has been the judge for the event "SCRAMBLED COLLAGE" held during the fourth intercollegiate Techno-cultural fest "AJIET AAKAR-2022"on June 4th, 2022 at AJIET campus.
Mr. Prashantha D A has conducted the event "MASTER CAD" held during the fourth intercollegiate Techno-cultural fest "AJIET AAKAR-2022"on June 4th, 2022 at AJIET campus.
Dr. Vighnesha Nayak has conducted the event "PAPYRUS" Technical paper presentation held during the fourth intercollegiate Techno-cultural fest "AJIET AAKAR-2022"on June 3rd, 2022 at AJIET campus.
Dr. Vighnesha Nayak guiding one mini-project entitled as "AUTOMATIC FOG MAKING MACHINE".
Dr. Sreejith B K guided one final year project entitled "DEVELOPMENT OF 360° ROTATING SOUNDWAVE FIRE EXTINGUISHER" and fabrication work was completed.
Dr. Sreejith B K has worked as stage committee member during the fourth intercollegiate Techno-cultural fest "AJIET AAKAR-2022"on June 3rd, 2022 at AJIET campus.
Mr. Prakhyath has conducted the event "TRIAL OF TRIVIA " held during the fourth intercollegiate Techno-cultural fest "AJIET AAKAR-2022"on June 4th , 2022 at AJIET campus.
Mr. Prakhyath has guided project entitled "Computational and Experimental analysis of concentric flow counter flow pin fin based heat exchanger and the prototype of the same has been fabricated.
Mr. Prakhyath has guided project entitled "Multi-Purpose Robot and the prototype of the same has been fabricated.
Mr. Prakhyath has been the judge for the event "ARTISTICA" held during the fourth intercollegiate Techno-cultural fest "AJIET AAKAR-2022"on June 4th, 2022 at AJIET campus.
Mr. Prakhyath has been the judge for the event "RANGOLI" held during the fourth intercollegiate Techno-cultural fest "AJIET AAKAR-2022"on June 4th, 2022 at AJIET campus.
AICET grade point activity presentation conducted for 8th semester students under Dr. Sreejith B K's supervision 22 - 28 June 2022.
Mr. Sudheer Kini K has conducted the event "DIAMOND RUSH" held during the fourth intercollegiate Techno-cultural fest "AJIET AAKAR-2022"on June 4th, 2022 at AJIET campus.

Mr. Sudheer Kini K has worked as a discipline committee member during the 2nd Graduation day on April 30th, 2022 at AJIET campus.
Mr. Sudheer Kini K has guided project entitled "DEVELOPMENT OF DISINFECTION ROBOT USING UV LIGHT AND SANITIZER" and the prototype of the same has been fabricated.
Mr. Harold D'Souza has conducted the event "ROBO SOCCER" held during the fourth intercollegiate Techno-cultural fest "AJIET AAKAR-2022"on June 3rd, 2022 at AJIET campus.
Mr. Harold D'Souza guided one final year project entitled "MECHANICAL RESPONSE OF ELASTOMERS SUBJECTED TO DEGRADING ENVIRONMENT", testing to be done.

STUDENT ACHIEVEMENTS

ACADEMIC TOPPERS

Adith Ajith Kumar, Scored 9.25 SGPA in 7th Semester university exam

Harshith Shetty, Scored 9.10 SGPA in 7th Semester university exam

Deepa A. S, Scored 9.10 SGPA in 7th Semester university exam

Vighnesh R. Pai, Scored 8.85 SGPA in 7th Semester university exam

Dhanush M. S, Scored 8.80 SGPA in 5th Semester university exam

Akhila V. P, Scored 8.48 SGPA in 5th Semester university exam

Vikas R. Shetty, Scored 8.40 SGPA in 5th Semester university exam

Salian Vikith Vishwanath, Scored 8.29 SGPA in 3rd Semester university

U Sagar, Scored 7.75 SGPA in 3rd Semester university exam

TECHNICAL EVENTS

Mr. SARANG C M, Mr. ABHISHEK SASIDHARAN, Mr. PRANAV A.P, Mr. PRANAV T.V of 8th semester, participated in Student Project Programme - 45th Series, KSCST Karnataka Final presentation on 24-06-2022 at VTU, Belagavi.

FUNDS AND GRANTS

Sl No.	Ref. No.	Title of Project	Guide	Students Name	Amount (Rs.)
1	45S_BE_1684	**A Novel Plastic Waste Management System To Control Pollution.**	**Dr. Sunil Kumar S**	Mr. Vasanth Kumar T S Mr. Rakshith Acharya Mr. Yojith K Mr. Shravanrak Kambli	**7,000/-**
2	45S_BE_2110	**Development Of 360° Rotating Soundwave Fire Extinguisher**	**Dr. Sreejith B. K**	Mr. Sarang C M Mr. Abhishek Sasidharan Mr. Pranav A.P Mr. Pranav T.V	**7,500/-**
3	45S_BE_2333	**Injection Moulding Machine And Production Of Fuel From Waste Plastic**	**Mr. Prashanth D A**	Mr. Akhilraj E S Mr. Akhil K S Mr. Abraham Mathew Mr. Anirudh K	**10,000/-**
4	Applied	**Electricity Generation From Hydrodynamic Behavior Of Floating Substances In Directional Seas**	**Dr. Vighnesha Nayak**	Vighnesh R Pai Deepa A S Harshith Shetty Manish K Anchan	**NA**
5	Applied	**Experimental And Computational Analysis Of Co-Centric Tube Heat Exchanger With Pin-Fin**	**Mr. Prakhyath**	Shravan K Pavan Kumar Sharan C Shravan P C	**NA**
5	Applied	**Design and Fabrication Of Aeroleaf Wind Turbine.**	**Mr. Nithin Shet**	Kavan K Pratheek B V Roshan Dsouza Dheeraj	**NA**
5	Applied	**Automated Wheelchair Cum Stretcher**	**Dr. Rajesh Rai P**	Ritvik P Shetty Sarvesh S Harshith V Shetty Shanthanu Sudhas	**NA**

NBA - DEPARTMENT WORK

Uploaded SAR to NBA on June 11th, 2022

National Board of Accreditation (NBA)

What is accreditation?

Accreditation is a process of quality assurance and improvement, whereby a programme in an approved Institution is critically appraised to verify that the Institution or the programme continues to meet and/or exceed the Norms and Standards prescribed by regulator from time to time. It is a kind of recognition which indicates that a programme or Institution fulfills certain standards.

Why accreditation?

The purpose of the accreditation by NBA is to promote and recognize excellence in technical education in colleges and universities - at both the undergraduate and post graduate levels. Institutions, students, employers, and the public at large all benefit from the external verification of quality provided through the NBA accreditation process. They also benefit from the process of continuous quality improvement that is encouraged by the NBA's developmental approach to promote excellence in technical education. Through accreditation, the following main purposes are served:

- Support and advice to technical institutions in the maintenance and enhancement of their quality of provision.
- Confidence and assurance on quality to various stakeholders including students.

- Assurance of the good standing of an Institution to government departments and other interested bodies.
- Enabling an Institution to state publicly that it has voluntarily accepted independent inspection and has satisfied all the requirements for satisfactory operation and maintenance of quality in education.

Impact of accreditation

The purpose and impact of accreditation goes far beyond quality assurance of an Institution and its programs. Major impacts of accreditation system are summarized below:

- Encourages quality improvement initiatives by Institutions.
- Improves student enrolment both in terms of quality and quantity.
- Helps the Institution in securing necessary funds.
- Enhances employability of graduates.
- Facilitates transnational recognition of degrees and mobility of graduates and professionals.
- Motivates faculty to participate actively in academic and related Institutional/departmental activities.
- Helps create sound and challenging academic environment in the Institution, and Contributes to social and economic development of the country by producing high-quality technical manpower.

Benefits and Significance of Accreditation

Accreditation is a tool that stakeholders use to monitor, assess and evaluate the standards and quality of the education a student receives at a college, university or other institution of higher learning. Some of the major benefits enrolled students receive by attending an accredited institution/program are as follows:

- Accredited institution/program offers the highest quality education available.
- Accredited institution/program strengthens consumer's confidence, employers value degrees of an accredited program the most.

- Accreditation helps institutions to know their strengths, weaknesses and opportunities, pushes them to continuously improve their programs and give them a new sense of direction, identity and targets and
- Accredited institution/program demonstrates accountability to the public, commitment to excellence and continuous quality improvement.

Who Gets Accredited?

Individuals, courses, and institutions are not accredited. NBA only accredits programs in Engineering, Computer Application, Pharmacy, Management, Hotel Management and Catering Technology.

Accreditation Policy

General Information on Accreditation

The following general policies are the guiding principles for accreditation of programs offered by various technical institutions:

i) NBA accredits selected technical Programs of institutions and not the Institutions or its Departments / Centres as a whole.

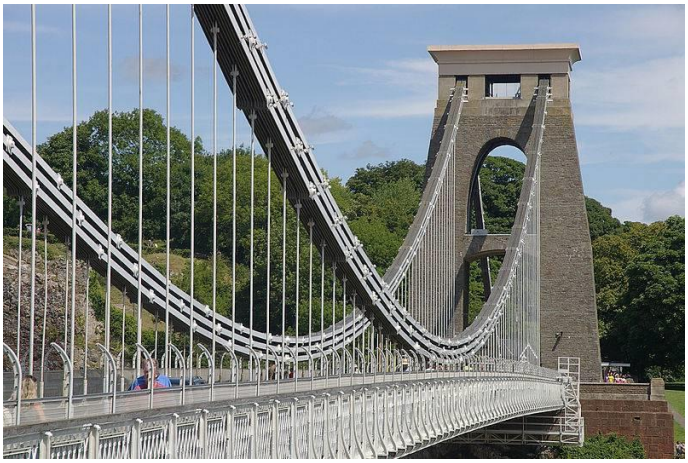
ii) Institutions are invited to apply for accreditation through eNBA portal as per norms prescribed by NBA from time-to-time.

iii) Programs to be accredited should be offered by an educational Institution, which has been formally approved by the AICTE or the concerned regulatory authority.

iv) Programs from which at least two batches of students have graduated are considered for accreditation. The program should continuously be running without break with approval of the concerned regulatory authority during the whole duration of last two batches (for example: 5 years for UG engineering, 3 years for PG engineering, etc.).

Mechanical Engineering Innovations That Helped Define Mechanics Today.

1. Steel Was the Precursor to Many Later Mechanical Engineering Marvels



Steel, an alloy of iron and carbon, has been known since the Iron Age. But for most of this time, the quality of steel produced varied widely.

The first blast furnaces capable of making usable steel began appearing in China around the **6th Century BC** and would spread into Europe during the Middle Ages. By the **17th Century** steel-making was more or less well-understood, and by the **19th Century** production methods and quality were improved dramatically with the development of the Bessemer process.

Early metallurgists realized that when iron gets very hot it begins to absorb carbon. This, in turn, reduces the melting point of iron as a whole and makes the final product brittle.

They soon realized that they needed to find a way of preventing the high carbon contents to make iron products less brittle.

In around **1050 AD** the precursor to the modern **Bessemer Process** was developed. This process decarbonized the metal through repeated forging under a cold blast.

Although this process was far less efficient than Bessemer's later development, it would form a critical step in the development of the metallurgy of iron and steel.

The most important development was made by Henry Bessemer himself, in **1856.** He developed a way of blowing oxygen through molten pig iron to reduce the carbon content relatively cheaply and at scale, thus creating the modern steel industry.

2. Sailing ships open up the oceans

The very first depiction of a sailed ship dates back to around **3300 BC** and is found in an Egyptian painting. These early boats featured a square sail as well as banks of oars.

As they were confined to the Nile River and depended on winds within a narrow channel, it was vital to retain oars for use during times of insufficient wind speed.

This combination of sail and oar dominated early ships for centuries, reaching heights of technological advancements with the triremes of the classical period.

The **first sails** were probably made of animal skins, but these were replaced with woven reed mats and eventually cloth, in predynastic Egypt.

Later sails used in Europe were made of woven flax fiber, which is still used today, although it has been largely replaced by cotton. Sailed ships would enable the long-distance exploration of the seas and open up new trade routes. They would, in effect, shrink the world and allow previously disconnected nations to exchange goods and knowledge.

They would also enable some nations to expand their influence around the world and, in some cases, assist in the creation of an empire. Trade and empire would provide incentives to further drive advancement in ship technology and mechanical engineering to the present day.

3. The printing press industrialized bookmaking.

The printing press was one of the most important inventions in mechanical engineering and in human history. Johannes Gutenberg's adaptation of the printing press was groundbreaking in its own time and set the stage for enormous advancements in printing made during the Renaissance and **Industrial Revolution**.

Movable type printing had been around for some time before Gutenberg, notably in China, but his device was the first to mechanize the process of applying text and images to paper en masse.

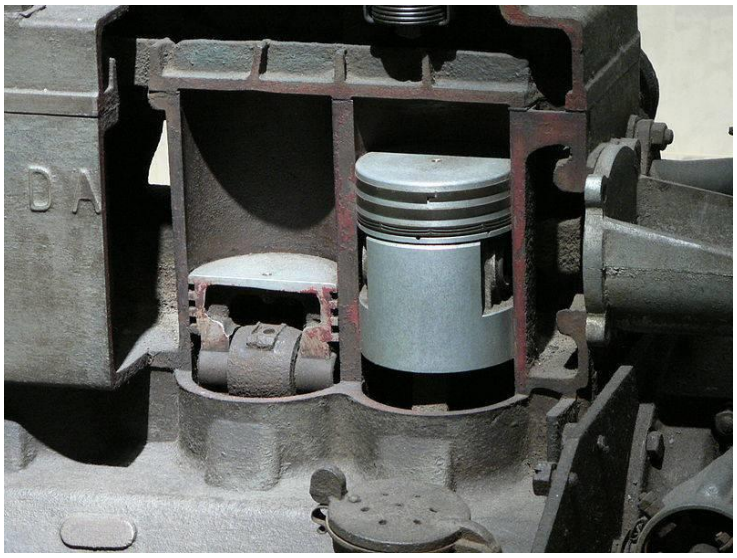
Gutenberg's press was modeled on the ancient wine presses of the Mediterranean and was, in fact, made from a modified wine press. It was also designed on the existing presses of the medieval period.

His press worked by rolling ink over a pre-arranged raised surface of movable text held within a wooden frame. This was then pressed against a sheet of paper to create a copy.

This process was vastly more efficient than other presses of the time, not to mention the previous process of hand-copying books.

The press would allow books to be produced more quickly, and, most importantly, more cheaply, enabling more and more people to afford to buy them. This would mark a watershed in human and engineering history.

4. The piston is a vital component of reciprocating engines.



The invention of the piston is widely credited to French physicist Denis Papin, in **1690 AD**. His design for a steam piston engine was built upon by later inventors like Thomas Newcomen and James Watt during the **18th Century**.

Its invention, along with other advancements in steam engine technology, would mark the 'true' beginning of the **Industrial Revolution**.

Pistons are generally contained within a cylinder that is made air-tight by the use of piston rings. In modern engines, the piston serves to transfer force from expanding gas in the cylinder into reciprocating motion on a crankshaft. This process is effectively reversed when applied to pumps.

Today, pistons are essential components in many reciprocating engines, pumps, compressors, and other similar devices.

5. Levers give you mechanical advantage

"Give me a place to stand, and I shall move the Earth with it," is a remark of Archimedes, who formally stated the correct mathematical principle of levers" - **Pappus of Alexandria**.

The lever, yet another simple engine, consists of a beam (or rigid rod) that pivots on a fixed hinge or fulcrum. Levers are incredibly useful devices that can provide mechanical advantage to move very heavy objects with relatively little effort, otherwise known as leverage.

Depending on where the fulcrum is located in relation to the load and effort, levers can be divided into three types:

- Class 1 levers are those where the fulcrum is located in the center of the beam. Examples include a seesaw and a crowbar.
- Class 2 levers are those where the load (resistance) is located in the middle. Examples include a wheelbarrow and brake pedal.
- Class 3 levers are those where the effort is located in the middle. Examples include tweezers and the jaw.

Levers are first identified in the works of Archimedes in the **3rd Century BC.**

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