



# ROHINI

COLLEGE OF ENGINEERING & TECHNOLOGY

Approved by AICTE and Affiliated to Anna University, (An ISO Certified Institution)



## MECHTRON'19

[2018-2019]

Annual Technical Magazine **ISSUE III**

## DEPARTMENT OF MECHANICAL ENGINEERING

This magazine is designed by the Department of Mechanical Engineering for developing and cultivating the students in literary and study habits.



# ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY

Approved by AICTE and affiliated to Anna University, (An ISO Certified Institution)  
Anjagrammam main Road, Palkulam 629401, Kanyakumari District

## MECHTRON 2019 (2018 -2019)

**ANNUAL TECHNICAL MAGAZINE**

**DEPARTMENT OF MECHANICAL ENGINEERING**



# MECHTRON 2019

2018-19

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## **ABOUT DEPARTMENT**

- The Department of Mechanical Engineering started in the year 2012 with an initial intake of 60 students to the B.E Program and increased to an intake of 120 students from 2013 and 180 students from 2014. The Department offers ME - Thermal Engineering programme from 2015 with an intake of 24 students. The Department is a recognized research Centre by Anna University Chennai from the year 2019. The department accomplish outcome Based Education which help the students to learn, develop and serve to the society. The Department has experienced and dedicated faculty with a wide range of specialization namely Thermal Engineering, Engineering Design, Manufacturing Engineering, Energy Engineering, CAD/CAM, Industrial Engineering and Mechatronics.
- The faculty members have published more than 100 papers in National/International journals/Conference and had written books, filed patterns during the last 3 years and received many awards. The students were motivated by providing lot of opportunities like technical presentation in Symposium, conferences for skill development. The department provide value added knowledge to under graduates and post graduate students. Apart from curriculum students were motivated to participate in sports. The department has well established laboratory facilities to conduct research work on different specialized areas like Material Science, Renewable Energy, Thermal Science. The students of the department have received external research funding from Tamil Nadu State council for Science and technology in recent years. The students of the departments have joined in reputed industries through placements and some of them are turned to be an entrepreneur. The department has a good network of alumni.

### **DEPARTMENT VISION**

To inculcate competence in the field of Mechanical Engineering in students by providing quality education and learning opportunities to enable them to become ethically strong engineers for the development of society.

### **DEPARTMENT MISSION**

To provide fundamentals and technical skills in Mechanical Engineering through effective teaching-learning methodologies.

To provide an ambience for research through collaborations with industry and academia.

To inculcate students with leadership quality and employability skills with ethical

## PEOS

### **PEO 1-**

Graduates will apply the knowledge of Mechanical Engineering concepts and innovative methods to solve real world Engineering problems.

### **PEO 2**

Graduates will have the required qualities for a successful carrier in Mechanical Engineering and related fields.

### **PEO 3**

Graduates will exhibit the professional skills with ethical values, Communication skills and team spirit

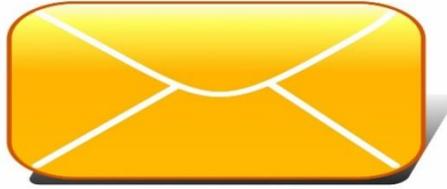
## PSOS

### **The graduates of the department will attain:**

Graduates of the program will achieve optimized design by utilizing their knowledge in thermal engineering, material science, manufacturing, fluid power and computer integrated manufacturing.

Graduates will be able to analyse and interpret by using modern tools and provide solutions to real time mechanical engineering and related problems.

Graduates will learn managerial skills to work effectively in a team and are aware of the impact of professional engineering solutions in human community, environmental context, ethics and be able to communicate effectively



FROM THE DESK OF

“Learning gives creativity, creativity leads to thinking, thinking provides knowledge, knowledge makes you great” - **Dr.A.P.J.Abdul Kalam.**



These words by - Dr.A.P.J.Abdul Kalam perfectly describe our aim at Rohini College of Engineering and Technology. Our aim is to teach students to LEARN, not just STUDY. Hence, we strive to travel beyond the boundaries of mere books.

I can proudly say that Rohini College of Engineering and Technology is the most modern and sophisticated multidisciplinary institution, imparting quality education and providing a wide and varied arena for the staff and students to showcase their academic and extracurricular talents.

RCET has made a tremendous progress in all areas crossing several milestones within a very short span of time. I feel happy to know that the students and faculty of Mechanical Engineering department of RCET bringing out the technical magazine MECHTRON.

The role of a department magazine is therefore vital in promoting what an institution offers. It brings out into the open things hitherto unrevealed. It brings to light the names of the unsung heroes and their mighty deeds.

I am proud to say that once our students step in RCET, they step out with self-confidence and knowledge to face all future endeavors with full conviction. Fly in the plane of Ambition, Land in the Airport of Success, The luck is yours the wish is mine. May your future always shine. Good Luck.

Cordially,

**Shri.K.NEELA MARTHANDAN**

**Chairman**

**Rohini Groups.**

FROM THE DESK OF

Dear All,

Service to Human being is Service to God. Creating better human beings' is our motto and we can do that when we are able to mould our students to be good human beings with values which are embedded for life. Now our special emphasis is on Outcome Based Education and Experiential Learning. The main focus of our college is to empower

students with sound knowledge, wisdom, experience and training both at the academic level of Engineering and in the highly competitive global industrial market.



It is a matter of immense pleasure and pride that Mechanical Engineering department RCET has shown consistent progress, year after year in academic and co-curricular activities. It's high standard in academics and commitment to quality technical education is reflected by the Alumni and the excellent placement records.

The Mechanical Department digital magazine is a platform for sharing educational information, activities and events related to the Mechanical Engineering Department of our college. Introducing the very first issue, I hope that the digital magazine will provide useful and relevant information. I wish the best for all our students, and the members of the department of Mechanical Engineering who reiterate their aims at providing the best in academic and extra-curricular fields. Once again, I wish all our students and faculty a successful and rewarding career.

Best Wishes,

Dr.R.RAJESH, M.E., Ph.D.

Principal

Rohini College of Engineering & Technology

Palkulam, Kanyakumari.

FROM THE DESK OF

Dear All,



Welcome to the Department of Mechanical Engineering at ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY, KANYAKUMARI. We have started our journey in the year of 2012. The primary focus of our department is to impart technical knowledge to students, promote their problem solving and innovative skills in the growing technologies. We have a long history in educating young minds, conducting

innovative research, and offering professional services to local and overseas communities. Mechanical engineering is one of the oldest and broadest engineering discipline, and plays a significant role in enhancing safety, economic vitality, enjoyment and overall quality of life throughout the world. A prerequisite for development is growth and that is directly related to production or output of a country. If production is done via a sustainable path it can maintain the sustainability of development.

A warm and Green Greetings from the Department of Mechanical Engineering at GNITC. The college has been simply unstoppable in its progress as it has been actively involved in various activities that have brought to light the hidden talents of the college students and staff. Mechanical Engineering is a professional Core engineering discipline that deals with the design, production and maintenance of any produce of any industry. The pride of every student and staff would be in his/her department and college.

Our department has a team of highly qualified and experienced faculty, good infra structure and lab facilities. We are striving hard continuously to improve upon the quality of education and to maintain its position of leadership in engineering and technology. We always work with the motto "Nothing can be achieved without genuine effort." The core values of the department help the students to develop their overall personality and make them worthy to compete and work at global level. Our faculty are continuously attending various training programs, publishing research papers, books and filing patents. Many are pursuing research. Our department has been conducting seminar / conferences to keep the faculty and students abreast with the latest developments in the field of technical education. We are happy to share that many students are pursuing higher studies in leading universities in India and abroad. I am certain that our students will prove to be an invaluable asset to an organization. We, Mechanical engineers to build the nation.

Best Wishes,

Dr. S INDRAN M.E, Ph.D  
HOD / Mechanical Engineering /RCET



FROM THE DESK OF EDITOR'S

It gives us great pleasure to bring you issue of **MECHTRON2019**, the Mechanical department technical magazine of Rohini College of Engineering and Technology, Kanyakumari.

The objective of the magazine is to mainly focus on Achievement of the students from the Mechanical Engineering department in the Co-curricular and Extra-Curricular Activities

The name and fame of an institute depends on the caliber and achievements of the students and teachers. The role of a teacher is to be a facilitator in nurturing the skills and talents of students. This magazine is a platform to exhibit the literary skills and innovative ideas of teachers and students **MECHTRON2019** presents the skills and innovative thinking of students and contributions of teachers.

We are also thankful to our Management and Principal for their support and encouragement.. Last but not the least we are thankful to all the authors who have sent their articles. We truly hope that the pages that follow will make an interesting read.



**Rohini College of Engineering and Technology**- a temple of learning, is an ISO certified institution was founded by the great Industrialist and Philanthropist, Shri. K.Neela Marthandan. The main objective of our college is to advance the knowledge base of the engineering professions and to influence the future directions of engineering education and practice.

**RCET** - Best Engineering College in Nagercoil, Kanyakumari District. We believe not only in educating the students, but also in grooming characters, with moral and ethical values to build the nation. Since the beginning, the college has been providing world-class facilities & infrastructure in education and learning. The emphasis is on transformational leadership rather than directional leadership. We aim to establish new trends, introduce innovative training methodologies, and thus guide students towards the road to success.



To be an academic institute of continuous excellence towards education, research in rural regime, and provide service to nation in terms of nurturing potentially higher social, ethical and engineering companion graduands.



To foster and promote technically competent graduands by imparting the state of art engineering education in rural regime.

To enunciate research assisted scientific learning by dissemination of knowledge towards science, agriculture, industry and national security.

## Alcohol as an Alternative Fuel in I.C. Engines

In this century, it is believed that crude oil and petroleum products will become very scarce and costly. Day-to-day, fuel economy of engines is getting improved and will continue to improve. However, enormous increase in number of vehicles has started dictating the demand for fuel. With increased use and depletion of fossil fuels, alternative fuel technology will become more common in the coming decades. Because of the high cost of petroleum products, emission problems some developing countries are trying to use alternate fuels for their vehicles.

### Liquid Fuels

Liquid fuels are preferred for IC engines because they are easy to store and have reasonably good calorific value. The main alternative is the alcohol.

### Alcohol

Alcohols are attractive alternate fuels because they can be obtained from both natural and manufactured sources. Methanol and ethanol are two kinds of alcohols that seem most promising.

### Advantages

1. It is a high octane fuel with anti-knock index numbers of over 100. Engines using high octane fuel can run more efficiently by using higher compression ratios. Alcohols have higher flame speed.
2. It produces less overall emissions compared to gasoline.
3. When alcohols are burned, it forms more moles of exhaust gases, which gives higher pressure and more power in the expansion stroke.
4. It has high latent heat of vaporization which results in a cooler intake process. This raises the volumetric efficiency of the engine and reduces the required work input in the compression stroke.
5. Alcohols have low sulphur content in the fuel.
6. Reduced petroleum imports and transportation.

**Mr. R. DAVID**  
**Assistant Professor/MECH**

## key trends which will rule the mechanical engineering industry in the coming years..

- **3D Printing**

Additive Manufacturing, also known as 3D Printing is simply the addition of the material for creating a 3D effect. It is a complex process where the object's model has to be created using the CAD Software which is basically a modeling software and further has to be saved in the STL format.

This format mainly “slices” the given object into layers that are ultra-thin. Each successive layer is bonded to the layer preceding it, in which the material is melted partially or completely melted. This particular file then has to be transferred to the 3D Printing Machine for the production of a 3D object converted into the formation of fine layers.

- **Nano technology**

Nano technology is also known as nanotech, is the manipulation of matter into molecular, atomic or supramolecular scale. The National Nanotechnology Initiative has stated nanotechnology as the manipulation of matter in which a minimum of one dimension is sized from 1 to 100 nanometers. This definition helps in understanding the importance of mechanical effects on the quantum-realm scale. Nanotechnology also helps in the creation of new devices and materials with a vast number of applications.

- **Internet of Things (IoT)**

The Internet of Things(IoT) is a system in which computing devices are interrelated, along with digital and mechanical machines, animals, objects or people that are provided with identifications that are unique and the ability to transfer data over a network without the requirement of human-to-computer or even human-to-human interactions. Internet of Things has evolved in the last couple of years due to the evolvment in multiple technologies. Internet of Things is most popular with products that pertain to the idea of smart homes.

Mr. M. RAJAKUMAR

Assistant Professor/ MECH

# hydrogen-fueled fuel cell vehicle.

An automotive fuel cell system can use a variety of fuels, and the selection of a fuel depends on factors such as the fuel supply infrastructure, the cost of fuel, the complexity and cost of storage, safety, environmental implications, and the national energy policy. The proper storage of hydrogen is critical for the mass commercialization of fuel cell vehicles. Hydrogen can be stored in many forms, such as compressed gas, liquid, or as **metal hydrides**. Tanks that hold compressed gases are large and bulky. The average fuel efficiency of new cars is between 20 and 30 mpg; European and Japanese cars average even less. Current vehicles hold 10 to 16 gallons of gasoline, or 30 to 45 liters of space. Since hydrogen has twice the efficiency of gasoline vehicles, they can theoretically store between 5 to 8 kg of hydrogen, which is equivalent to between 200 and 400 L—a sizable reduction in the space needed for fuel. Liquid hydrogen tanks are less bulky but must be stored at extremely low temperatures.



Certain automobile manufacturers have resorted to using other fuels for fuel cells, but most manufacturers still choose pure hydrogen as the option for the future. Another option for hydrogen is the onboard reforming of various fuels or directly feeding various fuel types into the fuel cell. Onboard reforming may eliminate the problem of onboard storage and the lack of hydrogen infrastructure. However, fuel cell vehicles with onboard processors present several issues:

- The vehicles do not have zero emissions.
- Reformed hydrogen is not pure, and therefore decreases the fuel cell's efficiency.
- Onboard reforming increases the complexity, size, weight, and cost of the entire system.
- The long-term effects of fuel impurities on the fuel cell stack.

There are several companies that are currently working on home hydrogen generation stations based upon **solar power, wind turbines, or biofuel**. These low-emission methods of generating hydrogen are preferred over the traditional methods of creating hydrogen – which generate various degrees of pollution. Ultimately, the goal is to use hydrogen from non-polluting sources such as chemical reactions, solar panels + electrolysis, or wind power + electrolysis.

Mr. M.Stanly Selva Kumar

Assistant Professor/ MECH

# Most Important Manufacturing Trends

## ➤ **Global Virtual Workforce: Merging Extended Reality with the Internet**

U.S. manufacturers have struggled to find STEM-educated employees to staff their increasingly technologically advanced workplaces. But on the horizon lies a solution that will benefit businesses worldwide: the merging of extended reality—from virtual reality and augmented reality to mixed reality and augmented virtuality—with global interconnectivity.

## ➤ **Linking the Human Brain to Machines**

The concept of connecting human brains to machines has gained publicity due to the interest of Elon Musk, who famously prophesied that the advancement in AI means humans must eventually merge with computers or become irrelevant. Not one to just make predictions, he founded a company (Neuralink) to develop implantable brain-computer interfaces (BCIs), with the short-term goal of treating serious brain disease and brain damage caused by a stroke.

## ➤ **Nano-Based Preventive Maintenance**

In the 1966 film “Fantastic Voyage,” the government shrinks a submarine crew to microscopic size, then shoots them into the body of an injured scientist to repair his damaged brain. Now sci-fi has become a reality, as quantum physics combines with the digital world in medicine.

## ➤ **Internet of Goods: Local Production and Local Distribution**

Along with more customization made possible with robots and 3D printing, and the use of cloud computing enabling even small factories to tap into new technologies, this “Internet of Goods” will allow the creation of new business models capable of expanding the market and changing the geography of production.

## ➤ **The Exponential Generation of Leadership**

All eyes are justifiably on the millennial generation (born 1980-1999), as the oldest of them prepare to take over leadership roles in the business world. But it's the following generation – whom I labeled the "exponentials" a few years ago – that manufacturers need to put on their radar. This cohort, with birthdates starting around the turn of the millennia, is just starting to populate college campuses and technical schools around the country. They have never known a world without smartphones, the internet, virtual reality, and artificial intelligence.

Mr. S. Kailainathan

## Thermal Expansion

The thermally induced change in the length of a thin strip of metal differs for each material. For example, when heated, a strip of steel would expand by half as much as an equal length piece of aluminum. Welding together a thin piece of each of these materials produces a bimetallic strip

The difference in expansion causes the bimetallic strip to bend when the temperature is changed. This movement has many common uses including: thermostats to control temperature, oven thermometers to measure temperature, and switches to regulate toasters. Some practical solutions to everyday thermal expansion problems in solids are:

1) The material developed for filling teeth has the same expansion as the natural enamel of the tooth.

2) The steel developed to reinforce concrete has the same expansion as the concrete.

3) Concrete roads are poured with expansion joints between the slabs to allow for thermal expansion (these joints are the cause of the thumping noise commonly experienced when traveling on a concrete highway).

Mercury and alcohol thermometers function because of the expansion difference between liquids and solids. Because the liquid expands at a different rate than the tube, it rises as the temperature increases and drops as the temperature decreases.

Because the liquid expands at a faster rate than the tube, it rises as the temperature increases and drops as the temperature decreases. The first step in producing a thermometer scale is to record the height of the liquid at two known temperatures (i.e., the boiling point and freezing point of water). The difference in fluid height between these points is divided into equal increments to indicate the temperature at heights between these extremes.

Automobile engine coolant systems provide a practical example of a liquid-thermal expansion problem. If the radiator is filled with coolant when the engine is cold, it will overflow when the engine heats during operation. In older car models, the excess fluid produced by the hot temperatures was released onto the ground. Periodic replacement was required to avoid overheating. Newer cars have an overflow container that collects the released fluid during thermal expansion and returns it to the radiator as the engine cools after operation.

# STUDENTS PAGE

## *SEVEN WAYS TO MAKE MONEY ONLINE*

“Money is only a tool. It will take you wherever you wish, but it will not replace you as the driver.”



**Starting Your Own Blog**

**Affiliate Marketing**

**Start Your Own E-commerce Website**

**Online Publishing (E-books)**

**Online Surveys**

**Online Freelancing**

**Coaching and Consulting Online**

**PASSION NEVER ENDS..**

**“Ride as much or as little, as long or as short as you feel. But ride”**



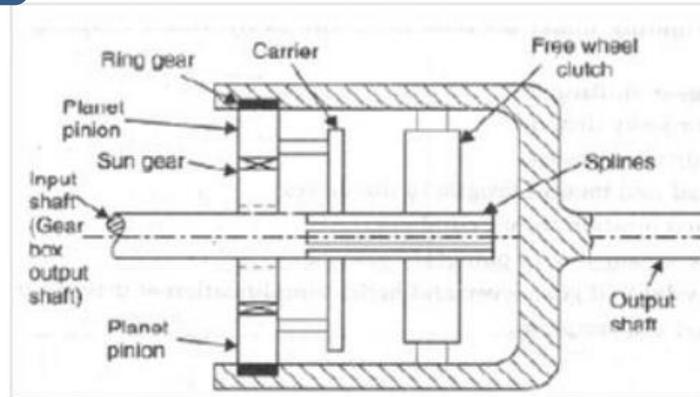
Alen John Punnoose

IV /Mech

## HEALTH TIPS...

- **Eat a variety of foods**
- **Base your diet on plenty of foods rich in carbohydrates**
- **Replace saturated with unsaturated fat**
- **Enjoy plenty of fruits and vegetables**
- **Reduce salt and sugar intake**
- **Eat regularly, control the portion size**
- **Drink plenty of fluids**
- **Maintain a healthy body weight**
- **Get on the move, make it a habit!**
- **Start now! And keep changing gradually..**

## OVER DRIVE...



The power needed to propel a car at any given set of conditions and speed is straightforward to calculate, based primarily on the total weight and the vehicle's speed. These produce two primary forces slowing the car: rolling resistance and air drag. The former varies roughly with the speed of the vehicle, while the latter varies with the square of the speed. Calculating these from first principles is generally difficult due to a variety of real-world factors, so this is often measured directly in wind tunnels and similar systems.

The power produced by an engine increases with the engine's RPM to a maximum, then falls away. This is known as the point of maximum power. Given a curve describing the overall drag on the vehicle, it is simple to find the speed at which the total drag forces are the same as the maximum power of the engine. This defines the maximum speed the vehicle is able to reach. The rotational speed of the wheels for that given forward speed is simple to calculate, being the tire circumference multiplied by the RPM. As the tire RPM at maximum speed is not the same as the engine RPM at that power, a transmission is used with a gear ratio to convert one to the other.

At even slightly lower speeds than maximum, the total drag on the vehicle is considerably less, and the engine needs to deliver this greatly reduced amount of power. In this case the RPM of the engine has changed significantly while the RPM of the wheels has changed very little. Clearly this condition calls for a different gear ratio. If one is not supplied, the engine is forced to run at a higher RPM than optimal. As the engine requires more power to overcome internal friction at higher RPM, this means more fuel is used simply to keep the engine running at this speed. Every cycle of the engine leads to wear, so keeping the engine at higher RPM is also unfavorable for engine life.

If one runs the same RPM transmission exercise outlined above for maximum speed, but instead sets the "maximum speed" to that of highway cruising, the output is a higher gear ratio that provides ideal fuel mileage. In an era when cars were not able to travel very fast, the maximum power point might be near enough to the desired speed that additional gears were not needed. But as more powerful cars appeared, especially during the 1960s, this disparity between the maximum power point and desired speed grew considerably. This meant that cars were often operating far from their most efficient point. As the desire for better fuel economy grew, especially after the 1973 oil crisis, the need for a "cruising gear" became more pressing.

“Beauty is power; a smile is its sword.”



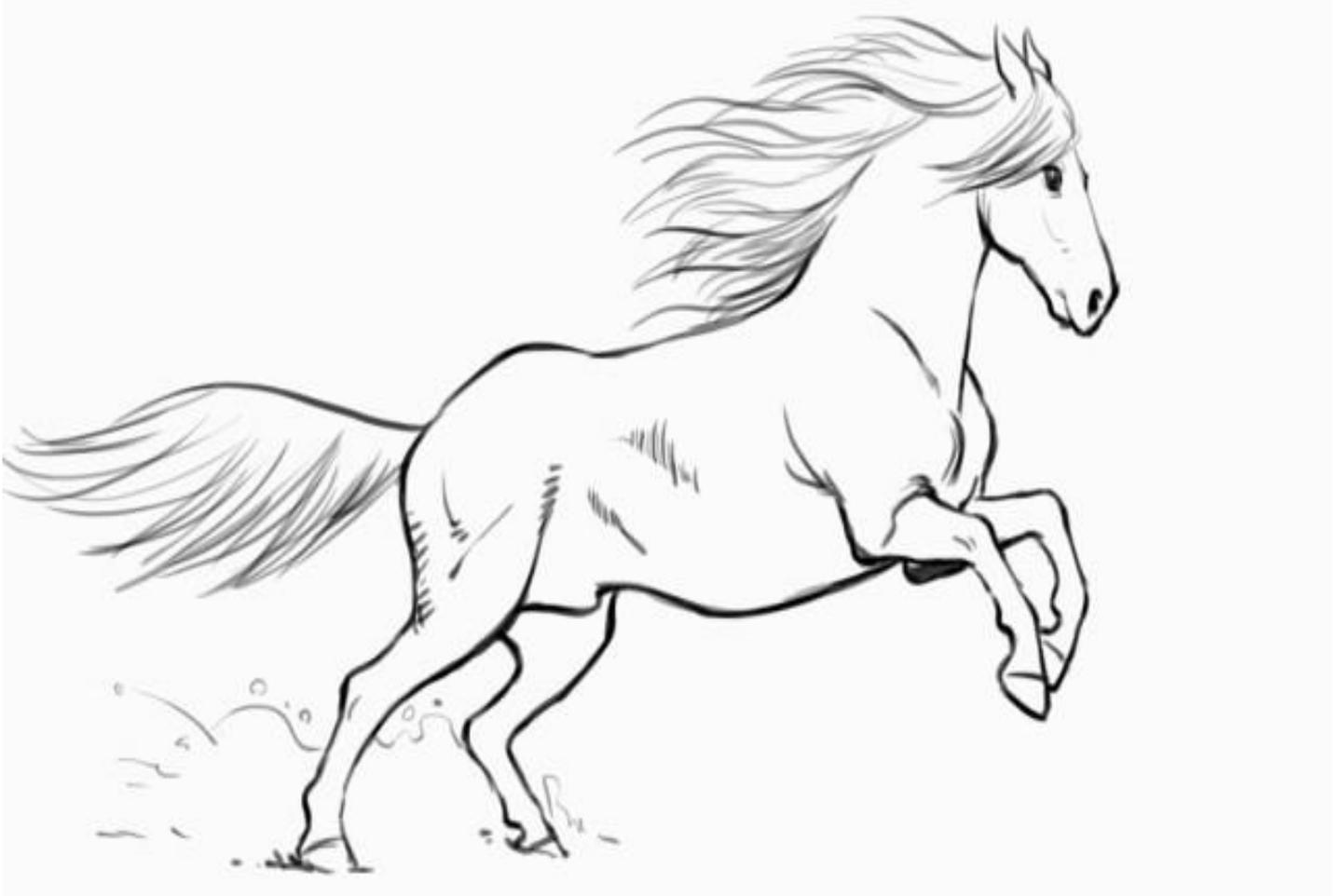
Simon  
II yr/ Mech



KEEP STRESS FREE....

- Keep a positive attitude.
- Accept that there are events that you cannot control.
- Be assertive instead of aggressive. Assert your feelings, opinions, or beliefs instead of becoming angry, defensive, or passive.
- Learn and practice relaxation techniques; try meditation, yoga.
- Exercise regularly. Your body can fight stress better when it is fit.
- Eat healthy, well-balanced meals.
- Learn to manage your time more effectively.
- Set limits appropriately and say no to requests that would create excessive stress in your life.
- Make time for hobbies and interests.
- Get enough rest and sleep. Your body needs time to recover from stressful events.
- Don't rely on alcohol, drugs, or compulsive behaviors to reduce stress. Drugs and alcohol can stress your body even more.
- Seek out social support. Spend enough time with those you love.

**“There is nothing so good for the inside of a man as the outside of a horse.”**



**Abinesh  
IV Yr/ MECH**

## TALENTS...



**II Year Students participated Technical events  
In JAMES College Of Engineering.**



**III yr student won the prize for paper  
Presentation in DMI Engineering Collge**



**IV Yr students participated and won the Prizes in Technical  
events conducted by CAPE institute of Technology**



**IV yr Student won the prize for Paper presentation in  
Noorul Islam Centre for Higher Education**

## LIMACON MOTION

A number of mechanical linkages are available to impart limaçon motion to the lenticular two-lobe rotor of the limaçon positive displacement machine. The features of the limaçon motion can be summarized as follows;

- i) The centre point on the chord remains attached to the circumference of a base circle and rotates about the centre of that circle at twice the rotational speed of the chord itself.
- ii) The chord is permanently attached to point  $o$  on the circumference of the same circle where it is allowed to slide and rotate.
- iii) The instantaneous centre of the rotor falls on the base circle diametrically opposite the rotor centre point.

Besides the linkage shown in Fig. , a number of other mechanical drives have been proposed to operate limaçon machines as can be found in patents dated as far back as the 1890s. For example, a cam-assisted drive, similar to that shown in Fig., was proposed by Wheildon (1896) and then by Georgiev (1981). Another cam-assisted linkage has been featured by Trapalis (2005), except in this new design the rotor is equipped with a circular sliding surface to facilitate gliding over the stationary cam contour as shown in Fig.

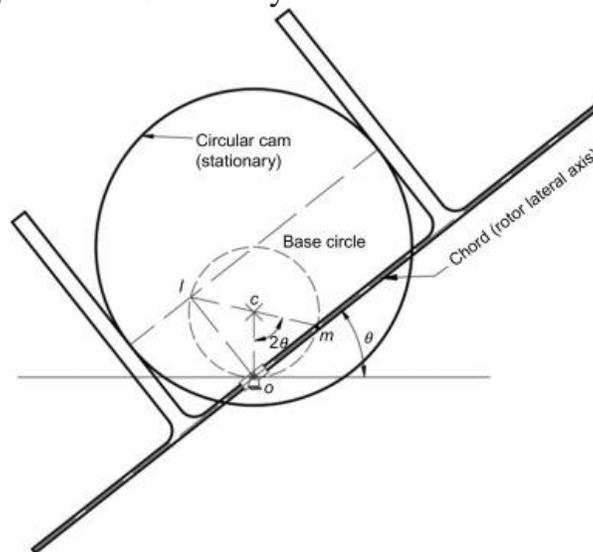
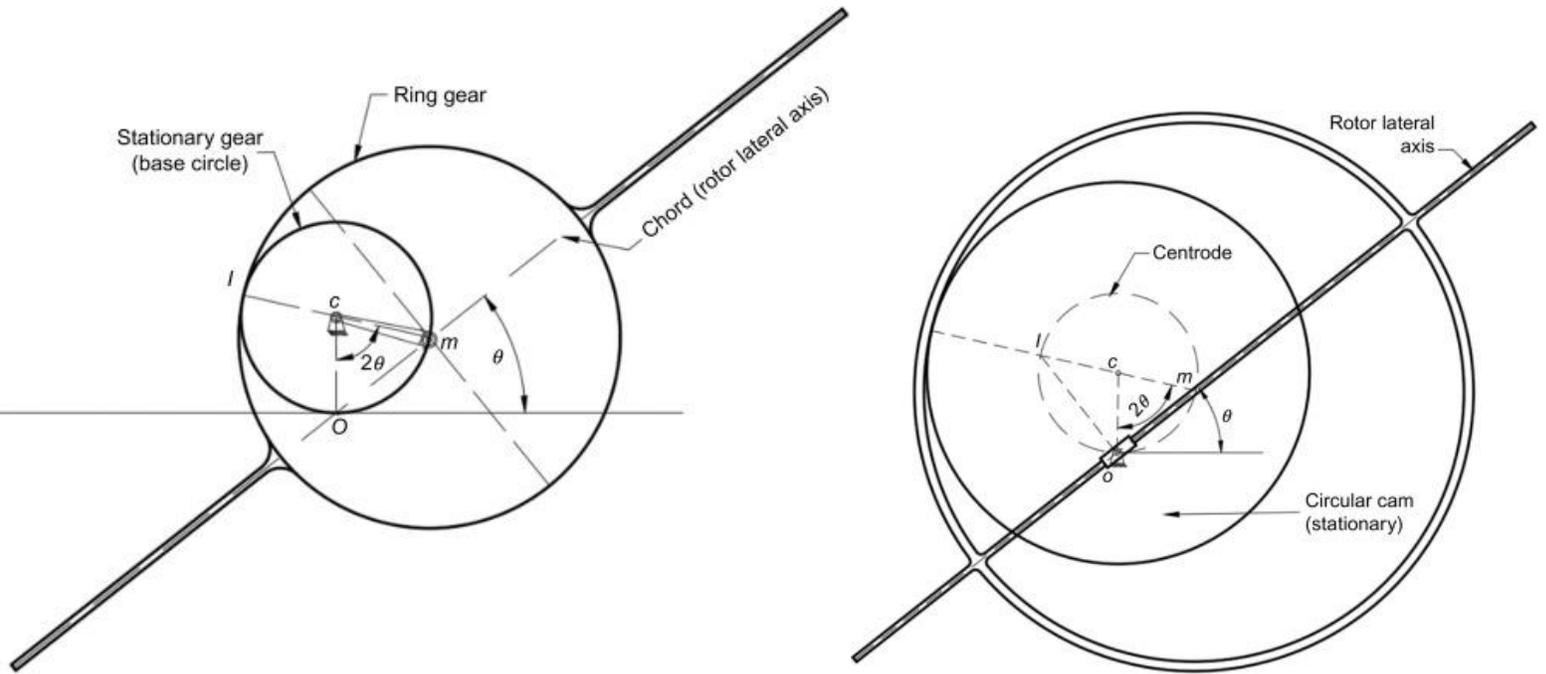
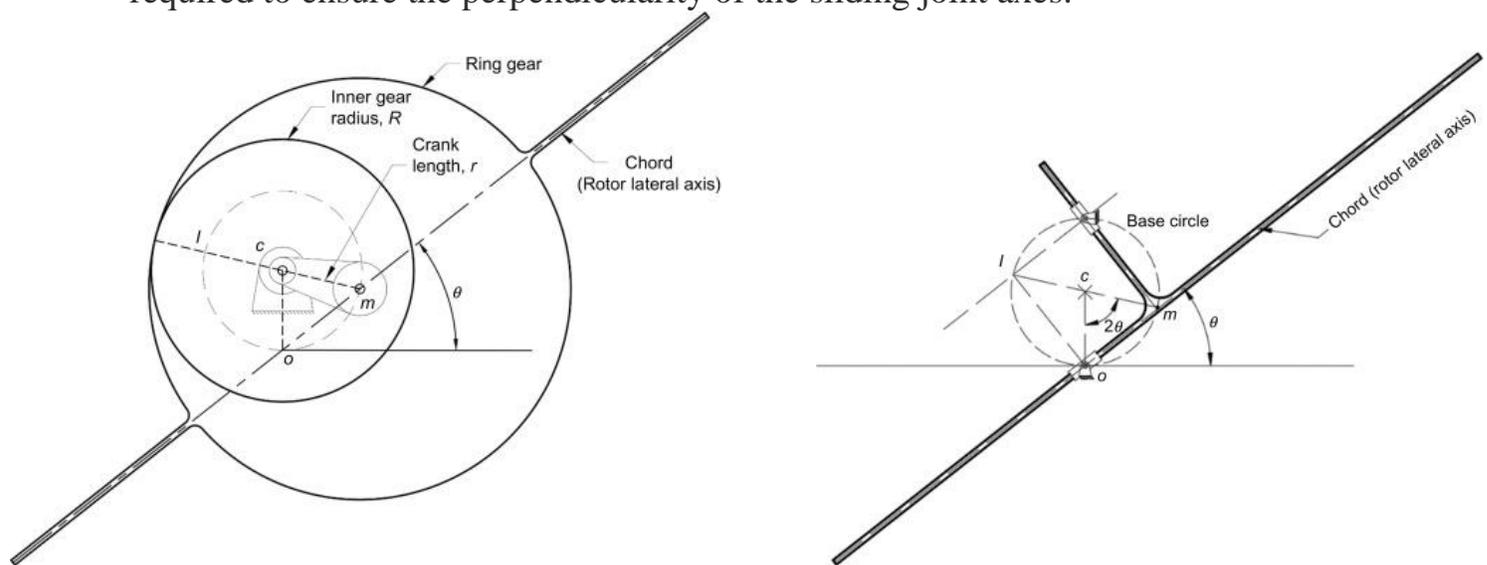


Fig. depicts another limaçon drive based on the epicyclical gear trains as proposed by Planche (1920, 1927). A similar design appeared again in a patent issued to describe a new pump design proposed by Nystrom (2016). Perhaps the most complex geared limaçon design has been featured by Moore (1975). Moore's design is featured in Fig. only schematically as the actual patent application discusses the intricate details of how motion is transmitted to the inner gear from the drive shaft in a calculated fashion.

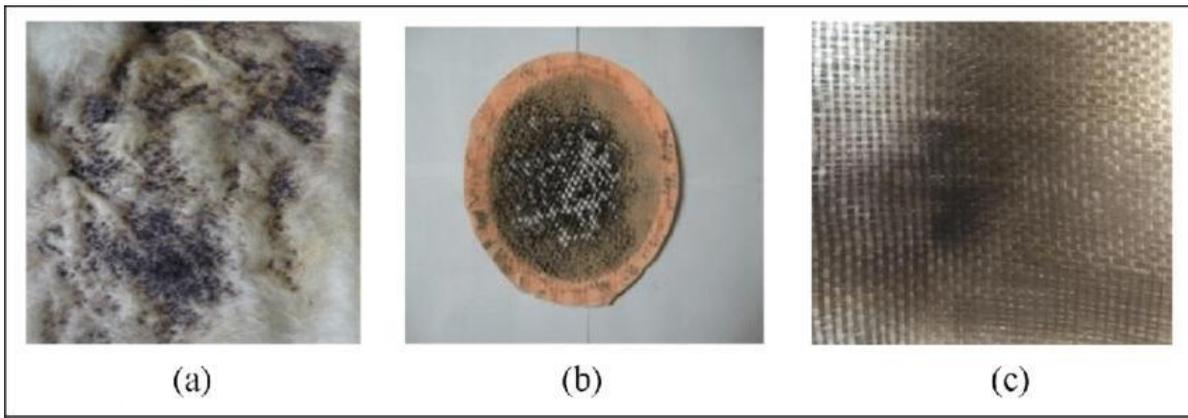


a design which utilizes two perpendicular sliders as has been proposed by Feyens (1927) and Frager and Menard (1962). This is an Oldham-coupling-like mechanism which Planche (1920) has also referred to but suggested replacing the sliders by circular pins. The double slider mechanism will obviously produce limaçon motion since the centre of the chord,  $m$ , would always fall on a base circle along with the pole,  $o$ . The diameter of the base circle is equal to the central distance between the two slider pivots, and the driveshaft is keyed to the slider that is located at the pole,  $o$ . This design will produce two compression-expansion cycles for every shaft revolution. The mechanism employs sliding motion on flat surfaces and is expected to exhibit mechanical losses which can be reduced by proper bearing design and lubrication schemes. Also, manufacturing accuracy would be required to ensure the perpendicularity of the sliding joint axes.



## Experimental investigation on the performance of non-metallic flexible fire-resistance materials in flameproof diesel engine locomotive

Three kinds of flexible refractory fiber materials were used to verify the performance of fire resistance, according to explosion-proof principle and test methods of flame arrests. Then, a comparison of transmission efficiency between flexible refractory fiber arresters and general arresters was given. The aim of this is to verify the properties of non-metallic flexible fiber materials in fire resistance and transmission efficiency so that we can apply it to the flameproof diesel engine locomotive.



Theoretically, refractory fibers have good performances of air permeability and complex internal space, so it can provide with absorption area. First, irregular porous structure increases the cooling area. The temperature of the flame can decrease under the ignition point and quench after the heat exchange. Tiny pores of the porous materials, moreover, increases the probability of absorbing free radicals during chain reaction so as to prevent the combination of free radicals and premixed gas. Then, the chain reaction will slow down and even terminate.

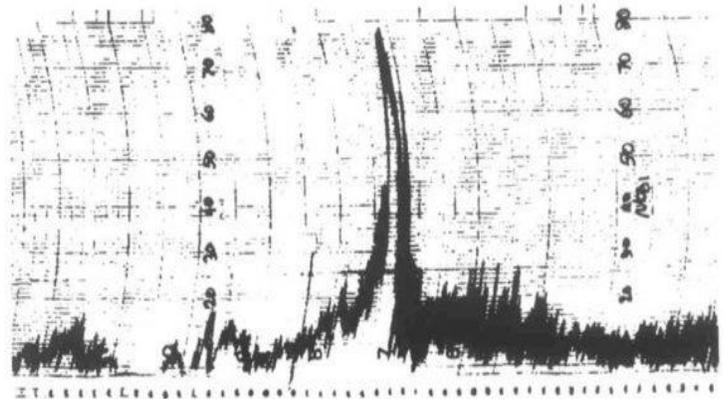
The investigation was aimed at testing the performances in fire-resistance and transmission efficiency of non-metallic flexible materials in flameproof diesel engine locomotive which may replace traditional metal flame arresters with low gas transmission efficiency. On the basis of the chain reaction mechanism, the mixed gas was burnt in the experiment, and the free radical which can be absorbed by tiny pores of flexible fiber materials and quenched was released.

Mr.Navin Jass

Assistant Professor /MECH

## Hybrid simulation of thunderstorm outflows and wind excited response of structures

In this simulation analysis, some parameters such as aerodynamic damping and transient aerodynamic effects were neglected. The obtained results also helped in getting the information about classic analysis. This was done about synoptic stationary cyclones. It was however observed that thunderstorms out flows often induce a major structural response as compared to synoptic stationary cyclones.



However, both synoptic and thunderstorms events experience similar qualitative responses as far as the dynamic response and wind loading on the structures are concerned. The same similarities for the two cases are too witnessed with the aerodynamic admittance. Structural components such as buildings, bridges, and tunnels are often affected by actions of winds and thunderstorms outflows.

The need to control their effects on structures has resulted in numerous researchers in the wind engineering field. The study by Professor Giovanni Solari and his team will help in gathering different data involving such structures which will thus be analyzed to produce robust results that may be further used in understanding other effects such as those resulting from aerodynamic damping.

**Mr. Abilesh**  
**Assistant Professor/MECH**

## Motivational Stories For Students To Work Hard

### Thinking Out of the Box

Once upon a time, a merchant named Sam owed a huge sum of money to Tom, a money lender. The time came when the merchant ran out of the last chance given to him to give the money back. Sam had a beautiful daughter who was very affectionate with her father. Tom asked the merchant to give all the money back failing which he will marry his beautiful daughter Tom was not at all good looking and ill minded and so the merchant was in dilemma. Tom proposed a new condition. There was a mix of black and white pebbles on the ground where they were standing. He will take two pebbles on both hands, one will be white and the other will be black.

If the daughter correctly chooses the white pebble, then Tom will write off all the debt and leave the marriage proposal too.

But if she chooses the black pebble, he will write off the debt but will marry the daughter.

Tom bent down to pick the pebbles from the ground and the daughter noticed that he took black pebbles on both hands. The girl had three choices- to notify the same to her father which may provoke Tom, take the black pebble and sacrifice her

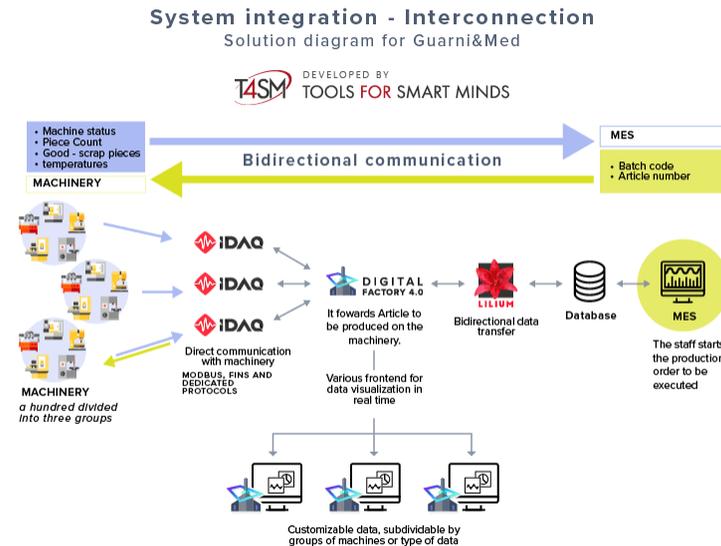
life or simply refuse to take the pebble which might land her father into trouble. But what she did totally surprise Tom.

She took the pebble from his hand and ‘accidentally’ the pebble fell off from her hand to ground. She then asked Tom to see which color pebble was left in his hand to identify the color she picked. Tom had no other choice but to show the black color pebble in his hand and set both of them free.

**Moral:** Sometimes, life offers you situations which not only demands hard work and perseverance but some creative thinking which saves the situation.



# MACHINE TO MACHINE (M2M)



Machine to machine (M2M) is direct communication between devices using any communications channel, including wired and wireless. Machine to machine communication can include industrial instrumentation, enabling a sensor or meter to communicate the information it records (such as temperature, inventory level, etc.) to application software that can use it (for example, adjusting an industrial process based on temperature or placing orders to replenish inventory). Such communication was originally accomplished by having a remote network of machines relay information back to a central hub for analysis, which would then be rerouted into a system like a personal computer. More recent machine to machine communication has changed into a system of networks that transmits data to personal appliances. The expansion of IP networks around the world has made machine to machine communication quicker and easier while using less power. These networks also allow new business opportunities for consumers and suppliers.

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# ROBOTICS

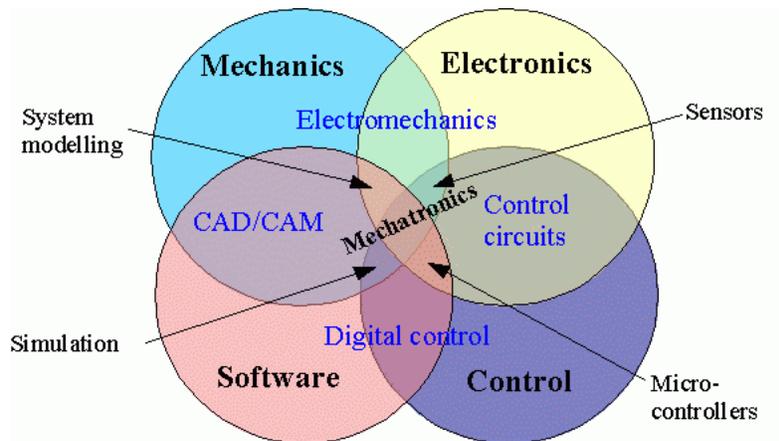


**Robotics** is an interdisciplinary branch of computer science and engineering. Robotics involves design, construction, operation, and use of robots. The goal of robotics is to design machines that can help and assist humans. Robotics integrates fields of mechanical engineering, electrical engineering, information engineering, mechatronics, electronics, bioengineering, computer engineering, control engineering, software engineering, mathematics, etc. Robotics develops machines that can substitute for humans and replicate human actions. Robots can be used in many situations for many purposes, but today many are used in dangerous environments (including inspection of radioactive materials, bomb detection and deactivation), manufacturing processes, or where humans cannot survive (e.g. in space, underwater, in high heat, and clean up and containment of hazardous materials and radiation). Robots can take any form, but some are made to resemble humans in appearance. This is claimed to help in the acceptance of robots in certain replicative behaviors which are usually performed by people. Such robots attempt to replicate walking, lifting, speech, cognition, or any other human activity. Many of today's robots are inspired by nature, contributing to the field of bio-inspired robotics. Certain robots require user input to operate while other robots function autonomously. The concept of creating robots that can operate autonomously dates back to classical times, but research into the functionality and potential uses of robots did not grow substantially until the 20th century. Throughout history, it has been frequently assumed by various scholars, inventors, engineers, and technicians that robots will one day be able to mimic human behavior and manage tasks in a human-like fashion. Today, robotics is a rapidly growing field, as technological advances continue; researching, designing, and building new robots serve various practical purposes, whether domestically, commercially, or militarily. Many robots are built to do jobs that are hazardous to people, such as defusing bombs, finding survivors in unstable ruins, and exploring mines and shipwrecks. Robotics is also used in STEM (science, technology, engineering, and mathematics) as a teaching aid.

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# MECHATRONICS ENGINEERING



**Mechatronics**, also called **mechatronics engineering**, is a sub major of mechanical engineering and an interdisciplinary branch of engineering that focuses on the integration of mechanical, electronic and electrical engineering systems, and also includes a combination of robotics, electronics, computer science, telecommunications, systems, control, and product engineering. As technology advances over time, various subfields of engineering have succeeded in both adapting and multiplying. The intention of mechatronics is to produce a design solution that unifies each of these various subfields. Originally, the field of mechatronics was intended to be nothing more than a combination of mechanics and electronics, hence the name being a portmanteau of the words "**m**echanics" and "e**l**ectronics"; however, as the complexity of technical systems continued to evolve, the definition had been broadened to include more technical areas. The word mechatronics originated in Japanese-English and was created by Tetsuro Mori, an engineer of Yaskawa Electric Corporation. The word mechatronics was registered as trademark by the company in Japan with the registration number of "46-32714" in 1971. The company later released the right to use the word to the public, and the word began being used globally. Currently the word is translated into many languages and is considered an essential term for advanced automated industry.

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## PERSONALITY DEVELOPMENT..

Personality development mainly focuses on the building blocks that helps to grow the personality of an individual such as self-esteem, etiquette and basic manners that most of us sometimes disregarded.

The modules that were encountered by the students in the prelim of the semester were basically divided in categories: self-esteem, table manners, common courtesy such as answering the telephone, writing a thank you letter and etiquette.

Self-esteem focuses on the development of the self confidence of an individual. It is one of the primary factors on how an individual growth and associate within his/her environment. Most of the people nowadays especially in the teenager level were lacking self-esteem. Having a lack of confidence were also associate like having a disease that stopping an individual to perform his/her tasks efficiently. This is because having a low level of self-esteem sometimes hinders him/her to open-up with others about his ideas and how he feels about the certain situation. To overcome this problem, there are many methods that can be done. Such as consulting to a psychiatrist, talking with the relatives about the problem, self-improvement such as writing down your strengths and weaknesses and how would you able to develop your weaknesses into strengths and how would you be able to improve more your strengths.

In basic table manners, there were a lot of simple etiquette that were discussed in the modules, in which most of us were discarded when we eat especially in fancy restaurants. Even for non-occasional dinner, proper table manners must be observed. There are two dining styles that were discussed namely, western and continental style. Whereas, continental style is the commonly used while the western style is used by most American countries.

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## COURSES OFFERED

### UG COURSES

- BE - CIVIL ENGINEERING
- BE - COMPUTER SCIENCE AND ENGINEERING
- BE - ELECTRONICS AND COMMUNICATION ENGINEERING
- BE - ELECTRICAL AND ELECTRONICS ENGINEERING
- BE - MECHANICAL ENGINEERING

### PG COURSES

- ME - COMMUNICATION SYSTEMS
- ME - COMPUTER SCIENCE AND ENGINEERING
- ME - THERMAL ENGINEERING
- ME - CONSTRUCTION ENGINEERING AND MANAGEMENT

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