# MECHAZINE

## DEPARTMENT OF MECHANICAL ENGINEERING


## 2019-20

GALGOTIAS COLLEGE OF ENGINEERING & TECHNOLOGY

# Mechazine

## HoD's Message:

Nurturing creativity and inspiring innovation are two of the key elements of a successful education, and a college magazine is the perfect amalgamation of both. It harnesses the creative energies of the academic community, and distils the essence of their inspired imagination in the most brilliant way possible. True to its name, this magazine gives an insight into the range and scope of the imagination and creativity of our students and faculty members. Hence, I am quite pleased to learn about the forthcoming issue of the magazine which is ready for publication. May all our students soar high in uncharted skies and bring glory to the world and their profession with the wings of education.

**Prof. Mohd. Asim Qadri**
(HoD-ME)

## Editor's Message:

It gives me immense pleasure to present the Sixth issue of "MECHAZINE-GMECH" magazine of the Department of Mechanical Engineering. It is the talent and outcome of our students which is reflected through this. This is one of the best platforms for our students to present multifaceted personalities and innovative ideas. I take this opportunity to thank our HOD, all the faculty members and students for their incessant support. I believe that this edition, will prove to be a success. I express my heartfelt gratitude to the editorial committee for their relentless efforts, the young writers for their valuable articles and all those who have been a part of "MECHAZINE-GMECH"

**Prof. M K Lohumi**

## Co-Editor's Message:

It is great pleasure for me to be a part of departmental magazine "MECHAZINE-GMECH". It is the matter of joy that we are going to publish the 6th edition of magazine. This magazine is the platform for our student and faculty members to give their immense views on latest trend of Mechanical engineering and to exhibit their literary skills. This magazine will be beneficial for our student to explore their knowledge on mechanical engineering.

**Mrs. Rashmi R. Maheshwari**

# CONTENT

# Missing Summer

The grass so green,
the sun so bright.
Life seems a dream,
no worries in sight.

Tans and tank tops,
laughter and bliss.
Each moment passes
without even a miss.

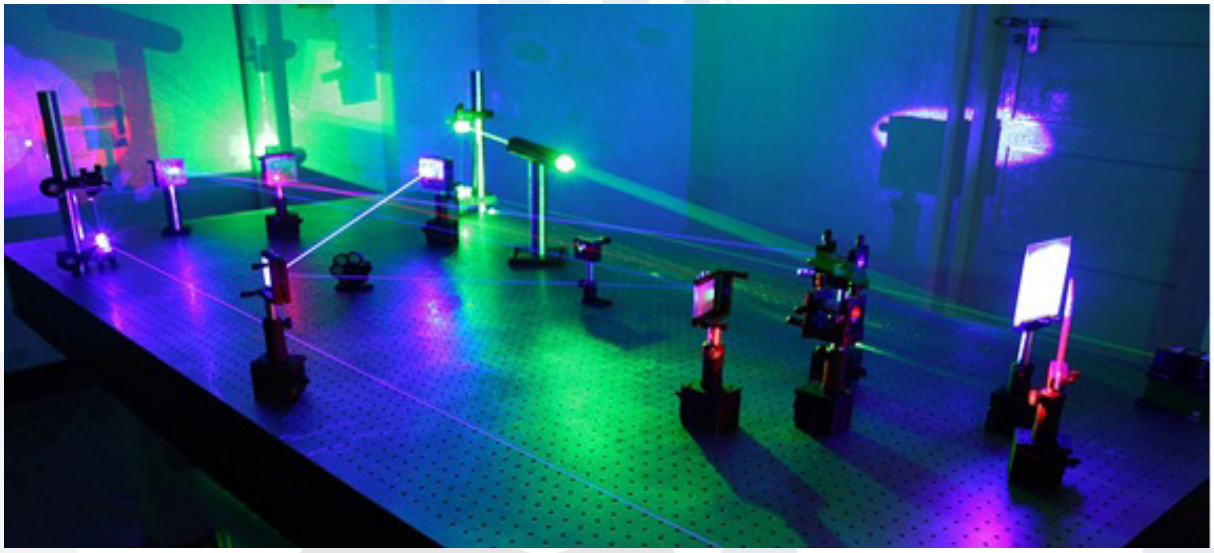
Friends and cookouts,
memories and laughs.
Good times to remember,
but how long will it last?

The grass soon fades,
leaves begin to fall.
School replaces sleepovers.
Oh, I'll miss it all.

- Katyayani (ME)

# HOLOGRAPHY

A hologram is a physical structure that uses light diffraction to make an image, the image can appear to be three dimensional. Holography is the science and practice of making holograms. Typically, a hologram is a photographic recording of a light field, rather than an image formed by a lens. The holographic medium, i.e., the object produced by a holographic process (which itself may be referred to as a hologram) is usually unintelligible when viewed under diffuse ambient light. It is an encoding of the light field as an interference pattern of variations in the opacity, density, or surface profile of the photographic medium. When suitably lit, the interference pattern diffracts the light into an accurate reproduction of the original light field, and the objects that were in it exhibit visual depth cues such as parallax and perspective that change realistically with the relative position of the observer. That is, the view of the image from different angles represents the subject viewed from similar angles.



In its pure form, holography requires the use of laser light for illuminating the subject and for viewing the finished hologram. A microscopic level of detail throughout the recorded scene can be reproduced. In common practice, however, major image quality compromises are made to eliminate the need for laser illumination to view the hologram, and in some cases, to make it. Holographic portraiture often resorts to a non-holographic intermediate imaging procedure, to avoid the hazardous high-powered pulsed lasers otherwise needed to optically “freeze” moving subjects as perfectly as the extremely motion-intolerant holographic recording process requires. Holograms can now also be entirely computer-generated to show objects or scenes that never existed.

Holography is distinct from lenticular and other earlier auto stereoscopic 3D display technologies, which can produce superficially similar results but are based on conventional lens imaging. Images requiring the aid of special glasses or other intermediate optics, stage illusions such as Pepper’s Ghost and other unusual, baffling, or seemingly magical images are often incorrectly called holograms.

- Jayesh Kumar (ME)

# Time Management - The key to being a successful student

Time management is not a skill we are usually taught growing up, so developing an organized approach to your studies is an opportunity to learn how to work more efficiently.

**Make a to-do list every day**

Put the most important tasks at the top, even if they're things you're dreading, and tackle them first. Include things you want to do on your list too, so you have items you're looking forward to. Try motivating yourself with a reward if you get to everything on your list.

**Set your priorities**

The objective of time management is to allocate time wisely, so you can achieve your goals. If you wanted to be an Olympic swimmer or ice skater, you would have to practice several hours a day for years. In the same way, to be a top student you must have a good idea of the study requirements. Even though each subject places different demands on your reading, writing, research, experiments, assignments, essays, projects, papers, presentations, tests, and exams by prioritizing, you will increase your chances of success. For each subject, decide how to complete all required tasks, over a weekly, monthly, and yearly basis. This advance planning will increase your awareness, making it less likely for you to squander time away meaninglessly.

**Plan activities logically**

Get to know your bodily cycle; then, schedule activities around it as much as possible. If you always feel sleepy after lunch, for example, use the time to get in your daily walk, instead of fighting to keep your eyes open over a book.

**Find your productive time**

Are you a morning person or a night person? You'll be more efficient if you work when you're at your best.

Create a dedicated study time

Set up a time devoted only to studying or homework. Shut off your phone and respond to calls or texts when your work is finished. Don't check email or surf the Web (except when you need to for the work you're doing) during this time either.

**Budget your time**

Figure out how much time you usually spend on your activities and then create a weekly schedule to follow. Determine how much free time you have before you add any commitments. And don't forget to schedule time to relax.

**Don’t get sidetracked**

If you find yourself wasting time on unimportant things, stop, check your to-do list and get back to what’s at the top. Maybe you’re procrastinating because you’re not sure how to move forward on a school project. If that’s the problem, check with your teacher to clear things up so you can get moving.

**Get a good night’s sleep**

Your brain needs rest to perform at its peak. If it’s time to sleep, list the things you still need to get done on the next day’s to-do list and go to bed.

**Compromise**

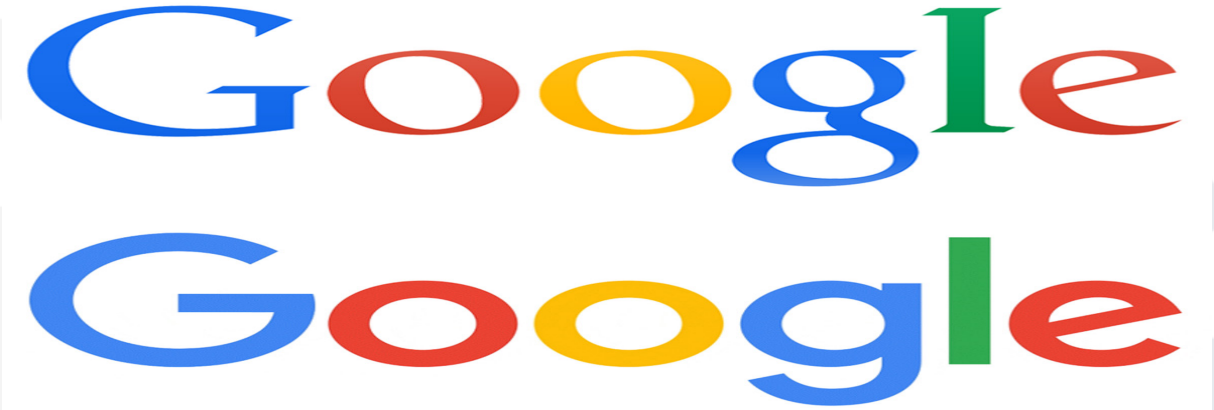
At times, there will not be enough time to get things done the way you want. When those times happen, trade in excellence for efficiency. Sometimes, good enough has to be good enough.

***Earning a college degree is a cumulative process. If you develop good time management habits early on – you’ll be able to reward yourself with a college degree sooner, rather than later.***

- Rashmi R. Maheshwari (ME)

# How Google controls the life of an average person

The internet is having a great social and economic impact in our society. The trends of gaining information had changed over last four decades. The rush of obtaining information and data had created an environment where individuals had dashed themselves to search engines like Google, Bing and Yahoo. But among these, Google is the most prominent search engine on the World Wide Web across all platforms with 92.62% market share, handling more than 5.4 billion searches each day. Undoubtedly Google has made everyone a smarter person but also has contributed in making us lethargic. Internet has altered our mental habits for sure. Most of the people have lost their ability to read and absorb anecdotes. The quick Google searches, links and hyperlinks have made our life sluggish.




The technology we thought we were using to make our life more efficient had now stared to reshape our social behavior and relationship. To understand this better check the number of times you go to Google for searching information and entertainment. We trust Google reviews more than our friends and relations. All our personal data is linked to our Google account which tracks our web activities to show relevant videos articles and music which might suit our interest. Google has all personal information about you. Google knows each and everything about you. Hence, it controls you without being seen by you. All the advertisement that pop up in when you are browsing Google is behind them. The sale promotional email you receive Google is behind them. Google always knows your exact location. Google knows when you do bank transactions. Google knows your phone bill payment schedule. Google knows how much traffic you will encounter while travelling to a place. So, you see how Google controls an average man or woman life! And only our overdependence for all types of services is the prominent reason that allows Google to control us.

- Priyanshu Giri (ME)

# Advanced Thermal Solutions in Microscale Geometries

One of the hallmarks in the technological developments occurring over the last two decades of the 20th century was there lent less effort of the scientific community toward miniaturization. This concentrated effort manifested in the development of miniaturized electronic circuits, integrated circuits, and microelectronic chips, thereby laying the cornerstone of a new technological field named, by the involved intelligentsia, microelectronics. With the passage of time, further miniaturization of electronic circuits as well as the development of more powerful electronic chips and other compact systems created a greater demand for developing efficient heat-removal techniques in order to accommodate the high heat fluxes generated in such microelectronic systems. One of the simplest arrangements that was commonly used to this effect involved the flow of a liquid through small straight circular tubes or rectangular channels fabricated on the circuit boards on which the chips were mounted. Characteristically, these channels had hydraulic diameters below300 μm and were referred to as micro channels. Hence, a point of time was reached when it was imperative for the concerned research community to develop a better understanding of the micro scale liquid flow and heat transfer characteristics in order to improve the efficiency of the microelectronic cooling systems.

With this motive, a series of experimental and theoretical studies was initiated in this line of research. By virtue of those investigations it was observed that at the microscale flow frictional and heat transfer behaviour differed significantly from the well established paradigms of macroscale theories. Another very intriguing revelation was the fact that in the realm of microscale flows, due to the enhanced surface-to-volume ratio, alterations in the solid–liquid interfacial conditions have pronounced effects on the bulk flow behaviour. These observations further instigated the concerned research community into designing more sophisticated investigative methods that aided not only in better comprehension of microscale mass and thermal transport processes, but also in developing new physical understanding of the solid–liquid interfacial condition. Hence, an important aspect of this field of research was the study of the effects of surface characteristics, and consequential interfacial conditions on the microscale flow and heat transfer behaviour. All these efforts culminated in broadening the horizon for the application of microscale transport processes. Under the present circumstances, these applications encompass not only the fields of microelectronics and microelectromechanical systems (MEMS), but also mini heaters and mini heat exchangers, aerospace, materials processing, thin film deposition technologies, micropumps, microvalves, and chemical separation processes. The application of microfluidics in the fields of bioengineering and biotechnology, especially in lab-on-a-chip or bio-chip systems for drug delivery and biomedical diagnosis also deserve special mention.

- Najeeb Ullah Khan (ME)

# Youth: The Strength of a Nation

Young age is that phase of life where dreams are built and a bright future is foreseen. It is the age of discovery, construct value system and begin an all new journey on the path of successful life. No doubt that Nation's strength is in its youth. Development of a strong nation demands on youth's will power.


The quality of its youth determines the kind of future, the nation will have. Therefore, if want to ensure a bright future for our country, we first need to strengthen and empower our youth. The youth of any nation and society are its potential energy who holds whole the system of a nation. We need to provide a good education system as well as makes them scientific, logical, open- minded, self-respecting, honest and patriotic, so that we could make a better tomorrow. Without these virtues being developed, our youth cannot walk in the desired way. Hence, naturally, it becomes the most important duty of students to be fully disciplined and avoid there rude behaviours. Their duty in the present is to prepare themselves for future. They should be well equipped morally, emotionally, mentally and physically. Youth is Nation's future, so they must be trained, disciplined and skilled.

- Naitik Pal (ME)

# SAPIENS

Hello my dear friends!

How many of you have listened the word “HOMOSAPIENS”.IF you have not then i will tell you -homosapiens is the species of HUMAN. yes! you read it correctly we are the species of HUMAN who has survived the mass extentiction and also every natural disaster .

We have found the evidences of 7 species of sapiens, there can be more than this. They are named as:-

1. Homoneanderthalensis
2. Homo eractus
3. Homo floresiensis
4. Homo habilis
5. Homo rudolfensis
6. Homo heidelbergensis
7. Homo sapiens

Our ancestor was Homosapiens .They were not strongest among them, they were not naturally adaptive as well. but they survived that age of extinction. Several researches show that they survived that because of their tendency in living in large colonies. They together hunt food and together they would come up with the climate change besides hunting, they discovered how to propagate certain plants and how to breed animals, which changed history forever. Soon they learned to produce more food, and ate a variety of animals and plants.

Their control over fire and their tendency to live in larger groups also led to the creation of better shelters. They keep on learning and evolving things around them, which evolved them as well lead to the modern human. Here we are after billion of years without knowing their efforts.

- Shikhar Verma (ME)

# One Life One Chance

Life is fast, there is no doubt about that. Everyone knows that we only have so many trips around the sun, but does everyone really make the most of the time they have? I think not, I think that in this day of age people are too per-occupied with material things. People forget to live outside of their comfort zone, they forget to enjoy the little things. They forget to taste the air, They trade in their Teenage dreams and promises for adult boredom and the mind set that they have to live quietly. Life inst quiet, life is loud and big and beautiful. People forget that, they forget how vibrant life is. They forget to make the most out of it. They forget that humans need to taste life, they need to see places, and do things others only dream of. They need to make memory's that will turn into story's. The kind of story's you can tell interesting people at 3 am, the kind of story's wide eyed children will listen intently too. The kind of story's that can live on even after their time around the sun is done. They have forgotten how to put everything they have into life. That's the sad truth, People honestly are just forgetting to live. They are doing what they said they never would. They are wasting themselves. Wasting their one chance at life, wasting their dreams, forgetting their promises.

We all only get one chance, let's not waste it.

- Kapil Kumar (ME)

# Smart Materials

Materials play a vital role in evolution of human civilization and industrial revolution. The demands from aerospace, defence, automotive and industrial branches on more advanced and innovative materials has led to the development of a new generation of materials with much better performance and capabilities than the existing conventional structural and functional materials. As a result, the era of smart materials has started.

Smart materials are materials which possess the ability to change their physical properties in a specific manner in response to specific stimulus input. The stimuli could be pressure, temperature, electric and magnetic fields, chemicals, hydrostatic pressure or nuclear radiation. The associated properties that could be changes may be viscosity, shape, stiffness, damping etc. Researcher Takagi explained it as intelligent materials that respond to environmental changes at the most optimum conditions and reveal their own functions according to the environment. Such structures are known as smart structure because of their self adaptability, memory, self sensing capacity, multiple functionality. These properties provide numerous applications in defence, aerospace engineering, biomechanics, civil engineering structures etc.

Smart materials are broadly classified as Active and the Passive material based upon its transuding capacity. Active smart materials as those materials which possess the capacity to modify their geometric or material properties under the application of electric, thermal or magnetic fields, thereby acquiring an inherent capacity to transduce energy. Piezoelectric materials, SMAs, ER fluids and magneto-strictive materials are considered to be the active smart materials and therefore, they can be used as force transducers and actuators. While the materials, which are not active, are called passive smart materials. Although smart, they lack the inherent capability to transduce energy. Fiber optic material is a good example of a passive smart material.

**Different types of smart materials are:**

Piezoelectrics: Piezoelectric materials convert electrical energy to mechanical energy, and vice versa. They offer a wide range of utility and can be used as sensors, such as many accelerometers, and energy harvesters since the charge generated from motion can be harvested and stored. Common applications for piezo materials are BBQ igniters and actuators for inkjet printer heads.

**Shape Memory Alloys:** The most commonly available Shape Memory Alloy is Nitinol, which was originally developed by the Naval Ordinance Laboratory. SMA's have the ability to change phase as a function of temperature, and in that process generate a force or motion. They are capable of relatively high energy but move slowly.

**Magnetostrictive:** Similar to piezoelectric materials that respond to changes in electrical fields, this class of materials responds to changes in magnetic fields and can perform as an actuator, or sensor if deformed. While they can work well, they exhibit a large hysteresis which must be compensated when using the material in sensor applications.

**Shape Memory Polymers:** Shape Memory Polymers (SMP) are similar to Shape Memory Alloys except the obvious fact they are made from a polymer matrix. They possess much greater recoverable strains than the alloys, but typically under lower forces.

**Hydrogels:** Hydrogels can be tailored to absorb and hold water, or other liquids, under certain environmental conditions. Hydrogels have been around for a long time, specifically in disposable diapers. A key feature however is the gels can be tailored chemically to respond to different stimuli.

**Electroactive Polymers:** There are many forms of electroactive polymers and many are still being refined. They have great potential as the flexibility of how they can be used provide advantages over some of the metals and ceramics mentioned above.

**Bi-Component Fibers:** Adaptive thermal insulation can enable smart clothing that can change its thermal properties based on the environment.

- Rashmi R. Maheshwari (ME)

# Unemployment in India: Causes and Consequences

One of the major hindrances in the growth of any country is unemployment. Unemployment is a serious issue in India. Lack of education, lack of employment opportunities and performance issues are some of the factors that lead to unemployment. The government of India must take effective steps to eliminate this problem.

One of the main problems faced by the developing countries is unemployment. It is not only one of the major obstacles in the country's economic growth but also has several other negative repercussions on the individual as well as the society as a whole. Here are some essays of varied length on the issue of unemployment in our country.

People who are willing to work and are earnestly looking for job but are unable to find one are said to be unemployed. It does not include people who are voluntarily unemployed as well as those who are unable to seek job due to certain physical or mental health problem.

There are various factors that lead to the problem of unemployment in the country. These include:

- Slow Industrial Growth
- Rapid Increase in Population
- Focus on Theoretical Education
- Fall in Cottage Industries
- Lack of alternative employment opportunities for the agricultural workers
- Technological Advancement

Unemployment does not impact only the individuals but also the growth of the country. It has a negative impact on social and economic growth of the country. Here are some of the consequences of unemployment:

- Increase in crime rate
- Poor standard of living
- Loss of skill
- Political instability
- Mental health issues
- Slow economic growth

Surprisingly, despite the negative repercussions it has on the society, unemployment is one of the most overlooked issues in India. The government has taken certain steps to control the problem; however, these have not been effective enough. The government should not just initiate programs to control this problem but also keep a check on their effectiveness and revise them if need be.


62
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62
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