# MECHXTREME


Department of Mechanical Engineering

Government Polytechnic,
Lakhisarai

# Vission & Mission of the Department

## Vision

To be known as premier department of Mechanical Engineering in technical education and application of knowledge & skills to the benefits of the society.

## Mission

M1- To develop state-of-the art teaching learning facilities to interpret, apply, disseminate and create knowledge.

M2- To be dynamic, innovative and flexible in devising programs, structures and mechanisms to cope with the changes.

M3- To equip the students with academic, corporate and entrepreneurial leadership, communication skills and global awareness requured by the engineering profession and society in general.

M4- To establish an environment that encourages and builds an exemplary degree of citizenship, professional integrity with ethical behaviour.

# Message from Principal

**As principal, I'm thrilled to welcome you to this edition of the Mechanical Engineering Magazine, a platform dedicated to showcasing the ingenuity and innovation of our field. This magazine is a testament to the power of mechanical engineering to shape our world.**

**The mission of our magazine is to foster an environment of knowledge sharing and community engagement, and we are committed to showcasing the work that elevates mechanical engineering to new heights.**

**As the principal, I commend all the students, faculty, and staff who have contributed to this publication. Your efforts are a testament to the ongoing dedication to excellence and to the pursuit of knowledge in the field.**

**We are excited to see how the ideas presented in this magazine can inspire the next generation of engineers and shape the future of technology.**

**Sincerely,**
**Dr R K Ranjan**
**Principal**
**Government Polytechnic, Lakhisarai**

# Message by
## Head Of Department

Dear Students, Faculty, and Readers,

It is my privilege to address you through this edition of our magazine, dedicated to the ever-evolving field of Mechanical Engineering. Diploma education serves as a crucial stepping stone for young minds aspiring to build a career in this dynamic industry. As the Head of the Department, I take immense pride in witnessing the passion and curiosity with which our students engage in learning, innovation, and hands-on application of engineering principles.

Sincerely,
Suraj Kumar
Dept. Of Mechanical Engg.

# Message from Faculty

Dear Students,

As your teacher, we want to encourage you to make the most of your time at this technical institute by staying curious, working hard, and embracing every learning opportunity. The skills and knowledge you are gaining here will lay the foundation for your future careers, so give your best in every project, class, and challenge. Remember, success is not just about talent, but also about persistence, discipline, and a willingness to learn from mistakes. Stay focused, support one another, and never stop striving for excellence.

Sincerely,
Dr. Pankaj Kumar Baitha
Dept. Of Allied Science

# Message from Faculty

प्रिय विद्यार्थियों,

जीवन एक यात्रा है, जिसमें हर दिन कुछ नया सीखने और बेहतर बनने का अवसर छुपा होता है। आपके पास ज्ञान अर्जित करने, अपने सपनों को आकार देने और समाज में सकारात्मक बदलाव लाने की अपार क्षमता है।

परिश्रम, अनुशासन और ईमानदारी—यही आपकी सबसे बड़ी पूंजी हैं। चुनौतियाँ आएंगी, लेकिन वही व्यक्ति सफल होता है जो उनसे सीखकर आगे बढ़ता है। हमेशा याद रखें, सफलता कोई मंज़िल नहीं, बल्कि निरंतर प्रयासों की प्रक्रिया है।

अपनी क्षमताओं पर विश्वास रखें, बड़े सपने देखें और उन्हें साकार करने के लिए पूरे मन से प्रयास करें। आप सभी में उज्ज्वल भविष्य की चमक छुपी है—बस जरूरत है उसे पहचानने और निखारने की।

आपका भविष्य आप ही के हाथों में है—उसे सुनहरा बनाइए।

सप्रेम,
राकेश रंजन

# FACULTY

Suraj Kumar

Subhash Kumar

Amit Ranjan

Anuj Kumar

Simran Bharati

Sakshi Sinha

Department of Mechanical Engineering

# LAB ASSISTANT

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# INSTRUCTORS

Bipin Singh
Fitting Shop

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Chandan Kumar Ray
Sheet Metal Shop

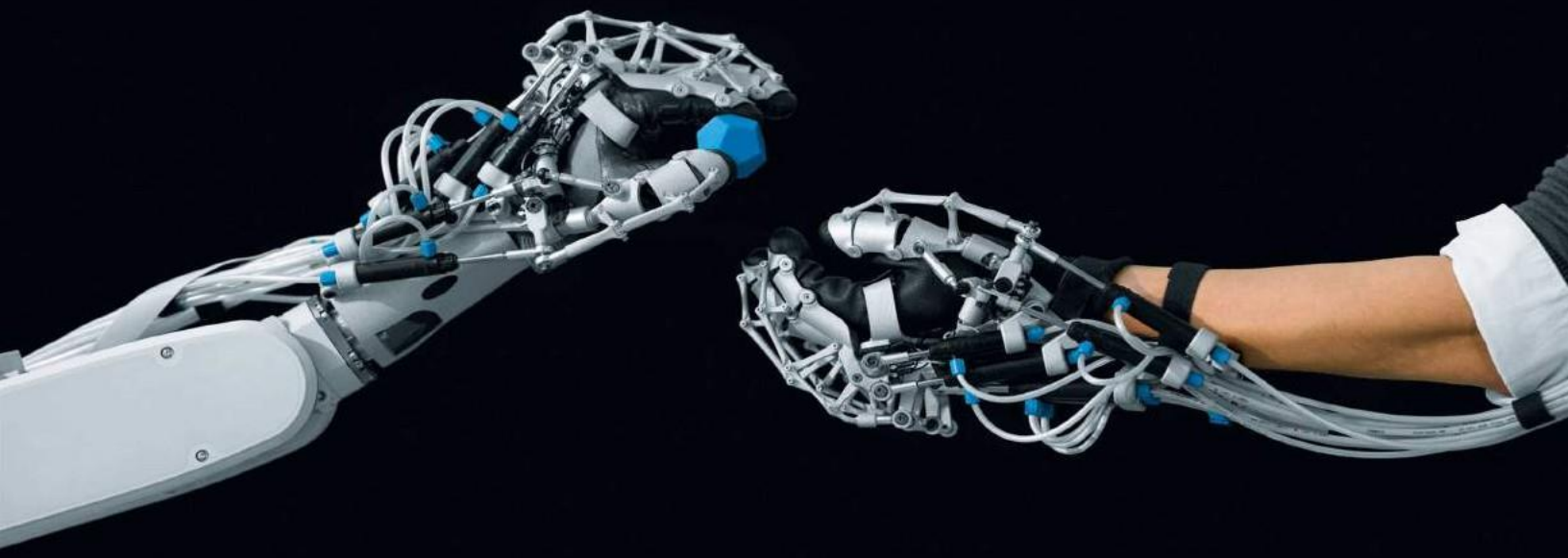
Amit Pratap
Machinist

Shashant Kumar
Welding Shop

Sidhandh Anand
Carpentary Shop

## Department of Mechanical Engineering

# Faculty Articles



# Traditional Knowledge in India

*Presented by*
**Dr R K Ranjan**

"Whenever an old man dies, it's a library burning down"

— Amadou Hampâté Bâ

(Malian writer, historian and ethnologist)

**Introduction**

Ideas and inventions have been passed down from generation to generation within many communities since time immemorial. Today's practice can be defined as a collective

understanding of all inventions and developments that occurred over time and were then passed down as Traditional Knowledge (TK).

Long before the development of modern science, which is quite young, indigenous people have developed their ways of knowing how to survive and also ideas about meanings, purposes and values. It has become customary to refer to this kind of knowledge as "indigenous knowledge" or "traditional knowledge".

What makes knowledge "traditional" is not its antiquity: much TK is not ancient or inert but is a vital, dynamic part of the contemporary lives of many communities today. TK is being created every day and evolves as individuals and communities respond to the challenges posed by their social environment.

**What is Traditional Knowledge?**

According to WIPO, "Traditional knowledge (TK) is knowledge, know-how, skills and practices that are developed, sustained and passed on from generation to generation within a community, often forming part of its cultural or spiritual identity". WIPO currently uses the term "traditional knowledge" to refer to tradition-based literary, artistic or scientific works; performances; inventions; scientific discoveries; designs; marks, names and symbols; undisclosed information; and all other tradition-based innovations and creations resulting from intellectual activity in the industrial, scientific, literary or artistic fields.

The information, capabilities and customs that local groups and indigenous people have gathered over many generations and that are frequently rooted in their surroundings are referred to as traditional knowledge (TK). Among the practices are folklore, handicrafts, medicine and agriculture. In India, traditional knowledge is an essential component of cultural identity and not just a way of life.

**Traditional Medicine**

Among India's most well-known traditional knowledge are its age-old medical systems, including Siddha and Ayurveda. Ayurveda,

literally translates to the science of life and has

been practiced for more than 5,000 years. It is grounded on striking a balance between the body, the mind and the spirit. It emphasizes the importance of food, herbs and lifestyle modifications for maintaining a good health.

The core values of Ayurveda are found in ancient texts like the Vedas and the Charaka Samhita. They describe herbs, their medicinal properties, recommended treatment protocols, and the overall holistic approach to health. Like Ayurveda, Siddha medicine is also primarily practiced in Tamil Nadu, but there are several elements that are particular to Siddha.

Recently, there is revived interest in these ancient systems both in India and outside. Traditional medicine has a role to play, and WHO has accepted the same, and it has been leading efforts in India through research and development initiatives to promote Ayurveda.

**Agricultural Practices**

Traditional knowledge systems based on sustainability and biodiversity form the foundation of agricultural practices in India. Indigenous farmers can cultivate many different crops using techniques that are specific to local climates and available soils. Practices such as intercropping, crop rotation and organic fertilization helps to improve soil fertility and reduces threats from pests and diseases.

It is impossible to overstate the importance of traditional seed varieties. Indian farmers have successfully preserved thousands of these seed variants, which have been shown to be resistant to pests and climate change. They play a crucial role in preserving biodiversity and ensuring food security. Because traditional agricultural methods offer sustainable alternatives to industrial agriculture based on chemicals, there is a growing push to revive them.


In addition, traditional knowledge also comprises vibrant traditions of South Asian antiquity, especially the strong artistic traditions of India. Each region has its unique forms of art and craft, ranging from the elaborate motifs on Madhubani paintings to fine handwoven textiles of Varanasi. They have cultural significance and are more than just visuals, they frequently convey tales, customs and beliefs that form the foundation of identity of a community.

Indian crafts encompass an extensive range of abilities, such as woodworking, weaving, ironworking and pottery. Such traditional skills are preserved when artisans pass down their techniques and designs through generations. But since modern manufacturing processes and globalization kicked in, a lot of artisans find it difficult to keep up with their crafts. These traditional arts are not only seen as culture-rooted royalties but are endeavored to be promoted through livelihood aspirations.

**Spiritual Practices and Folk Traditions**

Holistic traditional knowledge in India Traditional knowledge in India is also closely linked with spirituality and religious practices. The community has its own beliefs and values which can be seen through a lot of rituals, festivals, and ceremonies.

For instance, worship of nature like the River Ganges or holy forests shows the indigenous knowledge of ecology and oneness of life.

The traditions of

storytelling, dance and music are used to save history and teach moral values. They frequently impart morals about living in unison with the great outdoors, living together and continuing through ordeal. However, many of these traditions are vulnerable to disappearance in urbanizing contexts, making it crucial to document and rejuvenate them.

**Challenges to Traditional Knowledge**

India has a wealth of traditional knowledge, though it is often beleaguered by a variety of challenges. However, massive globalization and industrialization have caused numerous indigenous practices to disappear because children are moving into big cities for promising opportunities. The homogenization of culture causes challenge that threatens diversity of traditional knowledge and needs to have an innovative solution to preserve such practice.

Furthermore, Intellectual Property Rights (IPRs) issues are a serious challenge to traditional knowledge. A lot of indigenous communities just have their knowledge stolen, without credit or compensation. It is also important to create laws that help these communities profit off of their heritage by protecting this knowledge about natural resources.

Sharing Traditional Knowledge project points out, Indigenous peoples, past generations and the people today hold the key for preserving traditional knowledge methods, therefore it is a collective responsibility but it can easily be passed from generation to generation.

**Preserving Traditional Knowledge**

Preserving and promoting traditional knowledge requires a collective effort from the government, the local communities, non-governmental organizations (NGOs) and educational institutions. The Indian government has taken several initiatives to acknowledge and safeguard traditional knowledge, such as the Traditional Knowledge Digital Library (TKDL), which seeks to document and protect traditional knowledge of India.

Addressing the need to preserve traditional knowledge is also an important aspect of raising awareness. It can help instil pride in cultural heritage through programs that incorporate traditional practices and teachings. Local initiatives related to traditional crafts, local agriculture, herbal/folk medicine and others as such are driven and minimizing the threat to livelihoods in those local populations while keeping a traditional knowledge system intact.


# Opportunity in Mechanical Engineering

Prof.(Dr.) Chandan Kumar, DCE Darbhanga

**Introduction:**

Mechanical Engineering is called Ever Green Branch. It refers that, since inception of this branch, excellent employability opportunity is always available for Mechanical Engineers. In recent years due to rapid development of computers and Automation of Machines, it has been observed that there is decline in the core nature of job. People assumes that demand of Mechanical Professionals has decreased. But it is myth. In fact demand of skilled Mechanical Engineer is still in good number. Only thing is one has to be skilled in latest tools and technology as per industrial demand. Few skills set are mentioned below

***Technical Skills*:**

Today industry wants one or more technical skill sets in a Mechanical Engineer at the time of recruitment.

- Proficiency in CAD software (e.g., CREO, Solid Works, AutoCAD).
- Knowledge of Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD).
- Knowledge of Modern Manufacturing Processes (e.g., CNC machining, 3D printing).
- Knowledge of Robotics, Drone.
- Competency in Mechatronics ( Microcontroller Programming)
- Knowledge of Automation (Sensors , IOT, DAQ etc)
- Familiarity with programming languages (e.g., Python, MATLAB).

***Soft Skills:*** Few must have soft skill sets are listed here

- Communication
- Problem-solving and
- Critical thinking.
- Teamwork.
- Project management and leadership.

***Career Opportunities*:** The different area/industries where one can grab Job/start business or go for higher study are as below.

**Area where one may seek employment**

Power generation: Thermal/ Hydro/Nuclear Power plant
Minning industries
Automotive: Designing vehicles, engines, and systems.
Aerospace: Developing aircraft, spacecraft, and propulsion systems.
Product development: Design, Reverse engineering, prototyping. Testing etc
Manufacturing: Manufacturing of products, Quality control, maintenance
Biomechanics: Developing medical devices and prosthetics.
Energy: Working on renewable energy systems, oil and gas, or Biodiesel.
Robotics and Automation: Designing robots and automated systems.
Consulting: Providing expert advice on engineering projects.

## Various Industries related to Mechanical Engineering Domain

| Types | Company | Remarks |
|---|---|---|
| **Govt.** | Jobs through Public service commission | Competitive examination |
| **PSU** | SAIL, BHEL,GAIL,NTPC, HURL,HP NHPC,EIL,CIL,HEC,IOCL,ONGC,BPCL,HAL | GATE/TEST |
| **Private** | **Indian-**TATA Group, Reliance ACC, Ashok Leyland, Adani Group, Vedanta,Jindal, Praj India, Bajaj industries<br>**Multinational:** Automotive (e.g., Tesla, Ford, Toyota) Aerospace (e.g., Boeing, SpaceX, Airbus),- Energy (e.g., Siemens, GE Renewable Energy),- Manufacturing (e.g., General Electric, Caterpillar), Robotics (e.g., Boston Dynamics, ABB)<br>Construction and Infrastructure (L&T),<br>Cnsumer Electronics (e.g., Apple, Samsung,LG) | Campus/TEST /Interview |

## Other field

Software industries like TCS/Infosis/Wipro/IBM and other also recruits the Mechanical Engineer. A mechanical engineer with good mathematical knowledge and logic having knowledge of computer language/AI/ML knowledge

Students interested in teaching/ research may appear in GATE examination and may go for Post graduate courses from IIT, IISc, NIT etc. They may join PhD programme after completing PG. A Ph.d holder may go for teaching or R&D in India as well as abroad.

## Emerging Trends

Green Energy:

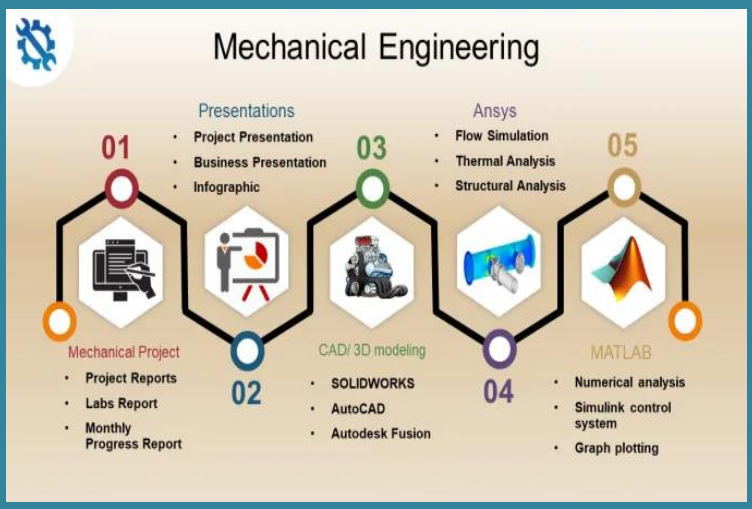
Additive Manufacturing:

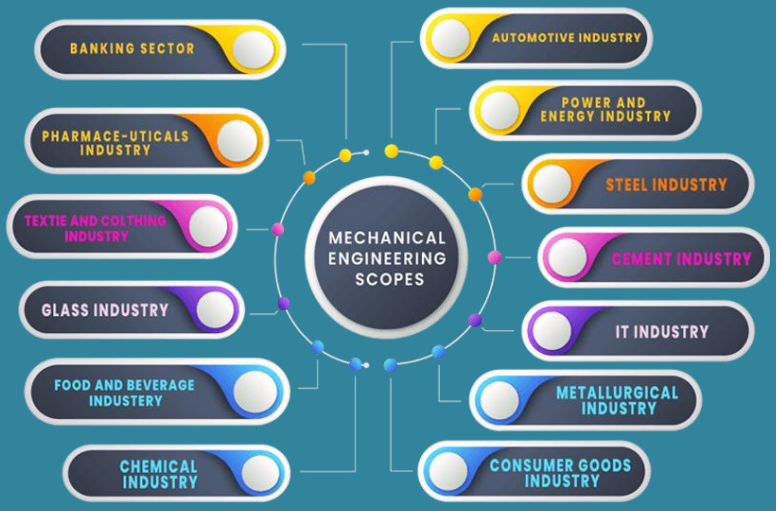
Smart Manufacturing:

Electric Vehicles (EVs):

Robotics and AI:

**Conclusion:** A career in Mechanical Engineering offers endless possibilities for innovation and impact. With the right education, skills, and mindset, you can build a fulfilling and successful career in this dynamic field.



# Exploring Singular Perturbation Problems: Unraveling the Complexity

By
Dr. Rakesh Ranjan (Mathematics Faculty)

**Introduction:** In the realm of mathematics and engineering, singular perturbation problems stand as intriguing challenges that often arise when dealing with systems exhibiting multiple scales of behavior. These problems manifest across various disciplines, from physics to biology, and their understanding is crucial for unraveling the intricate dynamics governing real-world phenomena. In this article, we embark on a journey to explore the essence of singular perturbation problems, delving into their significance, mathematical foundations, and practical applications.

**Understanding Singular Perturbation:** At its core, a singular perturbation arises when a system's behavior is characterized by different timescales, leading to the emergence of fast and slow dynamics. Consider a dynamical system described by a set of differential equations. In singularly perturbed systems, certain terms in these equations dominate over others depending on the timescale under consideration. This disparity in timescales gives rise to challenges in analyzing the system's behavior, as traditional methods may fail to capture the full dynamics accurately.

**Mathematical Formulation:** Mathematically, singular perturbation problems are often characterized by dimensionless parameters that govern the relative importance of different terms in the system's equations. These parameters serve as a bridge between the fast and slow dynamics, allowing for the formulation of asymptotic expansions and perturbation techniques to analyze the system's behavior. Perturbation methods such as the method of matched asymptotic expansions, multiple scales analysis, and boundary layer theory play a pivotal role in tackling singular perturbation problems, enabling researchers to obtain accurate approximations and insights into the system's behavior.

**Challenges and Techniques:** One of the key challenges in dealing with singular perturbation problems lies in reconciling the disparate timescales to obtain a comprehensive understanding of the system's behavior. This often involves identifying the regions where certain dynamics dominate and employing appropriate mathematical techniques to analyze each regime separately. For instance, in systems exhibiting boundary layers, where rapid transitions occur in localized regions, boundary layer theory provides a powerful framework for capturing the dynamics near these boundaries while preserving accuracy in the rest of the domain.

**Applications Across Disciplines:** The ubiquity of singular perturbation problems across various disciplines underscores their significance in understanding real-world phenomena. In physics, these problems arise in the study of fluid dynamics, quantum mechanics, and electrodynamics, where

multiscale phenomena dictate the system's behavior. Similarly, in biology, singular perturbation techniques find applications in modeling biological processes such as gene regulation, neuronal dynamics, and ecological systems, where the interaction of fast and slow processes shapes the overall behavior of the system.

**Practical Implications:** The insights gained from studying singular perturbation problems have far-reaching practical implications in engineering and technology. For instance, in control theory, understanding the dynamics of singularly perturbed systems is essential for designing robust control strategies that can effectively regulate systems with disparate timescales. Similarly, in the design of electronic circuits and communication systems, accounting for singular perturbations is crucial for ensuring the stability and performance of the designed systems in the presence of noise and disturbances.

**Future Directions and Conclusion:** As we continue to delve deeper into the realm of singular perturbation problems, numerous avenues for future research emerge. From refining existing mathematical techniques to developing new approaches for tackling increasingly complex systems, the journey towards unraveling the intricacies of singular perturbation promises to be both challenging and rewarding. By harnessing the power of mathematics and computational methods, we can unlock new insights into the dynamics of multiscale systems, paving the way for innovative solutions to real-world problems.
In conclusion, singular perturbation problems represent a fascinating frontier in mathematics and engineering, offering a glimpse into the rich interplay of dynamics across multiple scales. Through rigorous analysis, creative problem-solving, and interdisciplinary collaboration, we can unlock the secrets hidden within these complex systems, ushering in a new era of understanding and innovation.

**Achievements:-**

Dr. Rakesh Ranjan received his Five years Integrated M.Sc. in Applied Mathematics from Central University of Jharkhand, Ranchi, India and Ph.D. in Mathematics from National Institute of Technology Jamshedpur, India. He holds CSIR NET and Gate certificates. Currently, he is working at Government Polytechnic Lakhisarai, DSTTE Bihar as a lecturer since 2018. His research interests span the areas of numerical solution of differential equations, focusing on singularly perturbed problems. He has published more than 20 research articles in reputable journals. He also made numerous contributions in serving as a reviewer. His research interests include Numerical Analysis, Integral equations and Fractional Calculus and Mathematical Modeling. He has organized Mathematics Day, Science Day etc. He has completed many FDP Courses.

# Shining a Light on the Future: Exploring the Frontiers of Photoluminescence Research

by Dr. Pankaj Kumar Baitha

Photoluminescence occurs when a material absorbs photons of higher energy and subsequently emits photons of lower energy. This process can be attributed to various mechanisms, including fluorescence, phosphorescence, and upconversion luminescence. Understanding these mechanisms at the molecular level is crucial for designing and engineering materials with tailored photoluminescent properties.

In recent years, photoluminescent materials have garnered significant attention in the field of materials science. Quantum dots, semiconductor nanocrystals with unique size-dependent optical properties, have emerged as promising candidates for applications in displays, lighting, and biomedical imaging. Researchers are exploring novel synthesis methods and surface engineering strategies to enhance the stability, brightness, and color purity of quantum dot-based luminescent materials.

Perovskite materials, a class of hybrid organic-inorganic compounds, have also attracted widespread interest due to their exceptional photoluminescent properties and potential applications in solar cells, light-emitting diodes (LEDs), and photodetectors. Ongoing research efforts focus on improving the stability, efficiency, and scalability of perovskite-based photoluminescent devices through compositional engineering, interface optimization, and device architecture design.

Photoluminescence plays a vital role in biomedical research and healthcare applications. Fluorescent probes, capable of emitting light upon excitation, enable non-invasive imaging and tracking of biological processes at the cellular and molecular level. These probes have revolutionized biomedical research by providing valuable insights into disease mechanisms, drug interactions, and cellular dynamics.

In addition to traditional fluorophores, researchers are exploring advanced photoluminescent materials, such as carbon dots, upconversion nanoparticles, and quantum rods, for biomedical imaging, biosensing, and drug delivery applications. These materials offer distinct advantages, including superior photostability, biocompatibility, and multiplexing capabilities, making them valuable tools for studying complex biological systems and developing next-generation diagnostic and therapeutic technologies.

Photoluminescent sensors and probes are increasingly being utilized for environmental monitoring and sensing applications. These sensors offer rapid, sensitive, and selective detection of various environmental pollutants, including heavy metals, organic pollutants, and toxic gases. By harnessing the photoluminescent properties of functional materials, researchers aim to develop

cost-effective, portable, and real-time monitoring devices for assessing air and water quality, monitoring industrial emissions, and mitigating environmental pollution.

As photoluminescence research continues to evolve, several emerging trends and future directions are shaping the field. Persistent luminescent materials, capable of emitting light long after the excitation source is removed, hold promise for applications in security labeling, biomedical imaging, and renewable energy storage. Time-resolved luminescence spectroscopy techniques, such as time-correlated single photon counting and fluorescence lifetime imaging microscopy, enable researchers to study dynamic processes with high temporal resolution, offering new insights into photophysical phenomena and material behavior.

Interdisciplinary collaborations between scientists, engineers, and industry stakeholders are driving innovation and accelerating the translation of fundamental discoveries into practical applications. By leveraging advances in nanotechnology, materials science, and spectroscopic techniques, researchers are poised to unlock the full potential of photoluminescent materials and technologies, addressing global challenges in energy, healthcare, and the environment.

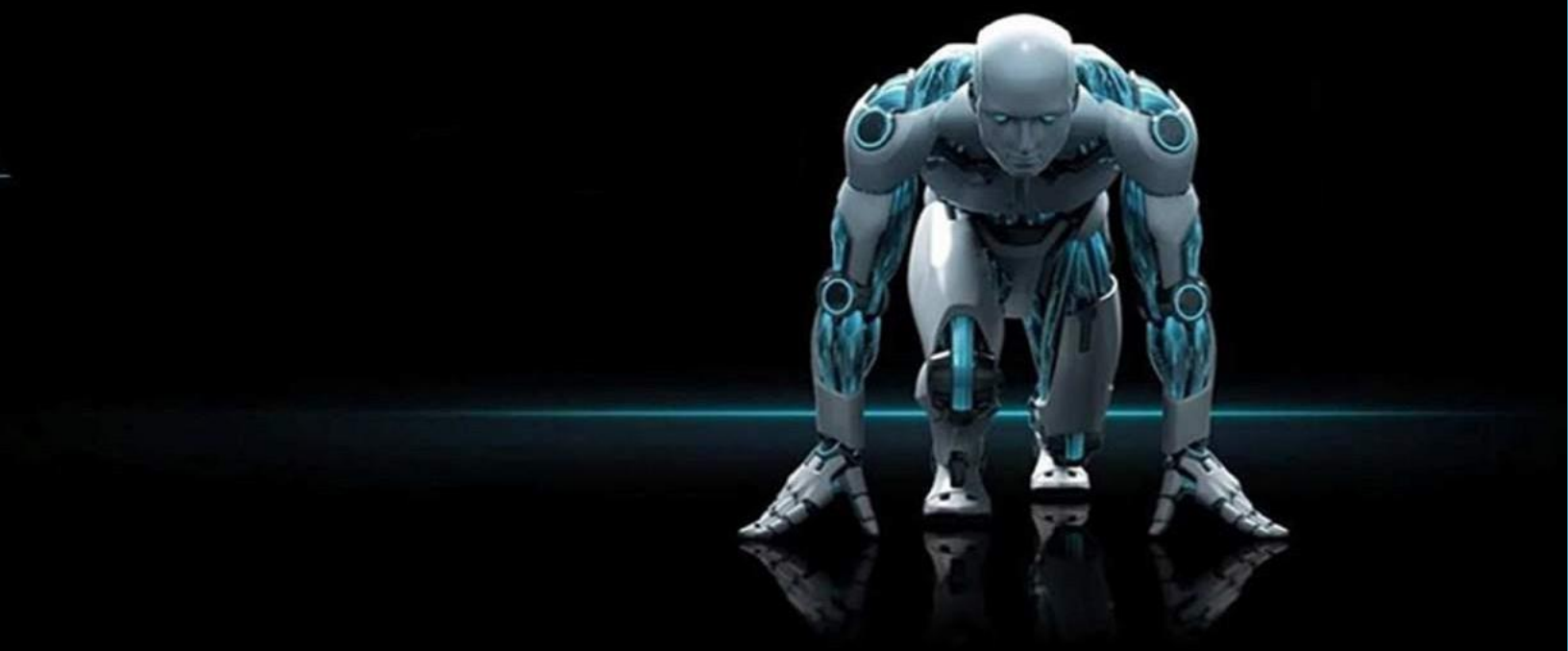
The field of photoluminescence research holds tremendous promise for addressing key societal challenges and driving technological innovation. By harnessing the unique properties of photoluminescent materials, researchers are paving the way for advancements in energy efficiency, biomedical imaging, environmental monitoring, and beyond. As we continue to unravel the mysteries of light and explore new frontiers in photoluminescence research, the future shines brightly with possibilities.

Achievements:-

Dr. Pankaj Kumar Baitha received his PhD from Indian Institute of Technology (Indian School of Mines), Dhanbad and M.Sc. in Applied Physics from Indian School of Mines, Dhanbad, India. Currently, he is working at Government Polytechnic Lakhisarai, DSTTE Bihar as a lecturer since 2018. His area of interests includes structural and optical specially luminescence properties of materials. He has published more than 10 research articles in reputable internationals journals and conferences. He has attended many FDP programmes organised by different institution.

# LAB OF DEPARTMENT OF MECHANICAL ENIGINEERING

# Student Articles



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# Effect of Hot summer on Animals

By Anuradha Kumari & Rakhi Kumari

**Introduction:**

As the environmental temperature increases, the reliance on evaporative cooling (sweating and Panting) to dissipate body heat increases.

Lactating buffaloes and cows create a large quantity of metabolic heat and accumulate additional heat from radiant energy. Buffaloes tend to be more uncomfortable because they have fewer sweat glands under the skin than cows.

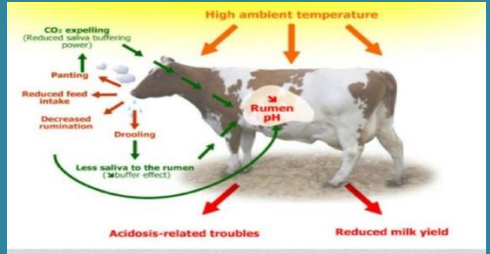

## Direct Impact of Heat stress and its Signs

High heat loads in diary animals may lead to

- Depressed feed intake
- Decreased milk yield
- Milk facts and protein percentage
- Weight loss and reduced reproduction.

## Caring for animals during extreme heat

- The provision of a plentiful supply of clean, cool water and shade is essential.
- The location of water should be familiar to animals days **before** extreme heat arrives. Animals should not have to walk too far for water.
- Animals need to be provided with shelter during extended periods of extreme temperatures. Shelter is especially important for very young or old animals or animals that are in poor condition or sick.

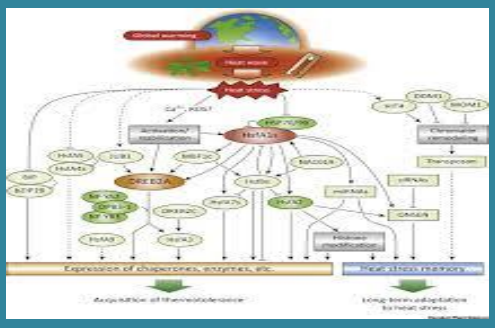



Heat stress, with its physiological and behavioral consequences, increases the risks of rumen acidosis.

http://www.thecattlesite.com/articles/1053/heat-stress-in-dairy-cows-implications-and-nutritional-management

# Effect of Hot Summer

- Heat tolerance
- Animals at high risk of heat stress include: young animals dark coloured animals that have been sick or have a previous history of respiratory disease.



## Heat stress tolerances can also vary between and within a species

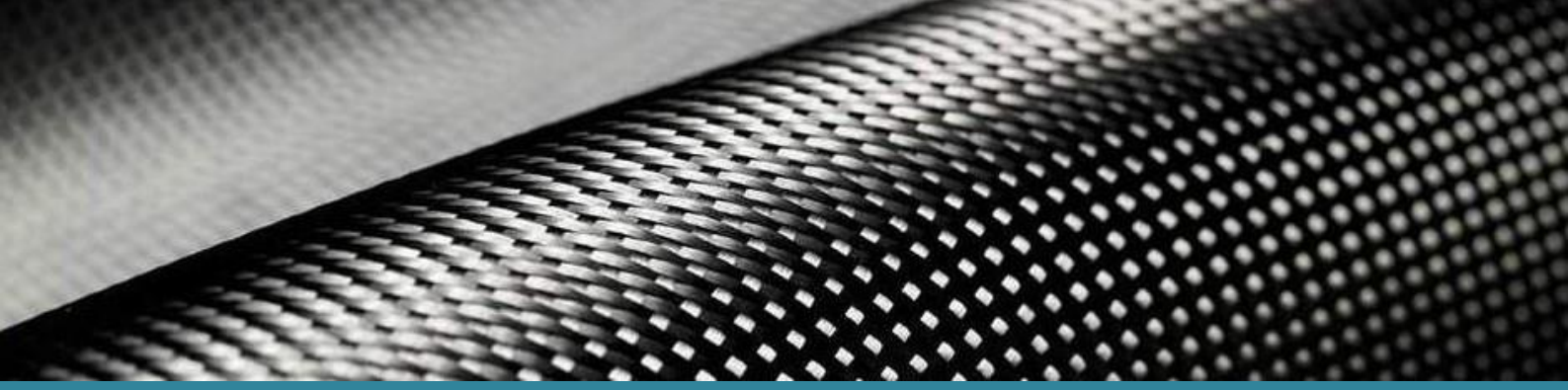
- pigs become heat stressed at a lower temperature level and are very prone to sunburn
- sheep that are newly shorn are at risk of sunburn
- high producing dairy cows are more effected by extreme heat than lower producing cows
- lactating cattle are more susceptible than dry cows because of the additional metabolic heat generated during lactation
- beef cattle with black hair suffer more from direct solar radiation than those with lighter hair, although those with pink skin are at risk of sunburn
- Holsteins are less tolerant than Jersey cows
- British breeds of sheep and cattle are less tolerant than merino or tropical beef breeds
- heavy cattle over 450 kg are more susceptible than lighter ones
- cattle, alpacas and llamas are more prone to heat stress than sheep and goats.

## Treating heat stress

- If your animals are showing signs of heat stress the following actions can be taken to cool them down:
- move them to the shade immediately, preferably somewhere with a breeze. If animals are too stressed to move, pick them up and move them or provide shade where they are
- offer plenty of cool clean water, but encourage them to drink small amounts often spray them with cool water, especially on the legs and feet, or stand them in water. Use sprinklers or hoses for cattle, pigs and horses. Lay wet towels over them. Dogs and cats can be placed in buckets/troughs of cool water. Poultry should not be wet down unless there is a breeze to aid the cooling process
- increase air movement around them. This can be done with fans, ventilation, or wind movement
- decrease stocking rates to allow animals room to lie down
- if the animal shows no sign of improvement contact your local veterinarian for assistance.







Not only has this structure improved the aircraft's performance (weight), but also its maintenance and repair procedures. It has been designed to fulfil in-service requirements with benefits such as increased resistance to accidental ground service impacts, simplified damage assessment processes and proven repair solutions.

Advantages of using composite is that they can be formed into more complex shapes then their metallic counterparts, weight reduction, formability, better corrosion resistance and good resistance to fatigue.

The B2 stealth bomber requires a radar-absorbing material to be added to the exterior of the aircraft with a concomitant weight penalty.

Composite materials are therefore used in the primary structure to offset this penalty.

The strength and stiffness of a composite buildup depends on the orientation sequence of the plies. The practical range of strength and stiffness of carbon fiber extends from values as low as those provided by fiberglass to as high as those provided by titanium. This range of values is determined by the orientation of the plies to the applied load. Proper selection of ply orientation in advanced composite materials is necessary to provide a structurally efficient design. The part might require 0° plies to react to axial loads, ±45° plies to react to shear loads, and 90° plies to react to side loads. Because the strength design requirements are a function of the applied load direction, ply orientation and ply sequence have to be correct. It is critical during a repair to replace each damaged ply with a ply of the same material and ply orientation. This is makes carbon fiber quasi-isotropic in nature.


# Student's Corner


मैं अंगद कुमार, 10वी की पढ़ाई पीo वीo हाई स्कूल लखीसराय से पूरी करने के पश्चात् राजकीय पॉलिटेक्निक लखीसराय से यांत्रिकी अभियंत्रण में डिप्लोमा कर अभी मैं दरभंगा अभियंत्रण महाविद्यालय, दरभंगा से बी टेक का पढ़ाई कर रहा हूँ।

मेरा बचपन से ही एक सपना था कि मैं इंजीनियर बन देश की सेवा और विकाश में अपना योगदान कर अपने गॉव और परिवार का नाम रौशन करूँ। इसके लिए मैंने राजकीय पॉलिटेक्निक लखीसराय में विधिवत नामांकन करा पढ़ाई शुरू की। हिन्दी माध्यम का छात्र था पर यहाँ सारे क्लास अंग्रेजी माध्यम में होने से मुझें शुरू में काफी दिक़्क़त हुई।देखते देखते प्रथम सेमेस्टर का परीक्षा आ गया जिसे मैंने हिन्दी माध्यम से दिया पर अंक बहुत कम आए।

फिर मैंने सभी शिक्षकगण से अपनी समस्या साझा किया। सभी ने मेरा मार्गदर्शन करने के साथ साथ उत्साहवर्धन भी किया। परंतु तत्कालिन विभागाध्यक्ष प्रो सुरज सर ने मुझे अपने जीवन से जुड़ी कहानी सुना और उनके कुछ टिप्स ने मेरे जीवन में बड़ा बदलाव ला दिया।

यहाँ इस बात की ज़िक्र करना बहुत महत्वपूर्ण है कि हम बहुत भाग्यशाली थे कि हमें प्राचार्य के रूप में डॉ आर के रंजन सर मिले जिनकी नई सोच, अदभुत् ऊर्जा तकनीक में महारथ ने न केवल मेरा वरन् संस्थान के समस्त छात्रों का सर्वांगीण विकास किया। सर, ख़ुद से करके सीखने पर बल देते थें। मैं अपने शैक्षणिक सत्र में सभी प्रकार के कार्यक्रम में बढ़ चढ़कर भाग लेता था जिसका परिणाम मेरा भारत स्काउट एंड गाइड में डिस्ट्रिक्ट कमांडर के पद पर चयन के रूप में परिणत हुआ और एक लंबे समय तक सेवा देने का कार्य किया, जहां से मेरा आत्मविश्वास बढ़ता गया और मैं बिहार सरकार के द्वारा आयोजित बहु आपदा जोखिम न्यूनीकरण प्रशिक्षण शिविर में पूरे बिहार में प्रथम स्थान प्राप्त किया जिसके परिणाम स्वरूप बिहार के मुखमंत्री आदरणीय श्री नीतीश कुमार की अध्यक्षता में मुझे सम्मानित होने का अवसर प्राप्त हुआ।

मैं अपने शाखा में कठिन मेहनत करते रहा परिणामतः मैं अपनी शाखा में अंतिम रूप से संस्थान का टॉपर बना जिसका श्रेय संस्थान के प्राचार्य, ब्रांच के एच ओ डी के साथ साथ समस्त शिक्षकगण को देता हूं जिनके आशीर्वचनों ने मुझे मेरे सपनों को पूरा करने में पंख लगा दिए।


राजकीय पॉलिटेक्निक कॉलेज के मेधावी छात्र–छात्राओं को किया गया सम्मानित

**Sumit kumar pandey**
**Mechanical**
**2018 - 2021**

**As an alumnus of government polytechnic lakhisarai. I am writing to express my profound gratitude for the transformative experience I had during my time at our college days. Reflecting on my journey since diploma, I am continuously reminded of the invaluable lessons, cherished memories, and lifelong friendships that were cultivated within the walls of our this wonderful institution.**

**My college government polytechnic lakhisarai holds a special place in my heart, not only for the academic excellence it provided but also for the nurturing environment that encouraged personal growth and development. The dedicated faculty and staff played a pivotal role in shaping my intellectual curiosity and giving me a passion for lifelong learning.**

**Beyond the classroom Government polytechnic lakhisarai offered a vibrant and inclusive community where diverse perspectives were celebrated, and creativity flourished. Whether through extracurricular activities, community service initiatives, or cultural events, I was constantly inspired by the spirit of collaboration and innovation that permeated our campus. And from the my point of views all the credit goes in to Dr Rakesh ranjan sir ( principal ) aur our beloved HOD of Mechanical department mr. Suraj sir.**
**All the current students, i encourage you to seize every opportunity that GP lakhisarai has to offer. Embrace the challenges, cherish the friendships, and dare to dream big. And create a positive environment for study, sports and in many other activities.**
**All the faculty members and staff of our college i am heartily thankful for these unwavering support which you had provided on these day & that is the main reason we Excel in engineering and we have lots of chances for excell in many more fields of engineering.**
**My fellow allumni i am requesting for your support and guidance for current students who is studying in our GP lakhisarai.**
**Lastly i want to say that i am so proud to say i was studied in guidance of Dr. R K ranjan sir ( principal of GP LKR ) & mr. Suraj sir ( HOD of ME) from the Government Polytechnic Lakhisarai.**

# "दहेज प्रथा"

लेकर दहेज का कर्ज़ एक बाप ,
हर रोज वह मर जाता है।।

जन्म लेकर नन्हीं सी गुड़िया ,
जब जब धरती पर आती है।
मां - बाप से चिपके चिपके वह,
जाने कब बोझ बन जाती है।।

क्या बीता होगा उस दिल पर,
जिसने बेटों सा अधिकार दिया।
लाज,शर्म,मर्यादा छोड़ वह,
जमाने का दलदल पार किया।।


सहज भाव से नित्य प्रति वह ,
उसकी अभिलाषा पूरी कर जाता है,
लेकर दहेज का कर्ज़ एक बाप,
हर रोज वह मर जाता है।।

लेकर उसकी हर एक हठ,
सर पर पग सा सजाता है।
उसके हर सपने पूरे कर वो,
अंतरंग ही मुस्काता है।।

बिटिया को चोट लग जाए तो,
वह अपने अश्रु छलकाता है।
पर सीने में अपने दर्द लिए ,
जाने कैसे वह जी पाता है ।।

बेटी का कर कन्यादान वह,
बेटा ही एक खोया होगा।
लाख छुपा ले दर्द चेहरे से,
अकेला वो बहुत ही रोया होगा।।

गीली आंखों से हाथ जोड़,
ईमान को वह फैलाता है।
लेकर दहेज का कर्ज़ एक बाप,
जीते जी, ही मर जाता है।

साक्षी कुमारी
यांत्रिक अभियंत्रण

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