THE INSTITUTION OF ENGINEERS (INDIA)

TIRUCHIRAPPALLI LOCAL CENTRE

BHEL MAIN OFFICE ROAD, TIRUCHIRAPPALLI – 620 014

NEWS LETTER

JULY – 2024
Vol. 07 – Pages: 24

CONTENTS:

- Land Restoration, Desertification and Drought Resilience
- Carbon Credits in Agriculture
- Introduction to Generative AI
- Occupational Hazards & Control Measures
- IEI-Students chapter Inaugurated at K.Ramakrishnan College of Engineering.

ABOUT IEI TIRUCHIRAPPALLI LOCAL CENTRE (TLC)

The Institution of Engineers (India) or IEI is the largest multidisciplinary professional body that encompasses 15 engineering disciplines and gives engineers a global platform to share professional interest. Tiruchirappalli Local Centre of the Institution of Engineers (India) is located in Bharat Heavy Electrical Limited (B.H.E.L.)factory campus, Tiruchirappalli, Tamilnadu very close to the great engineering marvel, "the 1000 years old Grand Anaicut aka Kallanai. Tiruchirappalli Centre was inaugurated in the year 1973. Technical lectures are being conducted every week covering all branches of engineering.

EDITORS
Er.R.Selvaraj FIE
Dr.S.Titus MIE
Er.R.Muhammad Ehsan MIE

Chairman
Dr.S.Ravimaran FIE

Hon.Secretary
Er.SP.Lakshmanan, MIE

Joint Secretary
Dr.S.Titus MIE
Er.R.Muhammad Ehsan MIE

EDITORIAL NOTE

Dear Members,

On behalf of The Institution of Engineers, Tiruchirappalli local Centre, the editorial board is happy to bring out the July month News Letter. In this issue, reports of technical and celebration day activities conducted by the TLC such as Land Restoration, Desertification and Drought Resilience, Carbon Credits in Agriculture, Introduction to Generative AI, Occupational Hazards & Control Measures and IEI-Students chapter Inauguration at K.Ramakrishnan College of Engineering are presented. The committee of TLC meets every month under the leadership of our Chairman and secretary along with the senior members.

CHAIRMAN MESSAGE

Dear Members,

As our nation looks towards the future, our vision for a Viksit Bharat (Developed India) is driven by transformative initiatives and reforms that align with our commitment to progress and innovation. It is with great pride that we should have a strategic priorities and plans that are set to shape the landscape of our nation. One such thing is the digitization of land records in urban areas, coupled with GIS mapping, which will further enhance the efficiency of land management systems. Also to foster sustainable growth, we are focused on enhancing the availability of capital for climate adaptation and mitigation investments. We recognize the critical role of data in driving informed decision-making. Therefore, improving data governance, collection, processing, and management in all engineering domains remains a priority. By enhancing our capabilities in this domain, we aim to empower various sectors with accurate and timely data, driving efficiency and innovation across the board. Engineers are committed to realizing a future where innovation, sustainability, and inclusivity are the cornerstones of our national development.

Warm regards,

Dr.S.Ravimaran
Chairman, IEI Tiruchirappalli Chapter

Important Communications:

- IEI Tiruchirappalli Local Centre Chairman Dr.S.Ravimaran FIE inaugurated the student's chapter at K.Ramakrishnan College of Engineering (Autonomous) – on 03.06.2024 under Information Technology.

- IEI Sponsored All India Workshop at K.Ramakrishnan College of Engineering (Autonomous) Tiruchirappalli, on "Role of AI in Hybrid Electric Vehicle and Battery Management Systems" scheduled on9th and 10thAugust 2024.

TECHNICAL ACTIVITIES:

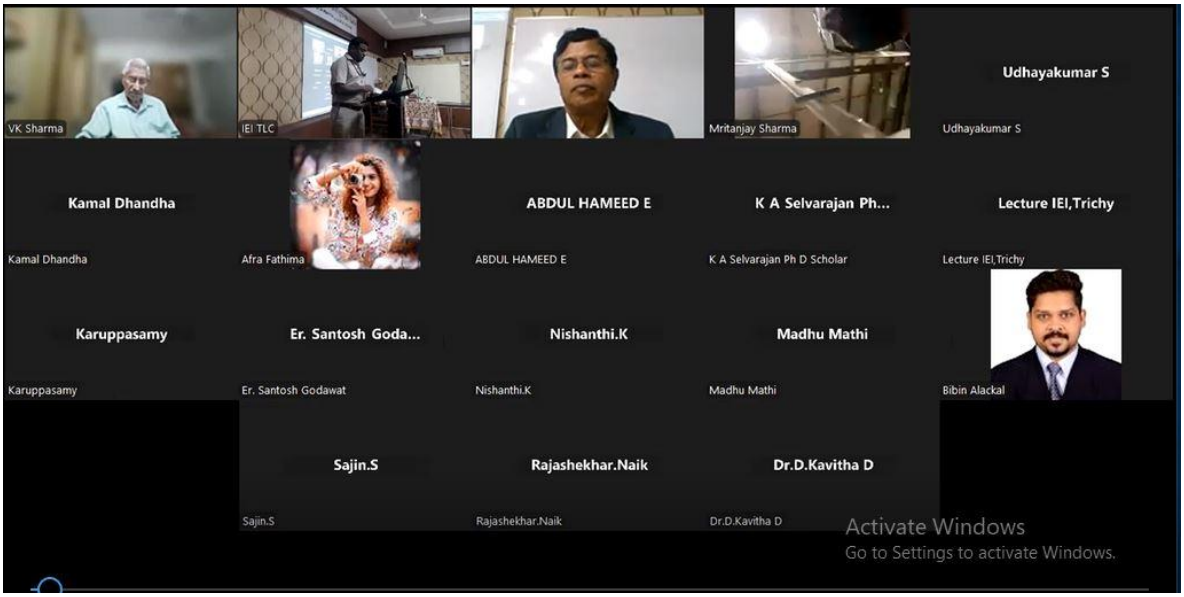
1.Title: : Land Restoration, Desertification and Drought Resilience

Name of Centre / Overseas Chapter:		**TIRUCHIRAPPALLI LOCAL CENTRE**	
Title of Activity:		**World Environment Day – 2024** Theme : Land Restoration, Desertification and Drought Resilience	
Activity under Divisional Board		Statutory Day	
Date:	**04-06-2024 at 06.00 p.m.**	Mode:	Online and offline (Hybrid mode)
No. of Participants : 52			

Chief Guest:

V.Sundararaju.IFS
Former Deputy Conservator of Forests
Tiruchirappalli-620017

The Tiruchirappalli Local Centre of The Institution of Engineers (India), in association with Indian Institute of Welding Tiruchirappalli branch, Computer Society of India, Tiruchirappalli Chapter, Safety Quality Forum - IEI /New Delhi, , Indian welding Society Southern zone, Indian Institute of Metals Tiruchirappalli Chapter, Indian Institution of Industrial Engineering Tiruchirappalli, Indian Institution of Plant Engineers Trichy chapter, Kumari Arivial Peravai Kanyakumari and Indian Society for Non-destructive Testing Trichy chapter celebrate the World Environment Day on the theme : Land Restoration, Desertification and Drought Resilience on 04th June 2024 at 06.00 pm through the hybrid mode(online&offline) Er.R.Selvaraj Past Chairman of IEI/TLC has presided over & welcomed the Chief Guest V.Sundararaju.IFS,Former Deputy Conservator of Forests,Er.D.Senthil Kumar Hon.Secretary of CSI Tiruchirappalli chapter has introduced the speaker to the audience.Er.S.Lakshmanan past Secretary of IEI/TLC has proposed vote of thanks.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The Institution of Engineers (India)
TIRUCHIRAPPALLI LOCAL CENTRE
The Institution of Engineers (India)
Tiruchirappalli Local Centre
Cordially invite you for the celebration of
World Environment Day - 2024
WORLD ENVIRONMENT DAY
Land Restoration, Desertification and Drought Resilience
June 2024 Tuesday @ 6:00 P.M. (I S T)
Online & offline (Hybrid mode)
Chief Guest

Building resilience against drought

- Severe and frequent dry spells cause drought.
- Droughts jeopardize agriculture and water resources.
- We have to bolster our resilience against poverty through **integrated water resource management, improved agricultural practices and community empowerment.**
- Only if the **ecosystems flourish**, the communities can thrive happily.
- By enhancing **water efficiency**, **promoting soil conservation** and implementing **drought-resistant technologies**, we have to safeguard our planet's landscapes for future generations.

Building resilience against drought

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ENVIRONMENT-OUR HERITAGE

- Environment is our Heritage.
- Our forefathers lead a harmonious life with nature.
- As a result they have given to us a healthy and wealthy environment.
- It is our bounden and foremost duty to handover a clean environment to our future generations.

Conserve Biodiversity

- The Tamil Nadu Government has taken earnest efforts to improve the ecosystems combined with socio-economic development.
- Establishment of first **Dugong Conservation Reserve** spread over 448 square kilometers in Palk Bay covering the coastal waters of Thanjavur and Pudukkottai districts.
- **Nanjarayan Bird Sanctuary** covering an extent of 125.87 hectares in Thiruppur district.
- **Kadavur Slender Loris Sanctuary** covering an area of 11,806 hectares in Dindigul and Karur districts.
- An **Elephant Reserve in Agasthiyamalai** with an area of 1,19,748.26 hectares in the districts of Tirunelveli and Kanyakumari.
- The Government of Tamil Nadu recently has constituted the **State-level Committee for Vulture Conservation (SLCVC).**
- **'Project Nilgiri Tahr'** has been launched in 2022 to safeguard the animal.

Restore Freshwater Ecosystems

- Freshwater ecosystems keep the land fertile.
- They supply food and water to billions of people and protect us from droughts and floods.
- They provide habitats for countless plants and animals.
- Due to pollution, climate change and over-extraction, they are fast disappearing.
- We have to improve the water quality and avoid polluting them.
- We should take steps to restore degraded rivers and wetlands.*
- Invasive species should be removed & native species should be planted.
- Wetland Conservation Mission is implemented by Tamil Nadu.

Renew Coastal & Marine Areas

- Oceans and seas provide us with oxygen, food and water.
- They mitigate climate change.
- More than 3 billion people in developing nations rely on marine and coastal biodiversity for their livelihoods.
- Many countries restore blue ecosystems- including mangroves, salt marshes, kelp forests and coral reefs.
- They enforce strict regulations on pollution, excess nutrients, agricultural runoff, industrial discharge and plastic waste to prevent them leaching into coastal areas.

Save the Soil

- Soil is the planet's most biodiverse habitat.
- About **60 % of all species live in soil** and **95 % of the food** is produced from it.
- Healthy soil acts as a carbon sink, locking greenhouse gases and playing a key role in climate mitigation.
- Farmers should be encouraged to follow organic and soil-friendly farming.
- Compost and organic materials should be added to soil to improve its fertility.
- Irrigation techniques like drip irrigation and mulching can help maintain soil moisture levels and prevent drought stress.

Make Agriculture Sustainable

- Globally, about 2 billion people from rural and poorer areas depend on agriculture for their livelihoods.
- But, unfortunately our present system of management is unsustainable and cause land degradation.
- Governments can promote **regenerative agriculture** to increase food production while preserving ecosystems.
- Governments should provide **subsidies to farmers** and encourage sustainable practices.
- **Climate resilient crops** can be developed; **harness indigenous knowledge to develop sustainable farming methods**; use **organic pesticides and fertilizers** to avoid harming soil health; **consumers** can use **millets and locally grown vegetables**.

2. Title : Carbon Credits in Agriculture

Name of Centre / Overseas Chapter:		**TIRUCHIRAPPALLI LOCAL CENTRE**	
Title of Activity:		Carbon Credits in Agriculture	
Activity under Divisional Board		Agricultural Engineering	
Date:	**11-06-2024 at 06.00 p.m.**	Mode:	Online –Zoom App.
No. of Participants : 71			

Speaker:
Mr.RM.Bhaskar
FPO consultant
Sammunati Agro Services
Hyderabad-500032

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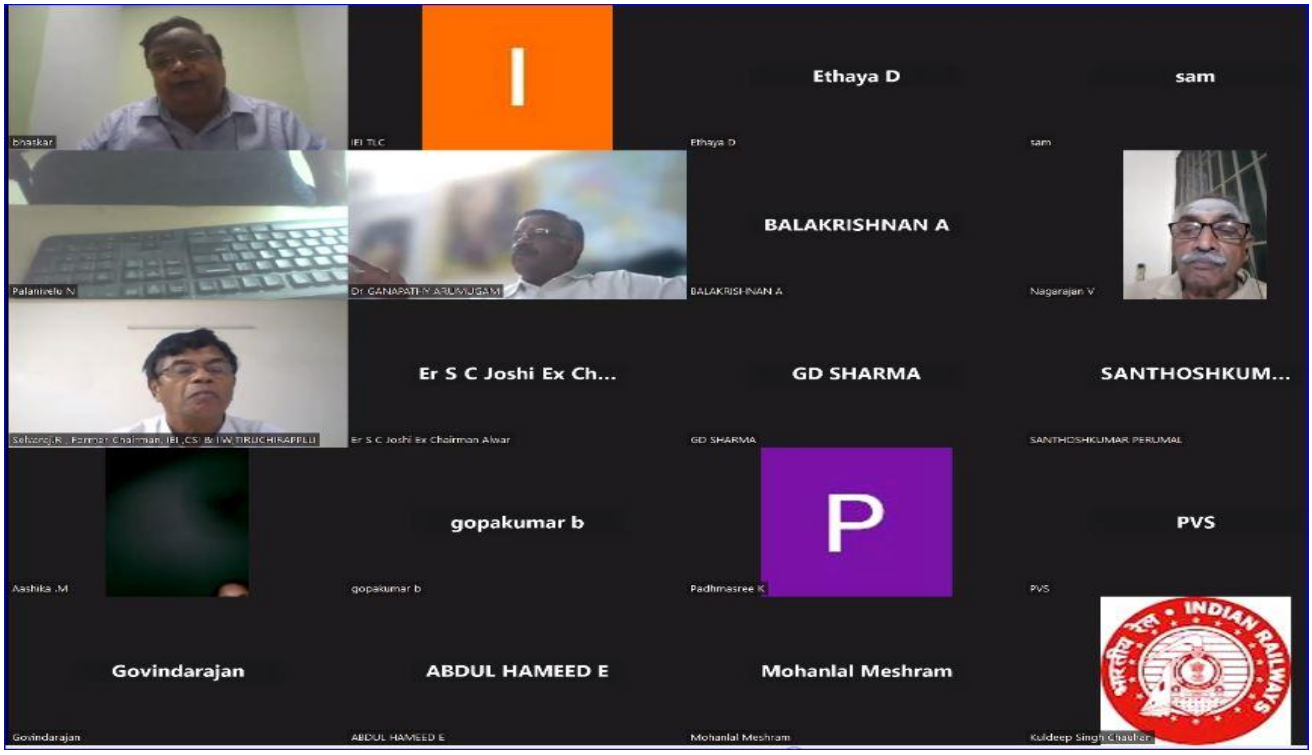
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Padhmasree K
PVS
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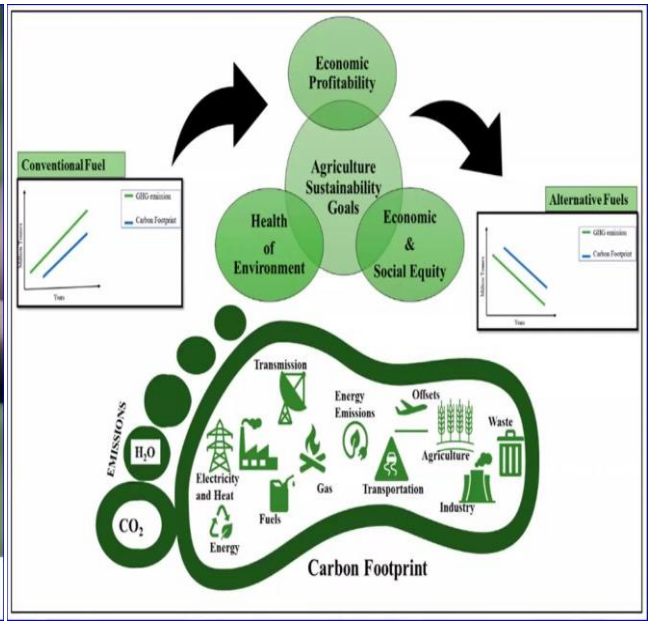
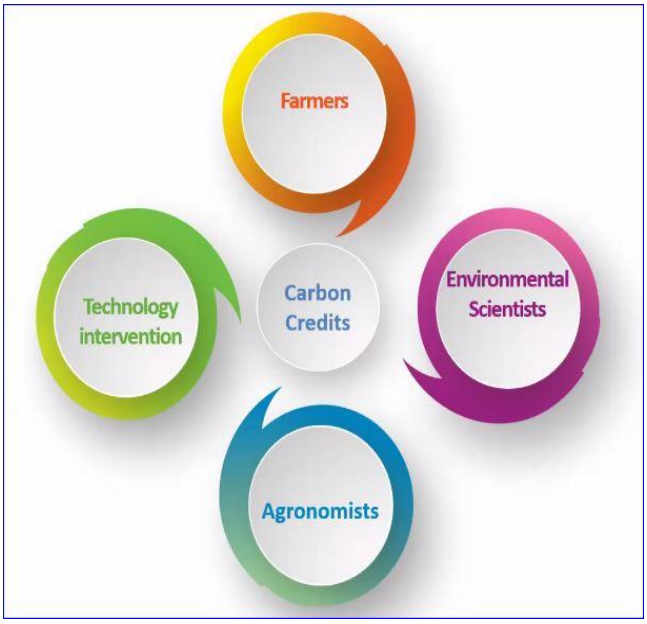
ABDUL HAMEED E
Mohanlal Meshram
Kuldeep Singh Chauhan
INDIAN RAILWAYS

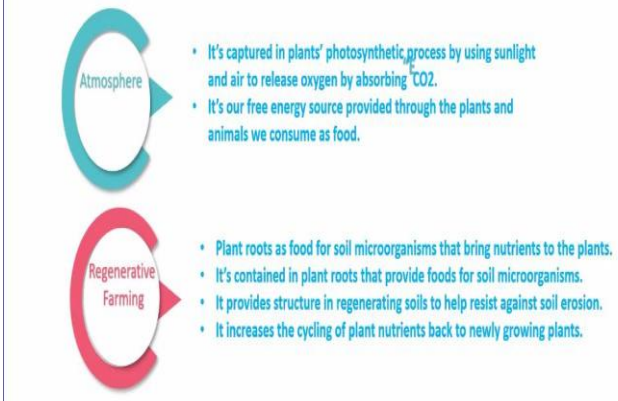
CARBON CREDIT
A Better Farm Economics


Economic Profitability
Conventional Fuel
Agriculture Sustainability Goals
Health of Environment
Economic & Social Equity
Alternative Fuels
Transmission
Energy Emissions
Offsets
Waste
Agriculture
Industry
Transportation
Gas
Fuels
Electricity and Heat
Energy
EMISSIONS
H_2O
CO_2
Carbon Footprint

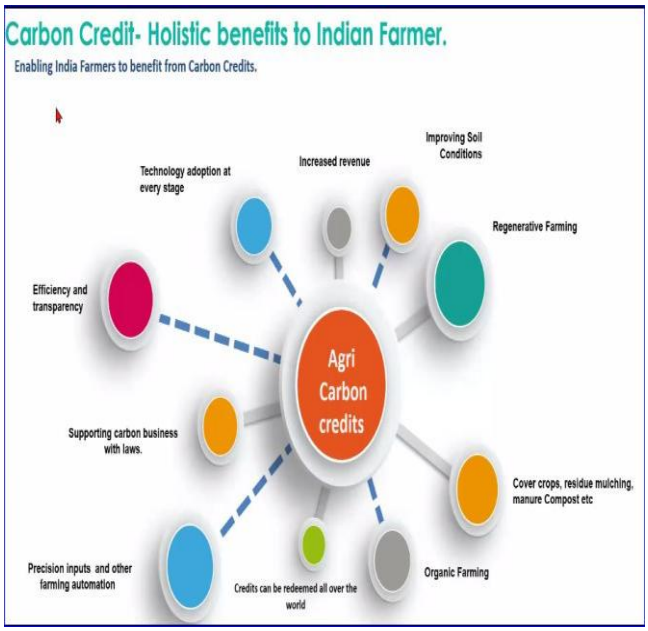
Carbon in Indian Agriculture - Positive transition

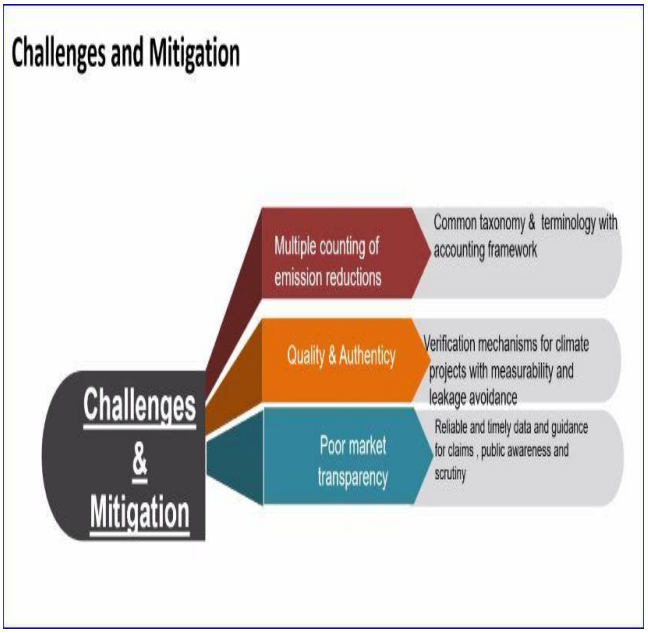


Carbon in Agri – Two ways



Challenges and Mitigation





Carbon Credit Pricing by Type

Project Type:	Volume Sold (MtCO2e):	Average Price:	Price Range:
Wind	12.8	$1.9	$0.3 - $18
REDD+	11	$3.3	$0.8 - $20+
Landfill methane	7.9	$2	$0.2 - $19
Tree planting	3	$7.5	$2.2 - $20+
Clean cookstoves	3	$4.9	$2 - $20+
Run-of-river hydro	1.5	$1.4	$0.2 - $8
Water/purification	1.2	$3.8	$1.7 - $9
Improved forest management	0.8	$9.6	$2 - $17.5
Biomass/biochar	0.7	$3	$0.9 - $20+
Energy efficiency - industrial-focused	0.7	$4.1	$0.1 - $20
Biogas	0.6	$5.9	$1 - $20+
Energy efficiency - community-focused	0.6	$9.4	$3.3 - $20+
Transportation	0.5	$2.9	$2.2 - $6.8
Fuel switching	0.5	$11.4	$3.5 - $20+
Solar	0.3	$4.1	$1 - $9.8
Livestock methane	0.2	$7	$4 - $20+
Geothermal	0.1	$4	$2.5 - $8
Agro-forestry	0.1	$9.9	$9 - $11

3. Title: Introduction to Generative AI

Name of Centre / Overseas Chapter:		**TIRUCHIRAPPALLI LOCAL CENTRE**	
Title of Activity:		Introduction to Generative AI	
Activity under Divisional Board		Computer Engineering	
Date:	**18-06-2024 at 06.00 p.m.**	Mode:	Online –Zoom App.
No. of Participants : 101			

Speaker:
Dr.R.Saranya
Assistant Professor
Department of Computer Science
Central University of Tamil Nadu
Thiruvarur – 610005
Tamilnadu,India

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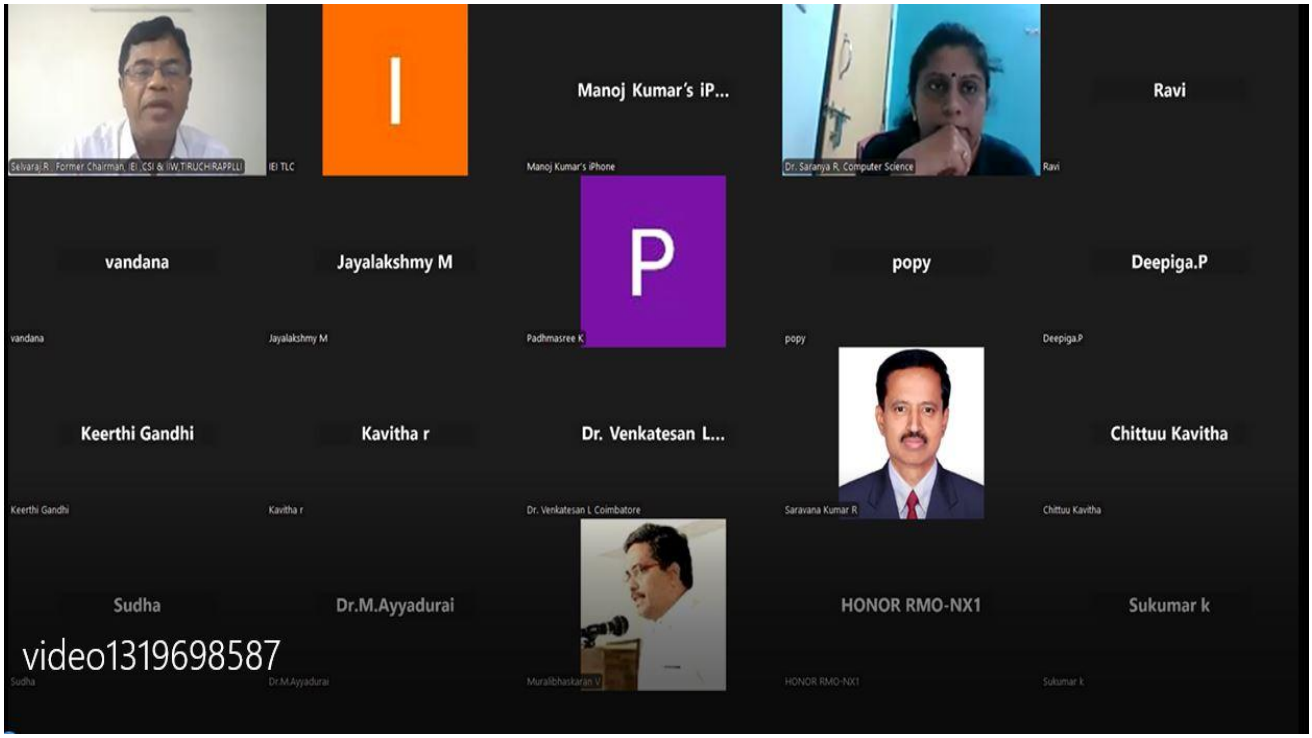
Selvaraj.R - Former Chairman, IEI, CSI & IIW TIRUCHIRAPPLLI
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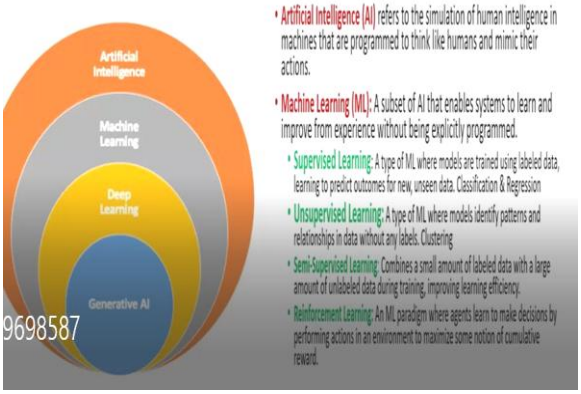
Introduction to Generative AI (GenAI)
Artificial Intelligence
Machine Learning
Deep Learning
Generative AI
• Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions.
• Machine Learning (ML): A subset of AI that enables systems to learn and improve from experience without being explicitly programmed.
• Supervised Learning: A type of ML where models are trained using labeled data, learning to predict outcomes for new, unseen data. Classification & Regression
• Unsupervised Learning: A type of ML where models identify patterns and relationships in data without any labels. Clustering
• Semi-Supervised Learning: Combines a small amount of labeled data with a large amount of unlabeled data during training, improving learning efficiency.
• Reinforcement Learning: An ML paradigm where agents learn to make decisions by performing actions in an environment to maximize some notion of cumulative reward.
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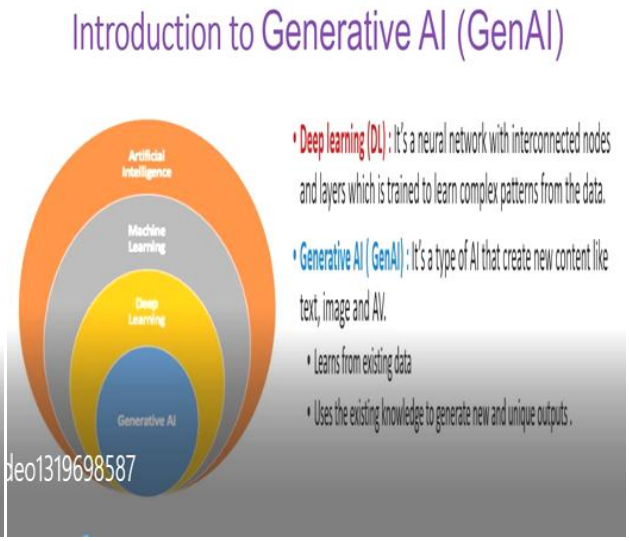
Introduction to Generative AI (GenAI)
Artificial Intelligence
Machine Learning
Deep Learning
Generative AI
• Deep learning (DL) : It's a neural network with interconnected nodes and layers which is trained to learn complex patterns from the data.
• Generative AI (GenAI) : It's a type of AI that create new content like text, image and AV.
• Learns from existing data
• Uses the existing knowledge to generate new and unique outputs .
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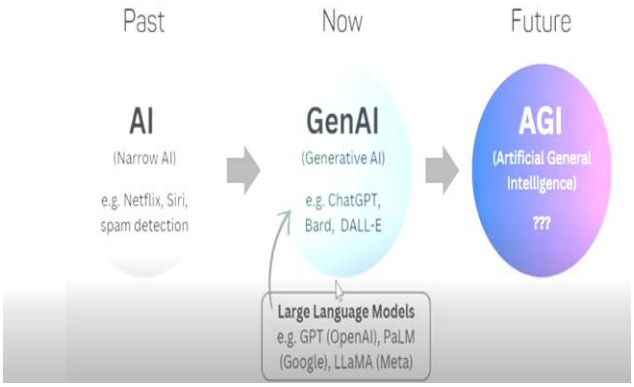
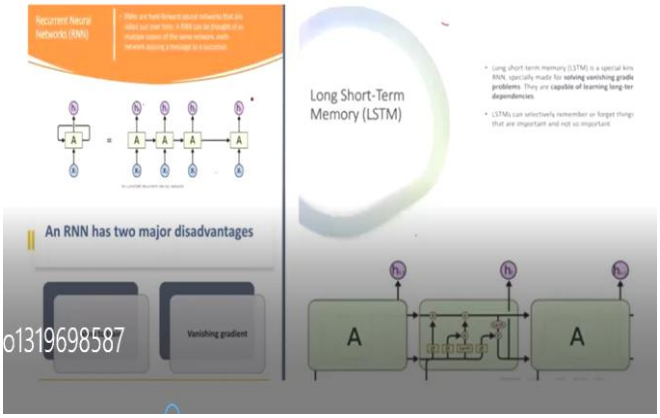
AI is no longer a distant possibility; it's a present reality



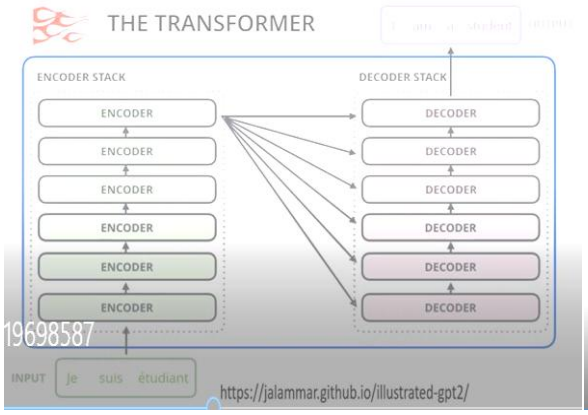
Concept – Language Modeling

Concept – Language Modeling

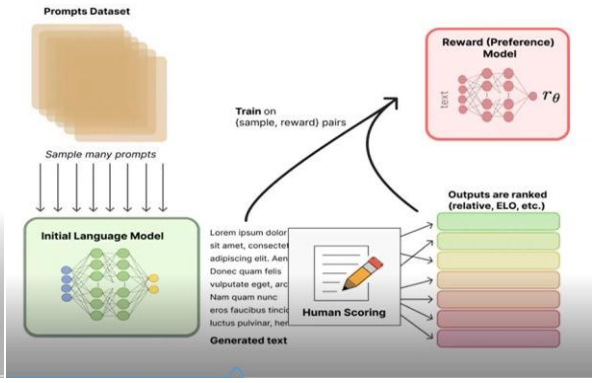
Journey of Language Model : From RNN to GPT



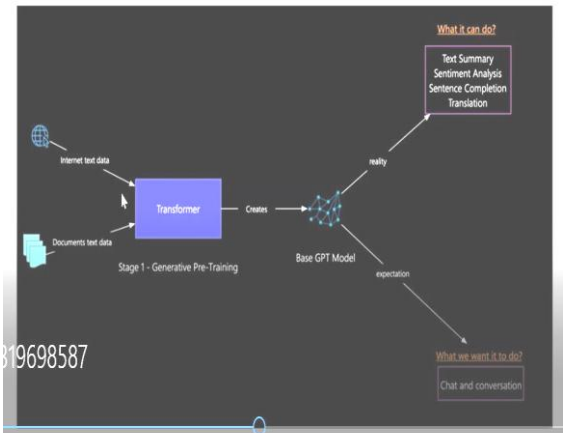
Encoder – Decoder



Reinforcement Learning through Human Feedback (RLHF)



Stage 1 — Generative Pre-Training



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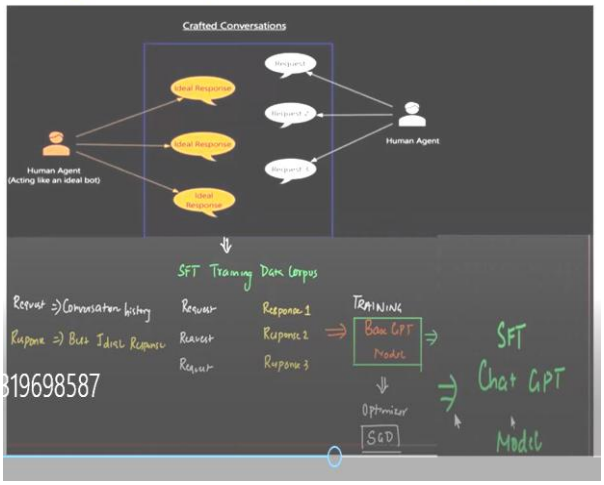
Stage 2 — Supervised Fine-Tuning (SFT)



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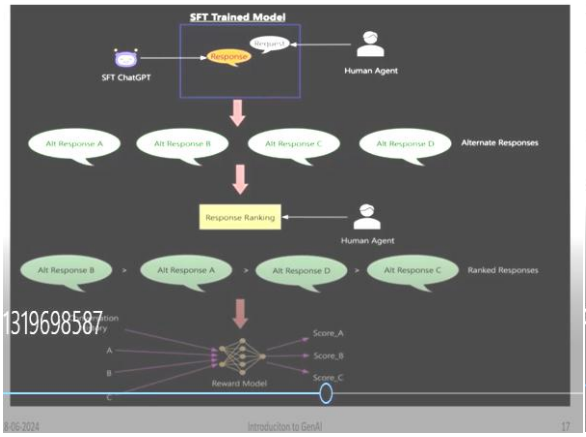
Stage 3 — Reinforcement Learning through Human Feedback (RLHF)



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Popular GENAI Chatbots

- Claude AI
- ChatGPT can only remember up to 12,000 words worth of conversation, Claude takes this to 75,000 words.
- Safety and Factual Accuracy
- When it comes to generating its responses, Claude's "constitutional design".

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Limitations of GenAI

- ✓Hallucinations are words or phrases that are generated by the model that are often nonsensical or grammatically and factually incorrect.
  - ✓The model is not trained on enough data. Misleading information.
  - ✓The model is trained on noisy or dirty data. "Garbage in => Garbage out!"
  - ✓The model is not given enough context. Incomplete information.
  - ✓The model is not given enough constraints. Anyone can use it.
- ✓Ethical concerns — what if the models are biased and are used for unintended purposes.

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Will AI risk the job? Replace Humans

- Don't want to lose the Job?
- Basics – Strong foundation
  - To increase productivity – Use AI tools (Skillset - ChatGPT, Github Copilot, Code Interpreter)
- AI is not a Threat but Benefit
- Kill salaries or Replace
  - Human Customer Service
  - Proof Readers
  - Paralegal services
  - Content Creators

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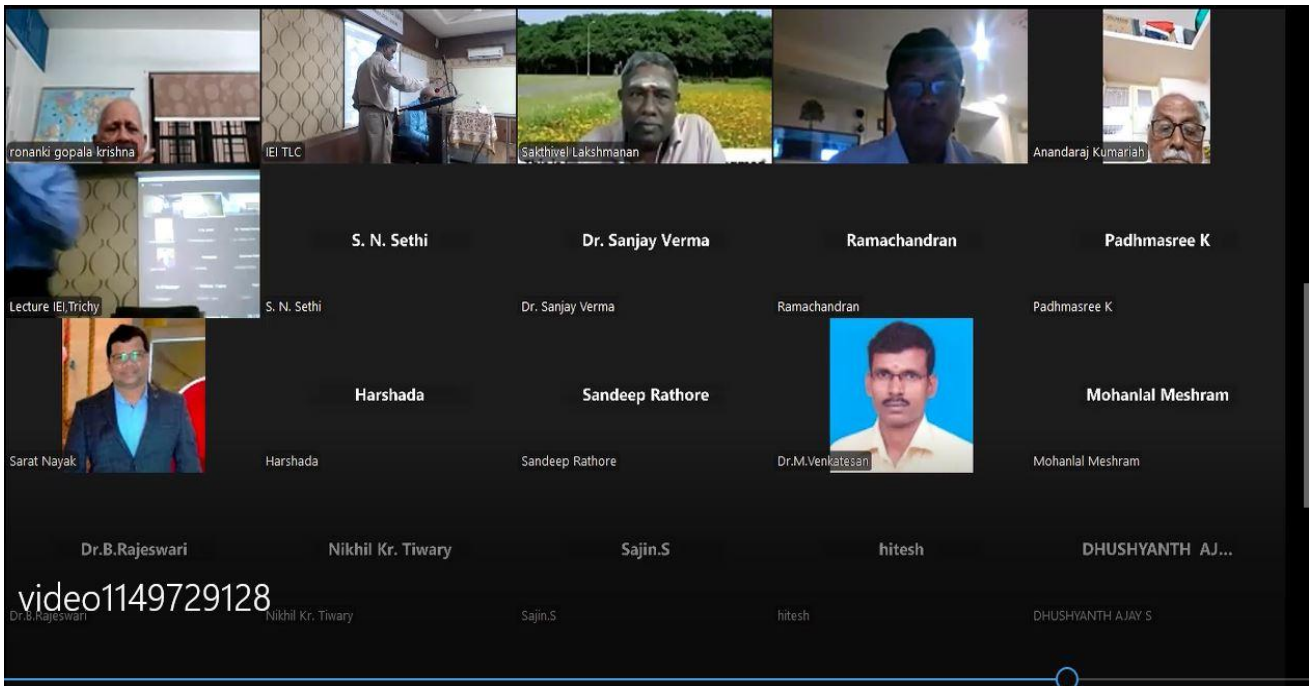
4. Title: Occupational Hazards & Control Measures

Name of Centre / Overseas Chapter:	**TIRUCHIRAPPALLI LOCAL CENTRE**		
Title of Activity:	Occupational Hazards & Control Measures		
Activity under Divisional Board	General & Inter Disciplinary		
Date:	**25-06-2024 at 06.00 p.m.**	Mode:	Hybrid mode (Online &offline).
No. of Participants : 61			

Speaker:
Er.R.Krishnamoorthy FIE
Former General Manager
Oil &Natural Gas Corporation Ltd.
Mumbai

The Tiruchirappalli Local Centre of The Institution of Engineers (India), in association with Indian Institute of Welding Tiruchirappalli branch, Computer Society of India, Tiruchirappalli Chapter, Safety Quality Forum - IEI /New Delhi, , Indian welding Society Southern zone, Indian Institute of Metals Tiruchirappalli Chapter, Indian Institution of Industrial Engineering Tiruchirappalli, Indian Institution of Plant Engineers Trichy chapter, Kumari Arivial Peravai Kanyakumari and Indian Society for Non-destructive Testing Trichy chapter organized a lecture on 25th June 2024 at 06.00 pm through Hybrid mode .(online & offline). Er.Ramachandran former Deputy general Manager Bharat Heavy Electricals Ltd.Tiruchirappalli has presided over & welcomed the speaker Er.R.Krishnamoorthy FIE,Former General Manager,Oil &Natural Gas Corporation Ltd.Mumbai.

Er.S.Lakshmanan past secretary of IEI/TLC has introduced the speaker to the audience. Er.R.Selvaraj,Past Chairman of IEI/TLC has proposed vote of thanks.


ronanki gopala krishna
IEI TLC
Sakthivel Lakshmanan
Anandaraj Kumariah
Lecture IEI,Trichy
S. N. Sethi
Dr. Sanjay Verma
Ramachandran
Padhmasree K
Sarat Nayak
Harshada
Sandeep Rathore
Dr.M.Venkatesan
Mohanlal Meshram
Dr.B.Rajeswari
Nikhil Kr. Tiwary
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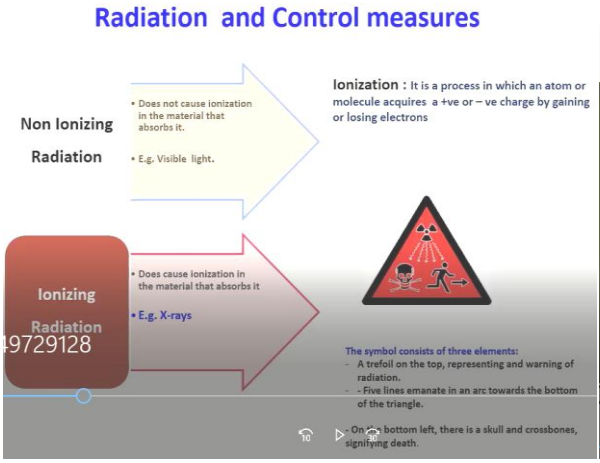
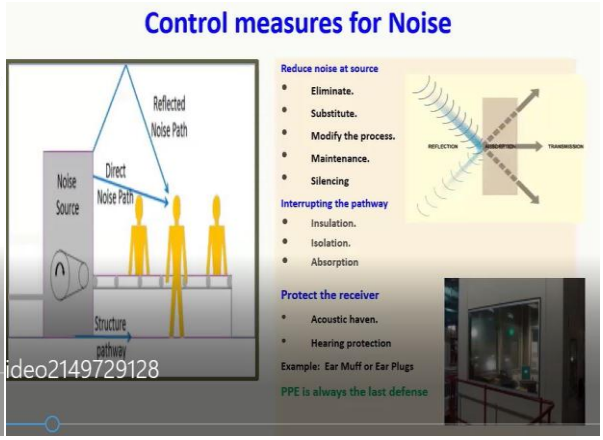
The Institution of Engineers (India)
TIRUCHIRAPPALLI LOCAL CENTRE
THE INSTITUTION OF ENGINEERS (INDIA)
INCORPORATED BY ROYAL CHARTER 1935
ESTABLISHED 1920

The Institution of Engineers (India)
TIRUCHIRAPPALLI LOCAL CENTRE
Dr. A.P.J. ABDUL KALAM


Radiation and Control measures
Non Ionizing Radiation
• Does not cause ionization in the material that absorbs it.
• E.g. Visible light.
Ionization : It is a process in which an atom or molecule acquires a +ve or – ve charge by gaining or losing electrons
Ionizing Radiation
• Does cause ionization in the material that absorbs it
• E.g. X-rays
The symbol consists of three elements:
- A trefoil on the top, representing and warning of radiation.
- Five lines emanate in an arc towards the bottom of the triangle.
- On the bottom left, there is a skull and crossbones, signifying death.


Control measures for Noise
Reflected Noise Path
Direct Noise Path
Noise Source
Structure pathway
Reduce noise at source
Eliminate.
Substitute.
Modify the process.
Maintenance.
Silencing
Interrupting the pathway
Insulation.
Isolation.
Absorption
Protect the receiver
Acoustic haven.
Hearing protection
Example: Ear Muff or Ear Plugs
PPE is always the last defense

Types of Non Ionizing Radiation

Types	Sources	Health Effects	Protection
Ultraviolet (UV)	Sunlight Arc welding	Skin burns Arc eye Skin cancer	Cover exposed skin Protect eyes
Visible light	Lasers	Temporary blindness	Low class: avoid shining in eyes High class: eye protection, shielding, non-reflective surfaces
Infra red (IR)	Red-hot steel Glass manufacture	Redness and skin burns, retinal burns, cataracts	Cover exposed skin Protect eyes
Microwaves	Food preparation Telecommunications	Internal heating Organ damage	Safe distance Isolate and lock off
Radio waves	Radio, TV Radar	Internal heating Organ damage	Safe distance Isolate and lock off

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Radiation measurement

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Units of Radiation — Becquerel and Sievert

Becquerel (Bq)
Unit indicating the amount of radioactivity

One nucleus decays per second = 1 becquerel (Bq)

Radioactive materials

Sievert (Sv)
Unit of radiation exposure dose that a person receives
Associated with radiation effects

1 mSv from outside the body

1 mSv from within the body

Nearly equal effects on the human body

Becquerel is a unit of radioactivity and focuses on where radiation comes from.

It is used to express the amount of radioactive materials contained in soil, foods, tap water, etc.

The higher the value expressed in becquerels, the larger the radiation being emitted.

Sievert is a unit of radiation exposure dose that a person receives and is used with regard to what is exposed to radiation, i.e. the human body.

The larger the value expressed in sieverts, the larger the effects of radiation to which the human body is exposed

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Radiation measurement

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Basic Radiation Protection

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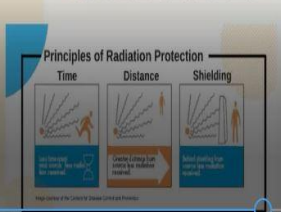
- Eliminate exposure so far as is reasonably practicable.
- Reduce exposure to the lowest level reasonably practicable.
- Do not exceed the relevant radiation dose limits
- Risk-assessed by a competent person.
- Training and information.
- Health surveillance



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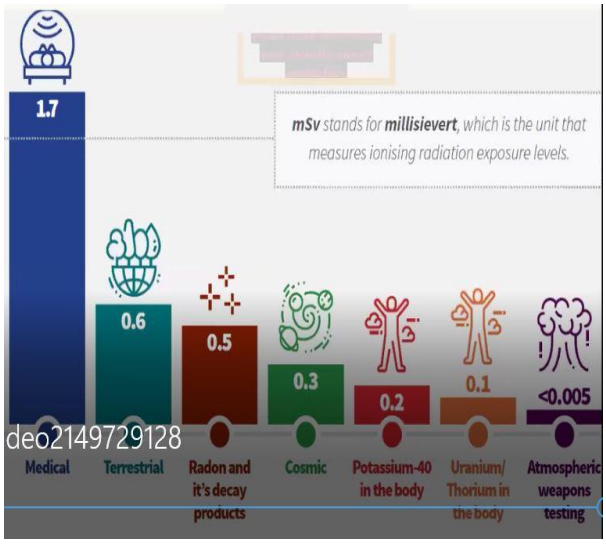

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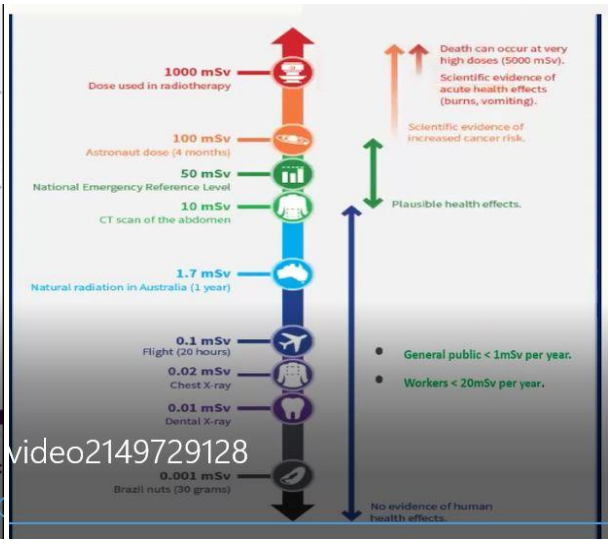

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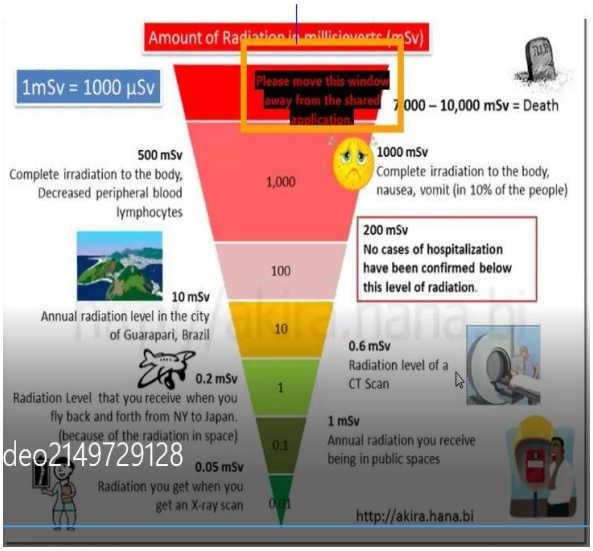
Amount of Radiation in millisieverts (mSv)
1mSv = 1000 µSv
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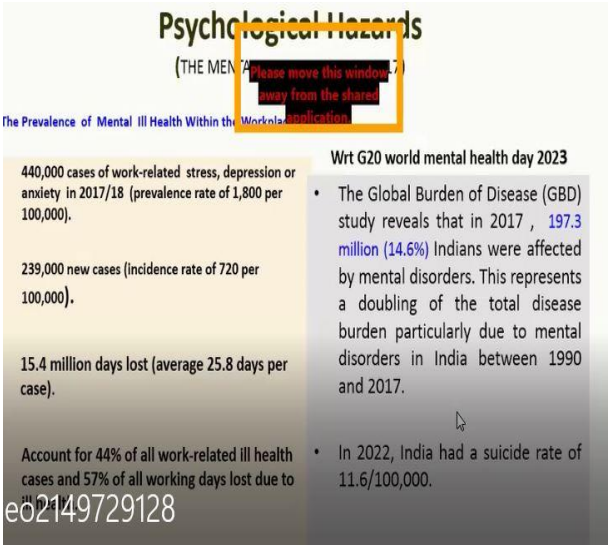
7,000 – 10,000 mSv = Death
500 mSv
Complete irradiation to the body, Decreased peripheral blood lymphocytes
1,000
1000 mSv
Complete irradiation to the body, nausea, vomit (in 10% of the people)
200 mSv
No cases of hospitalization have been confirmed below this level of radiation.
100
10 mSv
Annual radiation level in the city of Guarapari, Brazil
10
0.6 mSv
Radiation level of a CT Scan
0.2 mSv
Radiation Level that you receive when you fly back and forth from NY to Japan. (because of the radiation in space)
1
1 mSv
Annual radiation you receive being in public spaces
0.1
0.05 mSv
Radiation you get when you get an X-ray scan
0.01
http://akira.hana.bi


Psychological Hazards
(THE MEN
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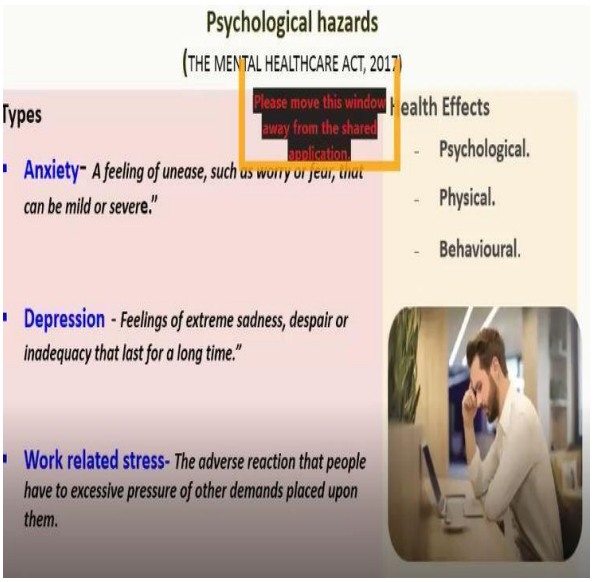
The Prevalence of Mental Ill Health Within the Workpla
440,000 cases of work-related stress, depression or anxiety in 2017/18 (prevalence rate of 1,800 per 100,000).
239,000 new cases (incidence rate of 720 per 100,000).
15.4 million days lost (average 25.8 days per case).
Account for 44% of all work-related ill health cases and 57% of all working days lost due to
Wrt G20 world mental health day 2023
The Global Burden of Disease (GBD) study reveals that in 2017 , 197.3 million (14.6%) Indians were affected by mental disorders. This represents a doubling of the total disease burden particularly due to mental disorders in India between 1990 and 2017.
In 2022, India had a suicide rate of 11.6/100,000.


Psychological hazards
(THE MENTAL HEALTHCARE ACT, 2017)
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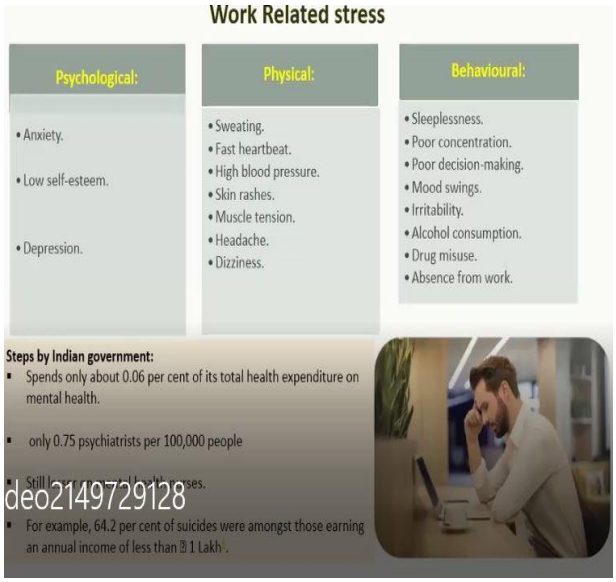
Types
Anxiety- A feeling of unease, such as worry or fear, that can be mild or severe."
Depression - Feelings of extreme sadness, despair or inadequacy that last for a long time."
Work related stress- The adverse reaction that people have to excessive pressure of other demands placed upon them.
ealth Effects
- Psychological.
- Physical.
- Behavioural.


Work Related stress
Psychological:
Anxiety.
Low self-esteem.
Depression.
Physical:
Sweating.
Fast heartbeat.
High blood pressure.
Skin rashes.
Muscle tension.
Headache.
Dizziness.
Behavioural:
Sleeplessness.
Poor concentration.
Poor decision-making.
Mood swings.
Irritability.
Alcohol consumption.
Drug misuse.
Absence from work.
Steps by Indian government:
Spends only about 0.06 per cent of its total health expenditure on mental health.
only 0.75 psychiatrists per 100,000 people
For example, 64.2 per cent of suicides were amongst those earning an annual income of less than ₹ 1 Lakh .

IEI-TLC Inaugurated New Students Chapter @ KRCE - IT DEPARTMENT

Institutional Membership code: IM000599-3
Students' Chapter Code: 621112/KRCE/IT

The Institution of Engineers (India) IE(I) head quartered in Kolkata aims to promote the needs of the student community, acts as a platform to connect with global engineers and actively encourages R&D programs through various promotional aids. In addition, IE(I) is supporting many types of activities such as Lectures, Seminars, Symposia, Workshops and other educational programs. The Institution of Engineers India (IEI) Students Chapter-IT Branch at K. Ramakrishnan College of Engineering, Trichy, Tamil Naduis recognized as an authorized Students' Chapter. The Institution of Engineers (India), Kolkata, approves it. The inauguration of IE (I) Student's Chapter was held on 3rd June 2024.

Student Chapter of IEI was inaugurated at Department of Information Technology, K. RamakrishnanCollege of Engineering, Trichy, Tamil Nadu on 3rdJune 2024. Dr.S.Ravimaran, Chairman, IEI, Tiruchirappalli Local Centre, Trichywas Chief Guest and Dr.D.Srinivasan, Principal, K. Ramakrishnan College of Engineering felicitated the function. Dr. S. Manikandan, Professor & Head, Department of Information Technology, K. Ramakrishnan College of Engineering welcomed the guests and participants for the program and briefed about the departmental activities and achievements.

Mrs. R. Kamalitta, Faculty Advisor, declared the names of Executive Committee Members of IEI Students' Chapter - IT Branch for the Academic year 2024-2025 and discussed about activities scheduled in coming future in the students' chapter. All student members were felicitated by the guests.

Dr. S. Ravimaran, Chairman, IEI, Tiruchirappalli Local Centre, Trichy declared the IEI Student Chapter opened and briefed about the activities of IEI, Headquarters and Tichy Local Centre. He also discussed the importance of technical activities to student community and assured all possible help from Local Centre to the chapter for organising technical activities. Dr.D.Srinivasan, Principal, K. Ramakrishnan College of Engineering shared his experience, knowledge, expertise and enlightened everyone present in the function.

Mrs. S. Sathyapriya, Assistant Professor, IT presented the vote of thanks. The program was successfully organized and coordinated by Department of Information Technology, K. Ramakrishnan College of Engineering, Trichy, Tamil Nadu.

Chief Guest Dr.S.Ravimaran, chairman/IEI-TLC inaugurated the IEI student's chapter in the Department of Information Technology at KRCE. Dr.D.Srinivasan, Principal, K.Ramakrishnan College of Engineering (Autonomous) delivered the felicitation address.

CELEBRATED

50th YEAR

Published by

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