The Master Stroke

Volume 2

A QUATERLY NEWSLETTER

AUGUST ' 22

DEPARTMENT OF MECHANICAL ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA , BILASPUR (C.G.)

RECAP....

Release of First Quarterly Newsletter "The Master Stroke" of Department of ME, SoS (E&T), GGV by the Honourable Vice Chancellor prof. Alok Kumar Chakrawal

To extend the reach and strengthen ties, the Department of Mechanical Engineering, School of Studies of Engineering And Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur, launched the first edition of Mechanical Engineering Newsletter - "The Master Stroke" Issue 1, Volume 1, December-March 2022 on May 2nd, 2022, which was inaugurated by the Hon'ble Vice-Chancellor Prof. Alok Kumar Chakrawal, Registrar Prof. Shailendra Kumar and Head of Mechanical Engineering Department & Dean of the School of Studies of Engineering and Technology, Prof. T.V. Arjunan.

On the occasion, Prof. Chakrawal described the newsletter as a reflection and progressive essence of the Mechanical family. He was quite happy to know about the department's various events, activities and ongoing and upcoming research. The "Master Stroke" covers the inside story of departmental activities and the achievements of the faculty and students, MoU signed with highly acclaimed Industries, upcoming events, and many more.

The Faculty Coordinators of "The Master Stroke" Newsletter are, Mr. Pradeep Patanwar, Mrs. Shweta Singh, and Mr. Biplab Das, Department of Mechanical Engineering narrated the success story of the 360-degree transformation of the Mechanical Engineering Department from December'2021 to March'2022. Student Coordinator Ms. Diksha Gupta along with her team members Mr. Aakashdeep Srivastava, Mr. Manik Raghuwanshi, Mr. Rahul Chandra, and Mr. Manthan Suryvanshi very well designed and edited the newsletter.

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Prof. T. V. Arjunan

HOD, DEPARTMENT OF MECHANICAL ENGINEERING

FROM THE HOD'S DESK

Mechanical Engineering is a professional core engineering discipline that deals with the design, production and maintenance of all industrial products. In line with this, the department of Mechanical Engineering, GGV works with the objective of addressing critical challenges faced by the industry, society and academia, with the most crucial being our unceasing commitment to our students, helping them to learn, grow, develop, and achieve their goals in their pursuit to excel in their professional career.

Our department has a team of highly qualified and experienced faculty, good infrastructure, and lab facilities. We are continuously endeavoring to enhance the quality of education and maintain its leadership position in engineering and technology. We always work with the motto "Nothing can be achieved without genuine effort." Our faculty are continuously attending various training programs, publishing research papers, books, and filing patents, with many pursuing research. Our department has been conducting seminars and conferences to keep the faculty and students abreast with the latest developments in the field of technical education. We are happy to share that many students are pursuing higher studies in leading universities in India and abroad. I am certain that our students will prove to be invaluable assets in the given platform..

This newsletter is an effort which I aim to make our students learn different activities so that they can heartly involve themselves in various programs of the department.

My warm wishes to the entire team for their excellent work.

LATEST DEVELOPMENTS

ASTRONOMERS AT MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) AND OTHER UNIVERSITIES ACROSS CANADA AND THE UNITED STATES HAVE DETECTED A STRANGE AND PERSISTENT RADIO SIGNAL FROM A FAR-OFF GALAXY THAT APPEARS TO BE FLASHING WITH SURPRISING REGULARITY.

The signal is classified as a fast radio burst, or FRB — an intensely strong burst of radio waves of unknown astrophysical origin, that typically lasts for a few milliseconds at most. However, this new signal persists for up to three seconds, about 1,000 times longer than the average FRB.

Within this window, the team detected bursts of radio waves that repeat every 0.2 seconds in a clear periodic pattern, similar to a beating heart.

AUTO MANUFACTURING COMPANIES IN INDIA WILL START MAKING FLEX-FUEL ENGINE POWERED VEHICLES.

Flex fuel vehicles can run on both petrol and Ethanol. India is aiming to achieve E10 by 2022 and E20 (which would evolve a 20% ethanol blend) by 2025. At present, there is no flex- fuel-powered engines or vehicles except a limited-edition TVS s Apache RTR motorcycle.

Ethanol at present E10 is available across the country, and will be made so by 2022 is hygroscopic and tends to absorb moisture making it difficult to store in pure form. Its affinity to attract moisture can also lead to impurities settling at the base of the fuel tank and contaminating the engine.

According to the government, all vehicles manufactured since 2008 are E10 compatible (but not optimized) E100 ethanol will be sold at a lower price from ethanol pumps.

Source: MIT, Hindustan Times

STUDENT RESEARCH ARTICLES

The Green Hydrogen Solution

In the Paris agreement, countries around the world agreed to pursue efforts to limit global warming to well below 2 degrees Celsius, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. This demands them to reduce their greenhouse gas emissions to 'net zero' by around 2050, which is possible to achieve if investment in fossil fuels is redirected to zero-carbon alternatives.

Amongst all these, only green hydrogen is 100% sustainable, making it an attractive topic for researchers. Recently, researchers at the Georgia Institute of Technology and Georgia Tech Research Institute (GTRI) have designed a new category of catalyst- a better oxide substrate that uses less noble elements. The catalyst performed better in oxygen and hydrogen splitting than the present catalysts involving rare and expensive metals like platinum and iridium. The team also found that the catalyst's shape is significant because it determines the optimization. Moreover, they focused on using this catalyst for long without performance degradation and understanding the involved reaction mechanics. One such popular alternative is hydrogen which has a high potential energy carrying capacity due to its greater energy density (142 kilo - joules per gram) than fossil fuels. It's a popular choice amongst energy sources because it produces water on combustion, not troublesome carbon emissions. Although being the most common chemical structure in the universe, it's rarely found on its own. It's generally bonded with other elements. But, it can be separated in its pure form via various processes, based on which, itself being transparent is classified as grey, blue, turquoise, and green.

There is no doubt that green hydrogen can help us reach our net-zero goal if produced on a large scale. But, currently, it poses some challenges, with the most important being cost and high energy consumption. The electrocatalyst developed by the GTRI can solve the cost issue to a considerable extent. Still, further study is required in this field to reduce the cost level at which it could replace fossil fuels and reduce the energy losses also. That's why the next immediate step is to accelerate the deployment of renewable electricity to decarbonize existing power systems, accelerate the electrification of the energy sector via low-cost renewable electricity, then decarbonize difficult-to-electrify sectors such as heavy industry, shipping, and aviation through green hydrogen.

The electrocatalyst prepared by the GTRI from hybrid materials reduces the cost and increases the efficiency of green hydrogen production.

MEGHNA CHOUDHARY
STUDENT, B.TECH (5TH SEMESTER)
DEPARTMENT OF MECHANICAL ENGINEERING

IMPROVED STEAM CONDENSER

Mesophase an MIT-based company is developing a more efficient power plant steam condenser that leverages a surface coating developed in the lab of Evelyn Wang, Ford Professor of Engineering. These condensers are integral to the energy extraction process in most of the world's power plants. According to Yajing Zhao SM'18, a Ph.D. candidate at Massachusetts institute of technology (MIT), this coating can last long enough for industrial applications and be made with a high potential to scale up.

Compared to other alternatives this has a better performance both in terms of heat transfer and life expectancy. In most power plants, condensers cool steam to turn it into water. The pressure change caused by this creates a vacuum that pulls steam through a turbine. Mesophase's surface coating improves the condenser's ability to transfer heat, thus allowing operators to extract heat more efficiently. Based on lab tests the company predicts that it can increase power plant output by up to 7 percent using existing infrastructure. This can help in increasing the global electricity production by 500 Terawatt-Hour(TWH) and also lead to reduction in water use.

The company believes the new material can be installed in power plants during scheduled maintenance which takes place every 2 years or so.

Considering the fact that about half of India's current power needs are met by thermal power plants increasing the efficiency of our power plants is necessary to meet the ever-rising power demand. Also augmenting the capacity of power generation will help us mitigate a future coal crisis apart from reducing our need to create additional thermal power stations which are detrimental to our climate goals.

The condenser technology has merit and is easily implementable in India. It will help in making power production more economical, in addition to reducing freshwater consumption in power plants.

MAINAK GHOSH
STUDENT, B.TECH (5TH SEMESTER)
DEPARTMENT OF MECHANICAL ENGINEERING

DEPARTMENTAL ACTIVITIES

WEBINAR ON INDUSTRY READY ENGINEERS

The department of mechanical engineering, Guru Ghasidas Vishwavidylaya, successfully conducted a webinar on “Industry Ready Engineers” on April 7, 2022. The aim of the program was to make students familiar with the needs and skill requirements to the industries so that the students can acquire the right skills and qualities.

The program was convened by Prof T. V. Arjunan, Dean (SoS, E&T), accompanied by teacher coordinator Mr. Bhushan Singh Gautam, Asst. Professor (ME) and other assistance provided by the student coordinator B.Vennela and Rahul Chandra.

The guest and speaker of the program was Mr C Prakash. He is an alumnus of IIT Madras, presently working in the product development department, Ashok Leyland Limited, Vellivoyalchavadi, Chennai, and has 35 years of experience in the field of engines. Also, he is quite passionate about training fresh engineers.

The speaker illustrated to the students how they can apply theoretical knowledge in practical applications. He explained, that knowledge is like paint; it does no good unless it is applied.

Also, he emphasized the importance of teamwork. Moreover, it was an eyeopening interaction, which probably clears all the doubts and confusion a fresher has

MR. C PRAKASH

INTELLECTUAL PROPERTY AWARENESS PROGRAM

The School of Studies of Engineering & Technology, GGV. Bilaspur (C.G.) has affectively conducted the "Intellectual Property Awareness Program" dated Apr 29 onwards in E-classroom. All the actions and deeds associated with this program were well structured, established, and satisfactorily coordinated by a team of coordinators Dr. Jasinta Poonam Ekka, Disha Dewangan. and co-coordinators Dr. Princy Matlani and Amit Dewangan. The program has gained magnificent popularity among the faculties and students of the School of Studies of Engineering and Technology and more than 220 faculties and students enthusiastically attended the event.

The program was organized in association with AICTE and NIPAM on the occasion of world intellectual property day on 26 April under the intellectual Property literacy week celebration. Prof. T.V. Arjunan, Dean, School of Studies of Engineering & Technology has delivered a welcome address.

Prof. T.V. Arjunan, Dean, delivered a concise speech on "Intellectual Property Rights" and stated that it helps in developing and maintaining a company's long-term revenue streams and increases shareholder value. Amit Saxena usher in the program with an inaugural address and gave insights about Intellectual Property (IP) and its significance in the development of Digital India. Prof. Shailendra Kumar, Registrar GGV, Bilaspur (C.G.) partaken his warm welcome to the speaker and casted a light on the "Importance of Intellectual Property Rights(IPR)".

The resource person of the program Mr Manshu Chandrakar, Examiner of patents and design. RGNIIPM, Nagpur, Maharashtra, explained the various aspects of IPR, Patent, trademark and copyright. He also cleared the patentable and non-patentable inventions with examples. He briefed the procedure for the filing of patents and the various steps involved in granting patents. The program was ended with a Vote of Thanks given by Dr. Jasinta Poonam Ekka, the program coordinator.

AN INTERACTIVE TALK ON ENERGY, CLIMATE CHANGE & I

The Renewable Energy Club of School of Studies (Engineering & Technology), Guru Ghasidas Vishwavidyalaya Bilaspur conducted a session on Energy, Climate change & I on 22 June 2022 in the E-classroom of IT building. The aim of the program was to create awareness among the students about ENERGY, CLIMATE CHANGE & I and benefits of solar energy usage and also to aware them about the global warming and measures to reduce the carbon emission.

The program was convened by Dr. Prof T. V. Arjunan, Dean (SoS, E&T), accommodated by teacher coordinator Mr. Manish Bhaskar (Assistant Professor, Dept of Mechanical Engineering), Mr. Chandan Tamrakar (Assistant Professor, Dept of Elect. & Communication Engineering), Mr. Somnath Singaroul (Assistant Professor, Dept of Ind. & Prod. Engineering).

Guest speaker of the program Prof. Chetan Singh Solanki “Solar Man of India & Solar Gandhi” With Energy Swaraj Yatra Bus Visited School spokes on global warming Climate change and reduce carbon emission ,different ways to reduce carbon emission and use of solar energy.

AN INSPIRING JOURNEY FROM GGV TO ISRO BY OUR ALUMNI

SAMEER AHMAD
SRF(ISRO)

Hello, To all my juniors as well as faculties of GGU Bilaspur, I am Sameer Ahmad, One of the student of GGU, who completed M. Tech. from GGU in 2019. After that my dream came true and my real journey started and it is still going on to achieve its final orbit. Yes, here I have written orbit because in my thinking, in my habits, and all inside me there is the curiosity to know about space science deeper and deeper and this is the thing that pushed me towards my dream goal and that was to enter in Indian Space Research Organization (ISRO).

Half you have an extreme desire to achieve something in your life then definitely you will find your path to reach it. A similar thing happened to me, I tried three times to clear ISRO'S ICRB Exam to become an Engineer in ISRO but every time I failed to crack the written test but I never gave up and the 4th time I appeared in ISRO's Vikram Sarabhai Space Centre's (VSSC) JRF Exam. Thanks to GGU's best professors who guided and helped me to score good marks in M.Tech. which opened the first door as the screening stage of that exam after that I got selected for an interview and finally cracked it. Presently I am working in Composite Entity in VSSC, ISRO Trivandram and here I am exploring the great things with great scientists ISRO's work culture is also very good because here not only you can explore and enjoy your area but also you can gain different area's knowledge related to space if you are interested in that. Besides my job, I am also doing a Ph.D. in Aerospace Engineering from the Indian Institute of Space Science and Technology (IIST), Trivandram. ISRO offers and encourages higher studies to all JRFs and it's all employees so if you are interested in Ph.D. then this is the best road map for you which I followed but you have to work very hard by keeping patience if you are thinking about Ph.D. Program. I always suggest to all students that don't think it's too late or we can't do anything which we like. Only the things you need for success are your passion for your goal, hard work, determination, and a positive approach to handling all obstacles which will come your way.

"Keep growing, keep learning and become Achievers."
Thanks to Shweta mam for giving me this opportunity to share my experience and I wish the Best of Luck to all students for their career goals.

Sameer Ahmad
SRF (ISRO) & Ph.D. Scholar (IIST)

ALUMNI TALK

MR. UDAYAN VIDYANTA

The department of Mechanical Engineering, Guru Ghasidas Vishwavidylaya, successfully conducted an alumni talk “SAMVAAD” On May 5 2022. The aim of the program was to make students aware of the future and career opportunities as a Design Engineer.

Our Alumni Udayan Vidyanta (Product Designer, Gojek) had shared his interesting journey of finding his dream job in product designing and will guide all the students of Mechanical Engineering, GGV in finding a career in this field. The program was convened by Dr. Prof T. V. Arjunan, Dean (SoS, Engg. & Tech.), accommodated by teacher coordinator Mrs.Shweta Singh, Asst. Professor (ME) and Mr. Prateek Gupta, Asst. Professor (ME), other assistance provided by the student coordinator Megha Pathak, Kunal Dewangan and Rahul Chandra.

FACULTY ACHIEVEMENTS

PUBLICATIONS

Dr. Jasinta Poonam Ekka published an article titled: solar photovoltaic Thermal System: A Comprehensive Review on Recent Design and Development, Applications and Future Prospects in research. The paper was published in the International Journal of Ambient Energy on 7th April 2022.

https://scholar.google.co.in/citationsview_op=view_citation&hkean&user.DyKFb_4AAAAJ&citation_for_view.DyKFb_4AAAAJ: WF5omc3nYNoC

Dr. Anoop Kumar Sahu Decision-making framework for supplier selection using an integrated MCDM approach in lean-agile-resilient-green environment evidence from the Indian automotive sector. The paper was published in The TOM Journals on 9th May 2022.

https://www.emerald.com/insight/content/doi/10.1108/TQM-12-2021-0372/full/html

Dr. T.V. Arjunan published an article titled -Utilization of zinc-ferrite/water hybrid nanofluids on the thermal performance of a flat plate solar collector—a thermal modeling approach. The paper was published in Environmental Science and pollution research on 14th June 2022.

https://link.springer.com/article/10.1007/s11356-022-21261-3

Dr. T.V. Arjunan published an article titled -Investigation of mechanical and wear properties of A16061/Si3N4/Mg0 hybrid composite fabricated by stir casting method. The paper was published in Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering on 9th June 2022.

https://journals.sagepub.comidoi/abs/10.1177/09544089221105934?journalCode.piea

Dr. T.V. Arjunan published an article titled -A case study on the thermo- hydraulic performance of jet plate solar air heater using response surface methodology. The paper was published in Case Studies in Thermal Engineering in June 2022.

https://www.sciencedirect.com/science/article/pii/S2214157X22002295

Mr. Biplab Das and Mr. Prateek Gupta published an article titled - Fabrication and Mechanical properties analysis of coir, glass, carbon fiber reinforced epoxy-based composite. The paper was published in the International journal of mechanical and Production Engineering.

http://iraj.in

PATENTS FILED

Dr. Anoop Kumar Sahu filed a patent on Blockchain-Based Cloud Storage System on 22nd April 2022, having patent no. as 16/2022..
https://search.ipindia.gov.in/IPOJournal/Journal/ViewJournal

Dr. Anoop Kumar Sahu filled a patent on Block chain based cloud storage system on 22nd April 2022, having patent no. as 16/2022..
https://search.ipindia.gov.in/IPOJournal/Journal/ViewJournal

Dr. Anoop Kumar Sahu filed a patent on Automotive ERP System over Block chain technology on 6th May, having patent no. 18 / 2022.
L https://search.ipindia.gov.in/IPOJournal/Journal/ViewJournal

STUDENT ACTIVITIES

Every year January to April most of the IITs, NITs, and Central Universities open up their doors for students who want to do internships in that place. the institute gives topics to research under the guidance of professors, and students got stipends also for their work.

Some Institutes do not directly open or take applications for internships. But we have an option that we can directly approach professors through mail to do work on his/her guidance in our selected area of interest.

INTERNSHIPS/VOCATIONAL TRANINGS DONE BY STUDENTS

- At SAIL (Steel Authority of India Limited), Bhilai, Chhattisgarh
- At NTPC (National Thermal Power Corporation), Bilaspur, Chhattisgarh
- At SECR (South Eastern Central Railway), Bilaspur, Chhattisgarh
- At Indian Railways (North Eastern Railway), Gorakhpur, UP
- At IISC (Indian Institute of Science), Bangalore
- Hindustan Urvarak & Rasayan Limited (HURL), Gorakhpur

SPECIAL ACHIEVEMENTS

- Madhav Mishra, Student of B.Tech - Mechanical Engineering, secured 5th rank in National Kick Boxing championships from 18th August'22 to 22nd January'22. And he was also selected for the international Kickboxing World Cup (going to be held in Riyadh in October 2023).

MADHAV MISHRA

Farewell

batch 2018

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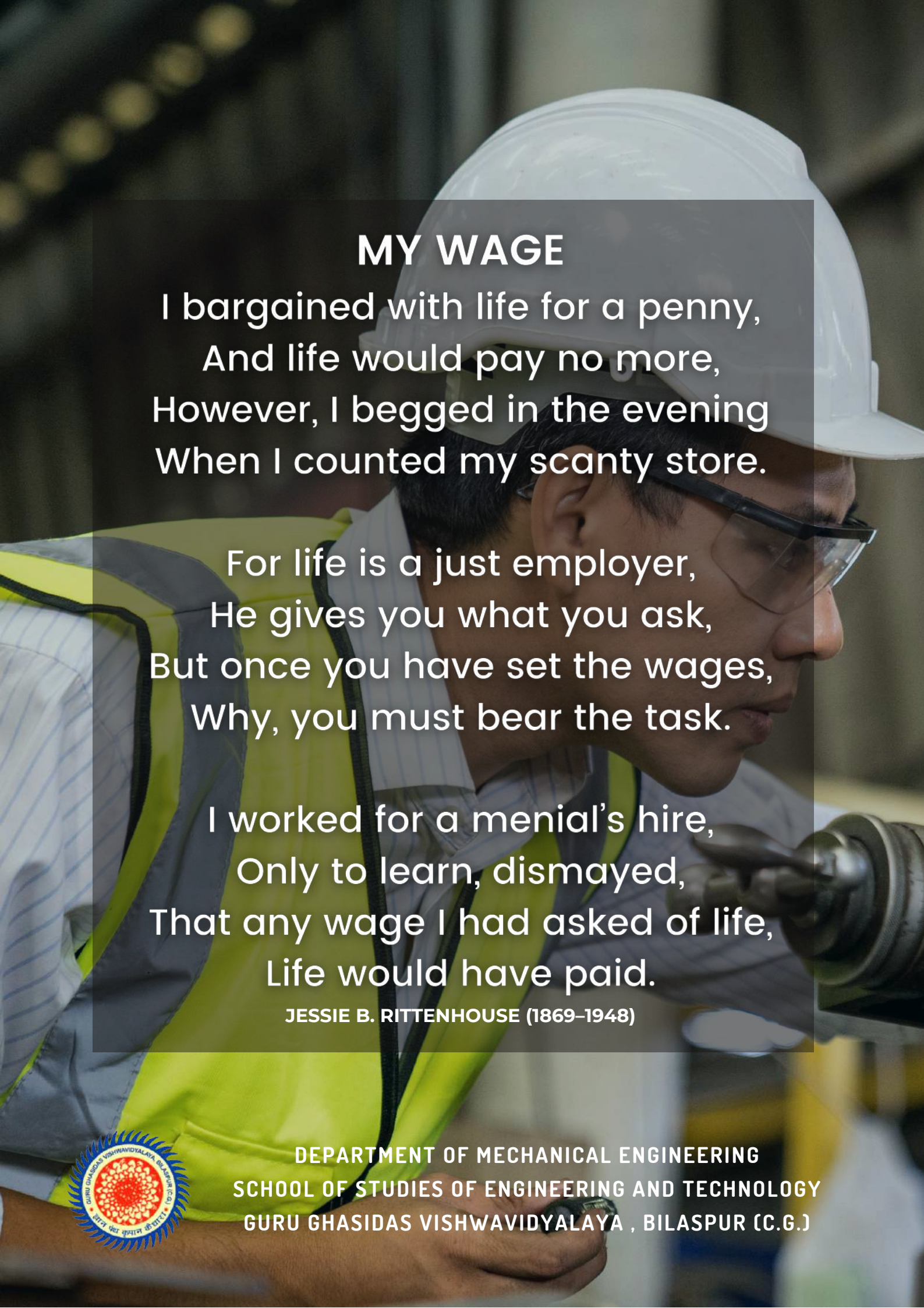

MY WAGE

I bargained with life for a penny,
And life would pay no more,
However, I begged in the evening
When I counted my scanty store.

For life is a just employer,
He gives you what you ask,
But once you have set the wages,
Why, you must bear the task.

I worked for a menial's hire,
Only to learn, dismayed,
That any wage I had asked of life,
Life would have paid.

JESSIE B. RITTENHOUSE (1869–1948)

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