# ASPIRE

Achievements in Sports, Projects, Industry, Research and Education

## Monthly Newsletter

Department of Mechanical Engineering
Volume 11 Issue 9 September 2021

# Sri Sivasubramaniya Nadar College of Engineering

SSN

Rajiv Gandhi Salai, Kalavakkam, Chennai, Tamil Nadu, India

# Ronald Ross: The trailblazer who traced malaria


> "Science is the Differential Calculus of the mind.
> Art the Integral Calculus; they may be beautiful when apart,
> but are greatest only when combined"

Carried by a miniscule vector, malaria is one of the deadliest contenders in pathology history affecting about 200 million people every year. The term malaria originates from Italian: 'mala aria' meaning bad air, to which the disease was attributed to during the medieval times. Looming for ages, the cataclysm was much dire up until the late nineteenth century, when Dr Ross's research work in propagation of the ailment demonstrating the origins of this mysterious disease to the world.

Ronald Ross was born in Almora (13 May 1857), then in the North-Western Provinces of Company-ruled India, northwest of Nepal. At the age of eight, he was sent to England where he did his schooling. Ross attended the St Bartholomew's Hospital Medical College after High school, initially wavering from studies, he spent his time composing music and theatre. After graduation he went on to practice as a surgeon in the Indian Medical Service in 1881.

Ross's first step in research was in 1895, during his posting in India; he observed the early stages of malarial parasite inside a mosquito stomach. In May of the following year, during his leave, he was able to visit a malaria-endemic region around Ooty, where he noticed a mosquito on the wall in a peculiar posture, and for this he called it "dappled- winged" mosquito on his first encounter. After two years of research failure, he managed to culture 20 adult "brown" mosquitoes from collected larvae. He successfully infected the mosquitoes from a patient; after blood-feeding, he dissected the mosquitoes. Consequently, he confirmed the presence of the malarial parasite inside the gut of mosquito, which he originally identified as "dappled-wings" It was this species that was later identified as the deadly **Anopheles mosquito**. For his research work he was awarded the Nobel prize in physiology in 1902. During this active career, Ross's interest lay mainly in the initiation of measures for the prevention of malaria in different countries of the world. He carried out surveys and initiated schemes in many places, including West Africa, the Suez Canal zone, Greece, Mauritius, Cyprus, and in the areas affected by the 1914-1918 war. One of his greatest contributions to the world was the development of mathematical models for the study of its epidemiology. His papers represented a profound mathematical interest which was not confined to epidemiology but led him to make material contributions to both pure and applied mathematics. Those related to pathometry (the quantitative study of disease) are best known and constitute the basis of much of the today's epidemiological understanding of insect-borne diseases.

# Campus Update

***Manu Chauhan, a student of VidyaGyan School Bulandshahr (a Shiv Nadar Foundation institution), secured admission at Stanford University with a 100% scholarship***

"I studied in the local government primary school in the village of Akrabad till grade 5. At the end of the year, I appeared for the entrance exam for Vidyagyan school and got selected. That was the year 2014," Manu shares, as he narrates his journey.

Vidyagyan School is, a residential school run by Shiv Nadar Foundation for the underprivileged in Uttar Pradesh. Every year about 2,50,000 students from the smallest villages appear for the entrance which selects only 250 students. In 2014, Manu was one of the 250. Cracking that scholarship and the school was the first step to the journey of his life.

Thanking his school, Manu shared that the school, with various efforts and a driven force, helped hone his talent and drove him towards excellence. The teachers and the peer group, all helped him find his niche and get a purpose. Motivation from the teachers at every step of the way helped him realize his academic goals but it was the conversation with his father that helped him find his ambition.

Read More

## *Shiv Nadar University Chennai*

Shiv Nadar University Chennai offers contemporary and state-of-the-art academic blocks that are designed to accommodate our students as they get ready to fill the corridors with the daily hustle and bustle!

"Shiv Nadar University Chennai is envisioned to evolve into the university of the future"

-Dr. Kala Vijayakumar, Founding Pro-Chancellor

We aim to empower students to dream big while promoting consciousness of life and bringing a paradigm shift to the development of outstanding leadership, research, knowledge, and ideas for innovation- https://youtu.be/r4aETljYlgY

# Campus Update

## Placement Update

**Gautham Ranjit** (Mech'22) got placed in **Thorogood Associates** with a CTC of 10 LPA.
Role: Business Intelligence and Analytics Consultant, Offer type: Internship + Employment
Salary:**10 LPA**.


A few Interesting Info shared by the candidate:
1. Among the 100s of SSN students applied for Thorogood (a much sought-after company by elite students across the globe), an initial shortlisting was done based on 8.5 CGPA criterion.
2. First Round a written test. Many could not clear.
3. Then few days later was the 8 am to 5 pm long haul round consisting of Case Study, Fact Finding Round where students must find facts asking queries based on a real time problem given), Group Activity Round like MUN and Interview. Only Five Got through from SSN and our Gautam was one among.
4. Then the next day there was an Interview Round and Only 3 got through and our Gautam is one among the three grabbing the enviable opportunity!!!

*Dr. N. Lakshmi Narasimhan*

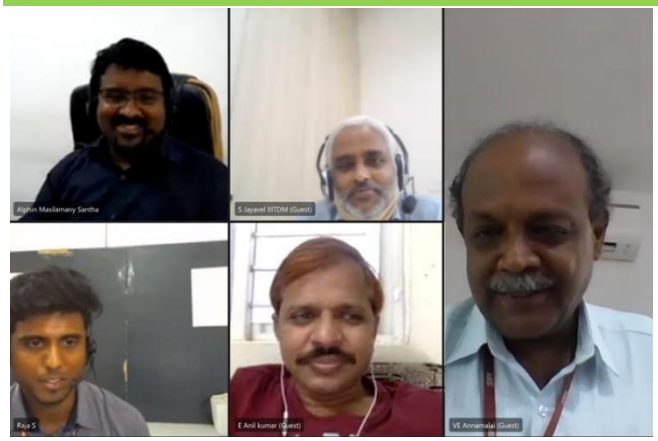
## New faculty for the Department

Dr. T Micha Premkumar joined as an Assistant Professor on 11 August 2021. He received his Ph.D. from Indian Institute of Technology Madras, Masters from Pondicherry University, Pondicherry and Undergraduate from University of Madras. His PhD work investigates the Experimental and Numerical Simulation of Non-cavitating and Cavitating Flows over S-shaped Hydrofoil used in Fully reversible pump turbine. Before SSN, He worked as Associate Professor in Hindustan Institute of Technology and Science for 9 years. He has qualified for Research Associateship 2010 to 2012, CSIR, New Delhi. He has been guiding 1 Ph.D scholars (thesis

submitted), and guided about 30 M.Tech Thesis. He has been filed 4 Indian patents in that 1 is published and other 3 are under review. His main research interests are in the areas of Turbomachine, Wind Energy, CFD, Tidal Energy, Cavitation, and Condition Monitoring. He has published widely in about 77 peer-reviewed international journals and conferences. He published 25 papers in Clarivate analytics listed journals and 52 papers in Scopus indexed journal. He has focused in the last few years on the research issues in small wind turbines and condition monitoring. He has participated in many conferences and research meet in the capacity of PC members, invited speakers, etc. He is closely associated with NIWE, Chennai and successfully completed 28 Lakhs worth funded project titled, "Design and Development of 1kW hybrid vertical axis wind turbine".

Dr. Dhamodharan P joined us on the 26th of July 2021 as an Assistant Professor (on contract). He obtained his Ph.D. from the Department of Energy and Environment at National Institute of Technology, Tiruchirappalli in 2021. His Ph. D thesis titled studies on energy recovery from HVAC condensate and its utilization for improving IAQ, thermal comfort and energy efficiency. He is BEE certified energy auditor (EA -24431) and carried out energy audits in different energy intensive industries. Prior to his Ph.D., having graduated from CEG campus, Anna University Chennai with a Masters in Refrigeration and Air Conditioning in the year 2013. He pursued his Bachelor's degree in Mechanical Engineering from Kongu Engineering College, Anna University, Chennai, in the year 2010. He worked for two years as Assistant professor in Kongu Engineering College, Perundurai (June 2013 to July 2015). His current areas of interest include Energy conservation in HVAC system, Indoor air quality and passive cooling using TES system.

## PhD Viva Voce of Dr. Raja S



Dr. Raja S, Assistant Professor defended his PhD thesis for Anna University in the Public Viva voce held on Aug 2021. Dr. Anil Kumar, Dean, IIT Tirupati and Dr. Jayavel, IIITDM were the external examiners and in the presence of the Principal.

Research Supervisor: Dr. Alphin M S.

## International Journal Publication - SCI Clarivate

*Srinivasa Rao, T., Selvaraj, M., Koteswara Rao, S. R., & Ramakrishna, T. (2021). Thermal cycles and their effects during friction stir welding of AA7075 thicker plates with and without in-process cooling. Materialwissenschaft und Werkstofftechnik, 52(3), 308-319.*

Friction stir welding of AA 7075 plates in three different thicknesses such as 10, 16 and 25 mm at natural convection condition was carried out successfully without defects. Water cooled friction stir welds were also produced on 16 mm thick plates. The thermal cycles at different locations of the plate, during the friction stir welding process, were predicted using a three-dimensional thermal model. Mechanical properties of the welds were evaluated using tensile and hardness tests. Weld microstructures were also examined with optical and transmission electron microscopes. The weld hardness values and tensile properties were found to decrease with increase in plate thickness. The use of water cooling was found to improve the weld properties to some extent, although not to the level of base metal. The reasons for this behavior are discussed, correlating thermal cycles, mechanical properties, fracture locations and precipitate morphology.

*Ashok V, Geetha N.B., Rajkumar S & Pauline T (2021) Experimental Investigations for Thermal Energy Management by Encapsulation of Nano -Enhanced Bio Phase Change Material in buildings, Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, DOI: 10.1080/15567036.2021.1967517*

## International Journal Publication - SCI Clarivate

*Vishal, K., K. Rajkumar, and P. Sabarinathan. "Effect of Recovered Silicon Filler Inclusion on Mechanical and Tribological Properties of Polytetrafluoroethylene (PTFE) Composite." Silicon (2021): 1-10.*

*Ramraji, K., K. Rajkumar, and G. Selvakumar. "Investigations on the influence of particle reinforcement and wire materials on the surface quality and machining characteristics of AA6061-TiB2 alloy in WEDM." Surface Topography: Metrology and Properties (2021).*

*Arumugam, Arun, Poovazhagan Lakshmanan, and Sarangapani Palani. "Micro groove cutting on the surfaces of Cu-B4C nanocomposites by fiber laser." Surface Topography: Metrology and Properties (2021).*

## External Recognition

Dr G Selvakumar , Associate Professor / Mech delivered an expert lecture (Online mode) titled 'Research avenues in Wire-EDM Process' on 7th August 2021, in the "Two Weeks Faculty Development Programme on Manufacturing Technology Research and Management (MTRM)" held during 2 to 14th August 2021, Organized by the Department of Mechanical Engineering, Aliah University, Kolkata, India.

Dr. Satheesh Kumar Gopal delivered a talk on "Modelling and Practical aspects of Mobile robots" on 21.08.2021 as a resource person for the Value-Added Program on Unmanned Aerial Vehicle between 14th August 2021 to 4th September 2021, Organized by the Design and Automation Research Group (SMEC), Vellore Institute of Technology, Chennai

Dr. K. Jayakumar, ASP/Mech delivered a guest lecture on "Advances in Unconventional Machining Processes" in 7 days ISTE sponsored online FDP on Unconventional Machining Processes at the Department of Mech. Engg., Sai Ram Engineering College, Chennai on 30.07.2021

## External Funded project Applied

Dr. C. Arun Prakash (PI) along with Dr. R. Vimal Samsingh (Co-PI) and Dr. Esther Florence (Co-PI) submitted a project proposal to DST under Science and Heritage Research Initiative (SHRI) scheme for a funding of **Rs.70,11,400/-**

# Faculty Write-Up

## ISO Internal Audit

ISO internal audit of the Department was held on 30-08.2021. Dr. K. Sampathkumar & Dr. Srinivas Gumparthi Professors, SSN School of Management were the internal auditors. Dept ISO Cell consisting of Dr. A S Ramana, Dr. Anirudh Venkatraman Krishnan & Dr. Divya Zindhani Asso. Profs. supported by all Teaching & Non-Teaching faculties ensured smooth conduct of Internal audit process.

Dr. A.S. Ramana & Dr. M. Nalla Mohamed, Associate Professors of Mechanical Engg. Dept. conducted ISO internal auditing in ECE Department of our institution on 24th Aug 2021.

## Publication with part time research scholar

**"Energy Sources, Part A: Recovery, Utilization, and Environmental Effects", Taylor and Francis, with 3.447 Impact Factor**

Ashok V, Geetha N.B, Rajkumar S and Pauline T. Experimental Investigations for Thermal Energy Management by Encapsulation of Nano -Enhanced Bio Phase Change Material

in buildings, Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, 2021.
https://www.tandfonline.com/eprint/ZD9XPRXZAG32WYRIPVYX/full?target=10.1080/15567036.2021.1967517

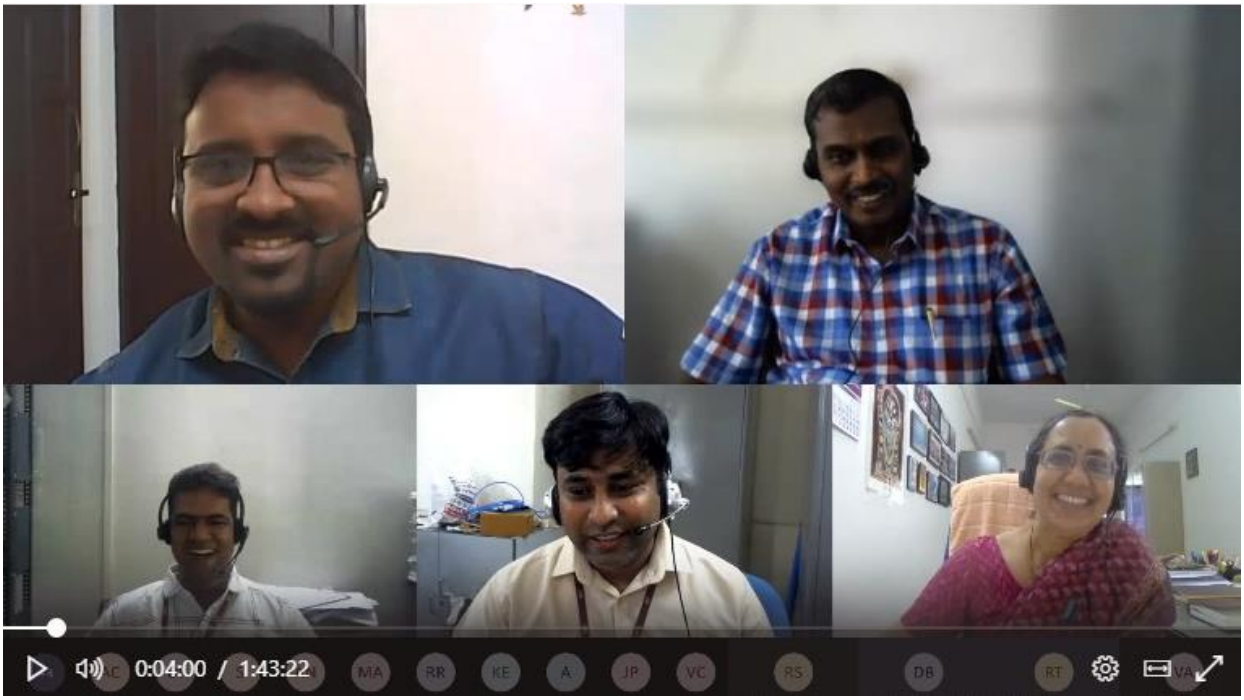
Due to the enormously increasing population in metropolitan cities of India, most of the transmissions of ozone exhausting substances are expected from metropolitans, of which the building structures may contribute significantly. To limit these levels, one of the inevitable structures of the metropolitan plan is to adopt green buildings. In this regard, integration of Nano-enhanced Bio Phase Change Material (NeBPCM) in buildings is an innovative technology that has a high potential to reduce the thermal energy penetration into the buildings. The green buildings enhance the thermal comforts inside the building with energy conservation. A novel integration of NeBPCM composite is introduced to a Solid Concrete Hollow Block of size 400 mm x 200 mm x 100 mm. The experimental building of size 1 m x 1 m x 1 m is constructed to analyze the thermal effects of this phase change material (PCM) integration within the buildings. A drop in temperature is observed in PCM integrated building from 5.3°C to 1.1°C compared to that of building without PCM. The error between the measured data and numerical predictions is found to be within the range of 0.3°C and 1.6°C. The experimental investigations also revealed a reduction in maximum room temperature up to 5.3°C in the building integrated with NeBPCM vis-à-vis building without NeBPCM. Also, NeBPCM integration in building increased the temperature by 1.8°C when the outside ambient temperature averagely dropped below 23.6°C, thus improving the thermal comfort in the buildings all over the seasons. Therefore, NeBPCM integration in buildings is advantageous in terms of maintaining the room temperature to provide passive cooling of buildings with energy savings.

## Teachers Day Cultural 2021

Dr. K.S. Vijay Sekar, Dr. R. Rajeswari and Dr. C. Arun Prakash won the II prize in the Antakshri Staff Cultural event organised by SSNCE on 06.08.2021. Dr. K.S. Vijay Sekar participated in the Tamil Pattimandram Staff Cultural event organised by SSNCE on 13.08.2021. Dr. K.S. Vijay Sekar, Associate Professor, participated in the Sing a Song - Staff Cultural event organised by SSNCE on 19.08.2021. Dr. K.S. Vijay Sekar, Associate

Professor, won the I prize in the Quiz - Staff Cultural event organised by SSNCE on 20.08.2021

Dr. Alphin M S and Dr. Vimal Sam Singh Convened Game Show for the faculty and staff on 9 Aug 2021. About 40 faculty and staff were registered for the event.





| | |
|---|---|
| C. Arun Prakash | 215 |
| Raja S | 200 |
| Manjari | 140 |
| A. Annie Christina | 140 |
| Ananda Raman | 130 |
| ANAND RONALD B | 125 |
| Aparna G | 120 |
| Dr. S.T. Jothi Basu | 105 |
| Divya Zindani | 90 |
| Dr.R.Sundareswaran | 90 |
| Sowrirajan K | 85 |
| RAMPRABHU S | 75 |
| V. Thiyagarajan | 75 |
| S.I. Davis Presley | 55 |

## Publications in Scopus

Dhananchezian, M. "Influence of variation in cutting velocity on temperature, surface finish, chip form and insert after dry turning Inconel 600 with TiAlN carbide insert." *Materials Today: Proceedings* (2021).

M. Dhananchezian, Experimental investigation on dry turned Monel 400 alloy surface parameters with uncoated and coated tool, Materials Today: Proceedings, 46 (17) 8303 - 8306.2021.

## Other Monthly Activities

Internal Funded Project Applied: Dr A S Ramana Associate Prof., Dr. P. Dhamodharan, Associate Prof. & Mr. Faris Ahmed, NDF Research Scholar submitted project titled "Design & Development of Intelligent Disease resilient Decentralized Hybrid air conditioning system for Building Applications", Budget : Rs. 1.47 Lakhs Funding Agency: SSN Trust

Internal Funded Project Applied: "Erosion Corrosion of Duplex Stainless Steel weldments", PI: Dr. B. Anand Ronald, CI: Mr. D.Ebenezer ; Funding Agency: SSN Trust - IFFP

Internal Funded Project Applied: PI: Mr. B. Jayakishan/AP/Mech; Co-PI: Dr. T. Vinoth/AP/Mech and Dr. R. Prakash/ASP/Mech Project Title: Waste to Energy: Power Generation from Urban Solid/Liquid Waste using Low Temperature Combustion Engine under Dual Fuel Mode, Total Budget:4,00,000, Funding Agency: SSN Trust

Dr A S Ramana Asso. Prof. & Dr P.Damodaran, Asst. Prof., Department of Mechanical Engineering with technical inputs from Mr Faris Ahmed, AICTE NDF Scholar submitted a project proposal titled Design and Development of Intelligent Disease Resilient Decentralized Hybrid Air Conditioning System for Building Application for Rs 1.47 Lakhs Under SSN Trust IFFP Scheme.

Dr. K. Jayakumar, Associate Professor presented a paper entitled "Experimental studies on surface roughness and temperature rise during end milling of al 7075" in the two days International Conference on Energy and Materials Technologies-ICEMT

2021 (Online) organized by the Department of Mechanical Engineering Sri Sivasubramaniya Nadar College of Engineering, Chennai during August 20-21, 2021. Co-authors are: PJ. Abdul rahman, L. Manikandan, N. Aravinth, and A. Karthikeyan (UG Students).

Dr. K. Jayakumar, Associate Professor presented a paper entitled "Effect of grinding parameter and coolants on grindability of titanium alloy" in the two days International Conference on Energy and Materials Technologies-ICEMT 2021 (Online) organized by the Department of Mechanical Engineering Sri Sivasubramaniya Nadar College of Engineering, Chennai during August 20-21, 2021.

Dr. M. Dhananchezian, Associate Professor, participated Two-weeks Faculty Development Programme (FDP) on "Manufacturing Technology Research and Management" organized by Aliah University, Kolkata from 02.08.2021 - 14.08.2021.

Dr.K.S.Vijay Sekar, Associate Professor, attended an Online FDP on " Artificial intelligence in Modern Manufacturing" organised by Karunya Institute of Technology and Sciences, Coimbatore, Tamilnadu from 03.08.2021 to 07.08.2021

Dr. Alphin M S, Convened Public Viva Voce for the Full time scholar Mr. Raja S on 20 Aug 2021. Dr Anil Kumar, Professor and Dean, IIT Tirupati and Dr. Jayavel, IIITDM were the external examiners.

Dr. K.S. Vijay Sekar, Associate Professor has attended an online workshop on " Hindrances faced by Entrepreneurs" delivered by Dr.K.Murugesan, EEE, organised by SSN-IIC cell on 28.08.2021

Dr. K.S. Vijay Sekar, Associate Professor has attended a webinar on " Make a difference to make a living" delivered by Mr. Aashik Goel, SSN- IT dept. Alumni, under the Extra mural lecture series on 28.08.2021

Dr. A S Ramana, Asso. Prof., Dept. of Mech. Engg. was invited for Online DC meeting of Research Scholar by Dr. B. VijayaRamnath, Prof. & Head, Dept of Mechanical Engg., Sri Sai Ram Engg. College, Chennai on 26.08.2021.

## Non-Teaching Staff Activities

R.Subramani Lab-Assistant completed course Microsoft word 2010 revised 2017 in Alison on (20/08/2021)

Mr. BalaSundaram P / Lab Assistant / Mech. / Attended One Day International Conference of Energy And Materials Technology Dated: 18/08/2021., Conveners: Dr. N. Lakshmi Narasimhan & Dr. K. Rajkumar ICEMT 2021.

P.Nandakumar /Turner Grade II/Mech Completed on line course Introduction to Microsoft PowerPoint 2019.

P.Nandakumar /Turner Grade II /Mech Involved in admission duty for counselling interview for Rural School Toppers on Monday the 23rd August 2021 at CDC

Nagarajan S, Lab Instructor, Department of Mechanical Engineering completed the online course "Diploma in Engineering Drawing and Computer Graphics" on Alison on 25/08/2021.

Nagarajan S, Lab Instructor, Department of Mechanical Engineering participated in Global HR Conclave on "Reskill and Upskill Capabilities of Leaders of Tomorrow," on 12th August, 2021, organized by SSN School of Management, Chennai, in association with HR Shapers.

Nagarajan S, Lab Instructor, Department of Mechanical Engineering attended the International Conference on "Energy and Materials Technologies (ICEMT 2021)" Organized by Department of Mechanical Engineering, Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam on Aug 20, 2021.

Nagarajan S, Lab Instructor, Department of Mechanical Engineering participated in the International Webinar on "Smart Transit Stations in a Smart City" delivered by Mr. Robert Versteeg, Consultant at Smart City Consultants, Amsterdam, the Netherlands organized by the Department of Civil Engineering, Sri Venkateswara College of Engineering on 26th August 2021.

# Student Write-Up

## Student Activities

| S.no | Date | Activity done during the month |
|---|---|---|
| | | THIRD YEAR |
| 1) | 11/8/2021 | **VARSHINI A** ***3rd year***.<br>• Virtual industrial visit which was held by Dow Chemicals. |
| 2) | 21/8/2021 | **SURESH BABU R**, ***3rd Year***<br>• Skill training (Robotics elements and Architecture) |
| 3) | 21/8/2021 | **DAMMALA SHANMUKA ABHIRAM**,***3rd Year***<br>• NPTEL - 12week course - Elements of solar energy conversion |
| 4) | 21/8/2021 | **R SHYAM SUNDAR**,***3rd Year***<br>• Training at EQuad Engineering Services |
| 5) | 21/8/2021 | **RONAK BAGMAR, A**,***3rd year***<br>• Core Industrial Training and Internship by "EQuad Engineering Services Pvt Ltd. |
| | | FINAL YEAR |
| 1) | 13/08/2021 | **VARUNA G R**,***4th year***<br>• Internship at Dow Chemicals |
| 2) | 28/09/2021 | **ANUSHKA PRASAD**, ***4th year,***<br>• Summer Internship at Saint Gobain |
| 3) | 31/08/2021 | **GUNDEPUDI V SURYA SASHANK**, ***4th year***,<br>• Online Course<br>1.PH125.5x: Data Science: Productivity tools from HarvardX<br>2. PH125.4x: Data Science: Inference from HarvardX<br>3. PH125.3x: Data Science: Probability from HarvardX<br>4. PH125.2x: Data Science: Visualization from HarvardX<br>• Session organizer for ICEMT 2021. |
| 4) | 18/08/2021 | **THARUN VS**, ***4th year,***<br>• Internship at Hawashin Automotives India Private Limited |
| 5) | 21/08/2021 | **SHOBA E**,***4th year,***<br>• Session organizer for ICEMT 2021 |

| | | |
|---|---|---|
| 6) | 21/08/2021 | **A SABAREESH**,***4th year***<br>• Volunteer for ICEMT 2021 |
| 7) | 21/08/2021 | **GOUTHAM KRISHNAN U S**,***4th year***<br>• Session organizer for ICEMT 2021<br>Surya Prakash S, 4th year,<br>• Session Organizer during the International Conference on Energy and Materials Technology |
| 8) | 21/08/2021 | **AKASH S**,***4th year***<br>• Session Organizer of International Conference of Energy and Materials Technology |
| 9) | 17/08/2021 | **GAUTHAM RANJIT**,***4th year***<br>• Placement at Thorogood Associates |
| 10) | 22/08/2021 | **HARIHARAN V S**,***4th year***<br>• NPTEL Course Operational Management |

## *Shyam Sundar,III-Year, writes....*


Government of India

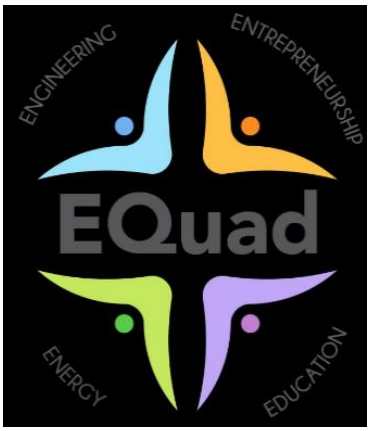
Ministry of Micro, Small & Medium Enterprises

MSME - TECHNOLOGY DEVELOPMENT CENTRE, CHENNAI (CFTI)

Certificate

Shyam Sundar R

Robotics Element and Architecture




This is Shyam Sundar, pursuing third year in Mechanical engineering.

I recently attended the Training at EQuad Engineering Services. It is a government funded training (MSME). The training took place for a week in Perungudi.

I underwent the training in "Robotics Element and Architecture" from 16th to 21st August. I came across this in 2nd year and registered. Next, they called for training by the engineers who graduated in 2018. Initially, we were taught in a classroom and later they showed the workings of the model and we started doing hands-on.

I learnt about the mechanics and Electrical side of robotics, in which the former deals with the mechanism of working and the latter deals with the basic code to run the robot.

It was a good experience and informative. I got an overall idea of how the Robots function.

## Varuna.G , IV year, writes...

**Dow Chemicals Internship Selection Process:** Dow Chemicals Internship selection process was very neatly and systematically arranged virtual process. It started off with an Induction session which started at 10:00am in the morning of 15th February 2021 and ended at 11:00am, where we got to know about the company much better, like the products they manufactured, their values and so on.

1)Around 11:30 am, we had a technical aptitude test, which tested our technical knowledge, in which the questions came from Fluid Mechanics, Thermodynamics, EG, Strength of Materials.

2) Around 1:00pm, we had our group discussion in which the topics were more relevant to the present times- 'Virtual learning vs Conventional learning' and 'Is technology making us less human'.

After this, we went on a lunch break, where the panel took time to shortlist the candidates based on the performance in the aptitude and the GD.

3)The PI for me started from 8:00pm, which lasted up to 8:30 pm, where the questions mostly dealt with what we had put on our resume. So, building up a good resume is more important. Since I had put Fluid Mechanics and Strength of Materials as my areas of interest, most questions were asked from that and some questions from my resume too.

4) After further shortlisting, the final HR round took place on 19th February 2021, four days after the previous three rounds. They asked some basic questions like

- Where do you see yourself 5 years from now?
- Why did you opt for Mechanical Engineering?

And so on and so forth.

In short if I had to sum up, it was totally a new experience and the exposure was phenomenal. The interview panel, the HR were all comfortable, so that at any point we did not feel as if we were just third year students who were seeking an internship. We were treated with due respect and they honoured our queries calmly.

**Dow Chemicals Internship experience:**

The internship started from June 3, 2021 to Aug 13, 2021. I was assigned the role of Piping Materials Engineer, wherein I worked on 2 projects. My role in the internship process was to create a specification which had all the components required to lay a pipeline system. It also contains the dimensions of the components. To put in simpler words, it was more like a bill of materials. I was also asked to know the workprocess of the overall Piping discipline and where do I stand in it. They had also conducted various sessions in which we got to know about the different disciplines that come together for the smooth operation of the plant.

Dow made sure that we feel comfortable through all the stages by conducting a virtual talent show, wherein we displayed our talents. The major motto that they follow is the safety. Inclusion is their goal. Diversity is their vision. They work towards gender equality at any cost.

In a nutshell, this internship made me technically sound as well as developed my soft skills and working with such a massive organization gives me pleasure.

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## *Muhilan S, IV-year, writes ...*

My name is Muhilan, pursuing final year in Mechanical Engineering department. I recently took the GRE examination in the month of July.

**Preparation:** Students can opt to either prepare by themselves at home with the help of various books and online GRE portals or enrol into any institute to get a complete overview and the idea of GRE through the faculty who would be taking classes for each subject.

**Pattern**: There are 3 types of sections, namely:

1. Analytical Writing Assessment (AWA), (0-6 marks, with 0.5 increments)
2. Verbal Reasoning. (130-170 marks)
3. Quantitative Reasoning. (130-170 marks)

The exam is for a total of approximately 4 hours with a 10-minute break in between. The exam consists of total 6 sections:

- The first section is the AWA, where you will be given an Issue and an Argument to compose your answer on. In the issue task, you are provided with a topic/statement in which you must take a stance, as to whether you agree or disagree with the statement presented above. The argument task would provide you a memo or an argument, in which you would have to pick out flaws that the argument presented above contains and construct a well written response using those flaws and stating how can these flaws be supported to make them meaningful. Timing for each task is 30 minutes
- The other 5 sections consist of either 3 verbal and 2 quants or 2 verbal and 3 quants. Verbal sections have 20 questions for 30 minutes and quants section have 20 questions

for 35 minutes. One out of these 5 sections are unscored, which means that it won't be evaluated for your final score, and we will not be knowing which section it is.

**Preparation tips**: When it comes to preparation, there are a few things to keep in mind:

1. Initially, go through the syllabus of GRE in both verbal and quants.
2. For **quants**, go through each concept one at a time, and once you finish a concept, try all the variety of sums, not all the questions as a whole. This helps you to cover each type of sum that can be asked under that topic and leave some questions for you to practice later when you are preparing all the topics at once. Secondly, prepare a formula sheet for quick reference, and note down points that you might need to remember. Next, start practicing quants for about 1-1.5 hours a day, and make sure you cover sums from all topics, for example, 5 sums from each topic per day.
3. For **verbal,** there are various types of questions, like passage questions, fill in the blanks, critical reasoning and fill a blank with two words that give the same meaning to the sentence. Verbal requires a lot of vocabulary, so spend 1 hour every day to learn new words and try forming sentences using those words to remember them.
    - For passage questions, first try reading the questions, and then try to find the location of where the answer might be found. No answer is direct, so you will have to read, infer, and conclude the answer using the context of the passage and the given options.
    - For critical reasoning questions, you will have to find the best answer out of the options that would satisfy the statement given.
    - Fill in the blank questions mostly depend on whether you are able to understand the tone in which the sentence is given, and most importantly tests your vocabulary. Practice these kinds of questions for about 1-1.5 hours a day.
4. For AWA, try taking various topics and write on them. Use international examples to strengthen your AWA. Try to write about 450-600 words.
5. Once you feel confident, go for Full Length tests. Once you complete a test, never forget to review your answers from the test. It is very important as that is what is going to help you to improve in the areas where you need work on. Take 2 tests per week as the examination date approaches. Try to take as many tests as possible.
6. Do all your practice on your computer as the final exam is a computer-based exam, so it would be helpful for you to get used to it.
7. One day before the exam, do not take a test or read anything, just relax, and take good rest.

The difficulty of the final exam roughly is close enough to the 2 free mock exams that the ETS website provides, but do not entirely depend on it as you cannot predict what you would get in the exam. So, prepare to your very best. **Expect the unexpected.**

Good luck to all you guys who are going to take up the test. Hope these points help you to score well.

## G V Surya Sashank, IV-year, writes...

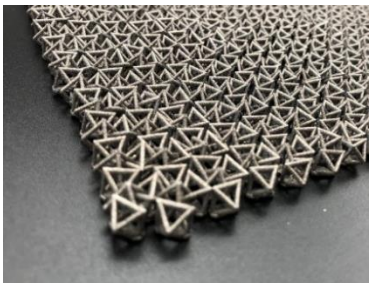
I am G.V Surya Sashank from Mechanical final year. When SSN College of Engineering sponsored courses on the online course platform Coursera I was rather skeptical about this method of learning. However, looking at the plethora of information and knowledge which was at my disposal I tried one of the courses and I had discovered a way which helped me learn and access knowledge in a way that was efficient for me. Following the sponsorship from coursera, SSN College of Engineering sponsored a few courses on the edX platform from where I learnt some of the basics of R programming and data science. I completed 4 courses during the month of August, from Harvard University. The online platform edX really helped me learn more at my own pace and with the community from around the world helping me at every step, I didn't feel alone or lost at any point during my journey.

The courses majorly revolved around Data Visualization, Modelling and a few Productivity tools while taking up a new data science project. Each course was new, and the instructors covered the topics using interesting case studies like: Trends in World Health and Economics, US Crime Rates, The Financial Crisis of 2007-2008 and Election Forecasting. With the R programming language, I was able to simulate experiments using probability theory, visualize them using multi-layered plots, derive inferences from the same using models and finally share the results with tools like git and GitHub.

These courses have opened a new avenue for me to explore and I am thankful for SSN College of Engineering for introducing me to the R Programming language and RStudio Environment.

# Mech Marvel

## Tough, Yet Flexible – A Next Gen Smart Fabric



Materials that change their properties in response to certain stimuli could come to occupy a valuable space in many fields, ranging from robotics to medical care, to defence. A new example of this, developed by scientists at Singapore's Nanyang Technological University and Caltech in the US is modelled on ancient chain mail armour, enabling it to swiftly switch from flexible to stiff thanks to carefully arranged interlocking particles. This behaviour is enabled by a concept called jamming transition. Think about coffee in a vacuum-sealed bag. When still packed, it is solid. But as soon as the bag is opened, the coffee grounds are no longer jammed against each other, and it can be poured as though they were a fluid. The team designed several configurations of linked particles, from linking rings to linking cubes to linking octahedrons. The materials were 3-D printed out of polymers and even metals with the help of NASA's Jet Propulsion Lab. In testing, a vacuum-locked chain mail fabric was able to support a load of 1.5 kilograms, more than 50 times the fabrics' own weight. The team is now working to improve performance, and is investigating new ways it might be stiffened, with magnetism, temperature, and electricity among the possibilities. This video shows it in action. The study was published in the journal Nature.

# Corporate Story

## Marut Drones


What started off as a solution to the mosquito menace in the localities of Hyderabad is now one of India's most exciting drone tech start-ups. Marut Drones was co-founded in March 2019 by Prem Kumar and his batchmates from IIT Guwahati. Since its inception, the start-up has been attempting to solve multiple problems by applying data analytics, IoT, AI and machine learning.

Their product Marut ZAP, became India's first comprehensive solution involving mosquito surveillance, effective interventions and awareness campaigns based on emerging tech and data-based disease prediction. Currently, they are working in four key areas – gathering data on mosquitoes and mosquito-borne diseases, afforestation, agriculture, and medicine. They are also authorised as a R&D organisation by the Ministry of Civil Aviation, a boost for a company whose bright prospects are sure to touch more lives through their socially sustainable solutions. If you're interested and would like to know more, do check out their Website and LinkedIn for info and job openings.

# Amazing Innovation 199

## Nature Inspired Bioglue To Save Lives

Researchers at Massachusetts Institute of Technology (MIT) have designed a strong, biocompatible glue that can seal injured tissues and stop bleeding, inspired by a super strong underwater adhesive used by Barnacles. The new paste can adhere to surfaces even when they are covered with blood and form a tight seal within about 15-30 seconds of application.

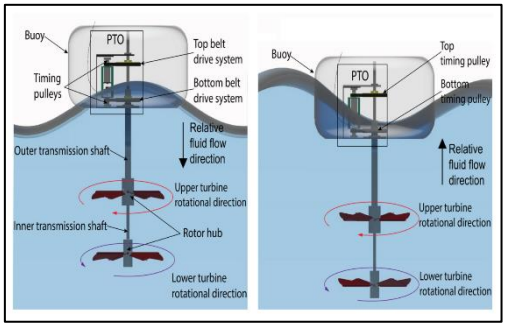
Hemostatic agents used now in surgery don't always work in conditions where there is too much bleeding. The team turned to nature for inspiration. Barnacles are marine creatures that firmly adhere to all kinds of surfaces by secreting certain bio-substances. They took this concept and applied it to existing medical adhesives.

Lab testing has led to positive results. They aim to test it on larger wounds and eventually in the longer run, make it a feasible option for first responders and surgeons to use in saving lives.

**Sources**: Journal – Nature Biomedical Engineering. Detailed Article - Genengnews.

# Amazing Innovation 200

## Taming Wave Energy




The untapped potential of ocean wave energy is vast – it is estimated that the power of coastal waves around the world each year is equivalent to annual global electricity production. A research team led by RMIT University in Australia has created a wave energy converter that is twice as efficient at harvesting power as any similar technologies developed to date. It is based on a world first, dual turbine design. Unlike some popular experimental approaches to harness wave energy, which requires the device to move in sync with waves for max efficiency; The RMIT-created prototype needs no special synching tech, as the device naturally floats up and down with the swell of the wave. This simple and economic prototype has been successfully tested at lab scale and the research team is keen to collaborate with industry partners to test a full-scale model, and work towards commercial viability.

**Sources:** Journal – Applied Energy. Detailed Article - NewAtlas.

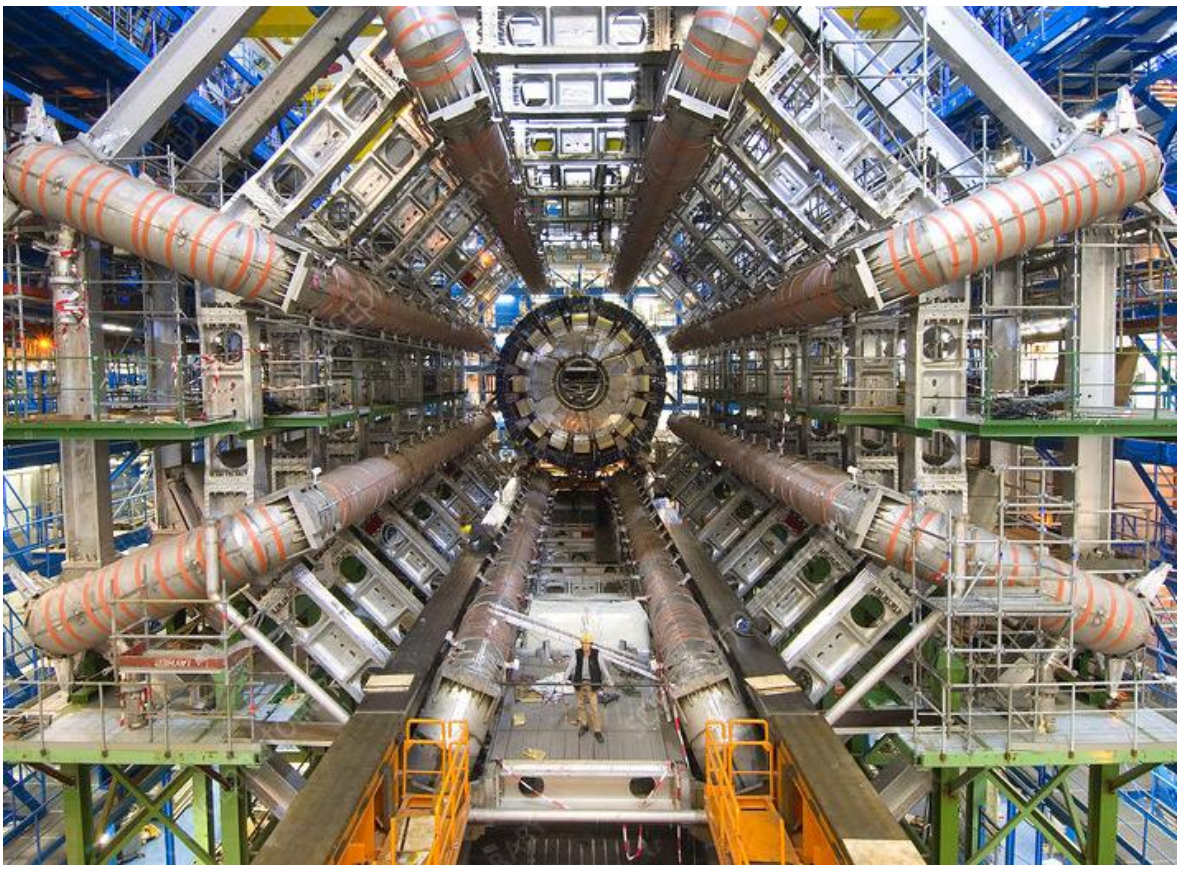
# Alumni Write-Up

## Diwakar's aspiring research journey


*Diwakar Suresh Babu, our department alumnus (2018 batch) is about to pursue his PhD at the prestigious Helmholtz Institute for Materials and Energy. Today, he shares with us his fascinating works ranging from carcinogens to setting the world-record in solar to hydrogen conversion efficiency!*

I am elated to share my career update after graduating from SSN which served as an impetus to explore the Nanoworld. In February 2021, I graduated 'cum laude' from TU Delft with a Masters in Materials Science and Engineering, specializing in Nanotechnology. During my thesis, I worked on the advanced anodic oxidation of PFAS, commonly called as "forever chemicals" which causes cancer in humans at a very young age and are present in the blood of almost every single human being on earth. With achieving 100% degradation efficiency using boron-doped diamond electrodes, our research article is currently under review in Q1 journal.

One of the greatest moments in my life is to witness the Large Hadron Collider and a 27 km ring of superconducting magnets at CERN where the particles that make up everything around us are being studied.



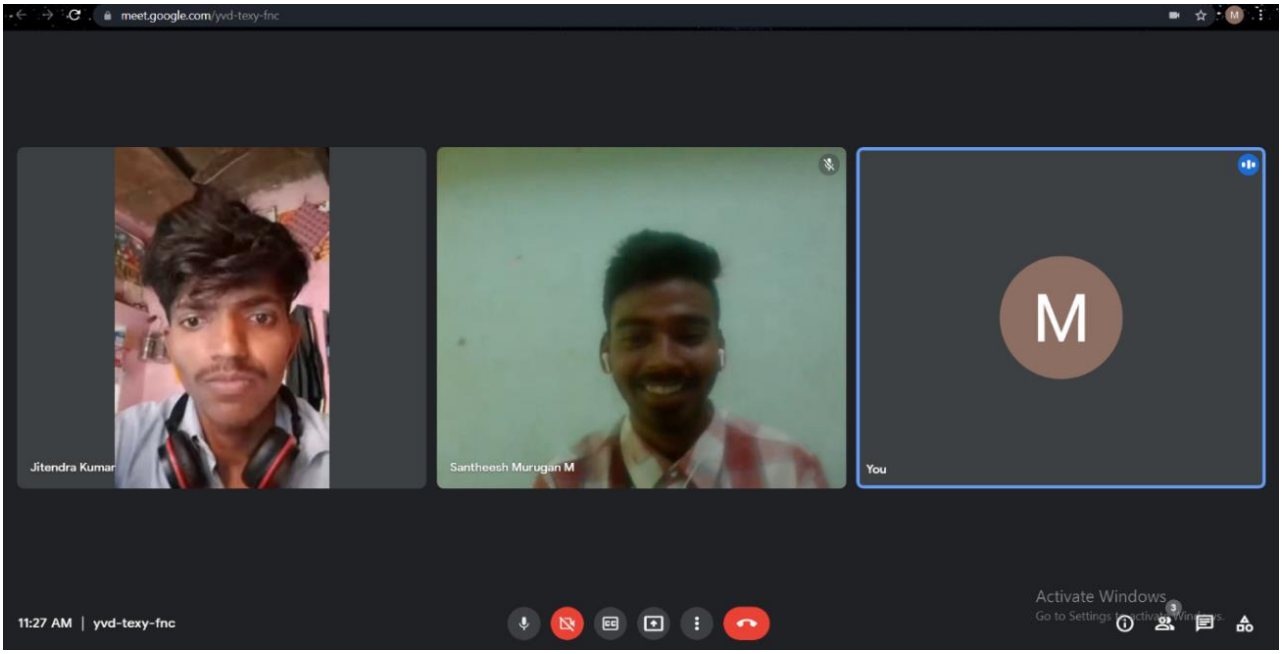
With increasing concerns over the climate change and an immediate need to attain sustainability, I decided to pursue my PhD at the Helmholtz Institute for Materials and Energy, Berlin, Germany. From the 1st of September, I will be working on the Atomic Layer Deposition (ALD) of protective layers in III-V semiconductors for water-splitting photoelectrodes. The photoelectrodes produce green hydrogen through direct solar water-splitting. I will be using the particle accelerator (synchrotron) situated at Helmholtz to characterize materials using extremely bright X-rays produced by electrons travelling at the speed of light. My research is a part of the joint project "H2Demo" funded by the German Federal Ministry of Education and Research with 14 million euros to demonstrate large scale water-splitting. Our project partners currently hold the world-record efficiency of solar to hydrogen conversion (19%) and one of my goals would be to surpass the 19% efficiency. With the attained research experience in the upcoming years, I aim move back to India with an interest to initiate a multi-partnered research institute focusing on Nanotech similar to CeNSE at IISC.

Diwakar Suresh Babu

2018 batch

# Alumni association activity

**Name of the event:** Mock placement interview by alumni association of mechanical department
**Date(s) of the event:** 28th August 2021
**Number of persons attending:** 25
**Faculty Coordinator:** Dr.C.Arun Prakash
**Student Coordinators**: Biju, Mohanraj, A Sabareesh. Sricharan
**Mechanical department alumni**: Jitendra kumar, Mahalakshmi, Dheepak R, Karan (from Core companies); Vignesh M,Karthik (from IT companies)




On 28th August, the mechanical department alumni association organized a mock placement interview session with assistance from 2020 batch alumni. The activity was aimed at providing students with an emulated environment to help assess and improve their interview skills. Such an event was wanting as many students find the interview stage to be intimidating.

Prior to the event, the students' resumes were collected and scrutinised by the alumni to direct the event in semblance to an actual online placement interview. Also, their choice of Core and IT companies in campus were obtained. On the event day a formal ambience was established with the students being briefed about the modalities of the interview.

Once the prelude was complete, the students were led to their respective breakout rooms as per their scheduled time slot to experience a one-on-one interview

with the HR manager from the respective companies. The alumni started off with a few general questions, to loosen up the candidate and went on to pose questions testing their technical knowledge. At the end of the interview, the convenors provided constructive feedback to the students to help rectify their shortcomings, throwing light on areas that needed attention specific to each candidate. Following this, the breakout rooms were closed and the alumni general feedback. Some of such suggestions were:

- Students were learned in technical aspects but revision on a few concepts were called for
- Apart from their interested fields, it is required for the candidates to possess a general knowledge about all their subjects
- It is crucial to answer with a clear, bold reply
- Candidates should know their resume in and out (including detailed awareness about in-plant trainings and internships) and skills that are poorly known are better off removed
- Regarding the project, applicants should be able to explain their work and their specific areas of interest in the project
- During the interview, the students should manage to explain how their interests and work could benefit the company if they were hired

The students expressed their gratitude to the alumni for providing a beneficial experience to help tackle their future endeavours. They felt such mock interview sessions were necessary for the upcoming batches, well equipping them to ace the interview milestone of their placement journey.

*"The interview was very informative, and the alumni were really friendly. It gave a glimpse of how a technical interview would be and how to prepare for it. This event makes me feel quite confident about the future interviews that I would attend."*

-Participant

Finally, the event concluded with well wishes from the alumni; they were delighted to witness the student turnout to the session and hoped that the session was useful in helping the attendees adapt to oncoming challenges.

# Research news & Forthcoming events

**Department of Health and Human Services**

National Institutes of Health BRAIN Initiative: Pilot resources for brain cell type-specific access and manipulation across vertebrate species
(U01 Clinical Trial Not Allowed)

93.173 – Research Related to Deafness and Communication Disorders
93.213 – Research and Training in Complementary and Integrative Health
93.242 – Mental Health Research Grants
93.273 – Alcohol Research Programs
93.279 - Drug Abuse and Addiction Research Programs
93.286 – Discovery and Applied Research for Technological Innovations to Improve Human Health
93.853 – Extramural Research Programs in the Neurosciences and Neurological Disorders
93.865 – Child Health and Human Development Extramural Research
93.866 – Aging Research
93.867 – Vision Research

Last date for submission of the project proposal: **19-Oct-2021**
https://www.grants.gov/web/grants/search-grants.html
NIAID Research Education Program (R25 Clinical Trial Not Allowed)

**Allergy and Infectious Diseases Research**

Last date for submission of the project proposal: **07-Dec-22**
https://www.grants.gov/web/grants/search-grants.html

WTI Call 2021 on Desalination Technologies
Last date for submission of the project proposal: **September 16, 2021**
WTI Call 2021 on Desalination Technologies | Department Of Science & Technology (dst.gov.in)

# Students Events

**5 Days Workshop on 3D Printing and Scanning**
Rajalakshmi Engineering College, Workshop, Chennai, Tamil Nadu
6th - 10th September 2021
https://www.knowafest.com/college-fests/events

**2nd International Conference on Waste, Energy and Environment 2021 (International Conference)**
Sathyabama Institute of Science and Technology, Chennai, Tamil Nadu
23rd - 24th September 2021
http://www.icwee2018.com/2021/

**Applications open for Joint Admission Test for Masters (JAM 2022)**
For M.Sc. (Two-year), Joint M.Sc.-Ph.D., M.Sc.-Ph.D. Dual Degree, and other Post-Bachelor's Degree Programs at IITs
**Last date to apply – 11th October 2021**
Exam – 13th February 2022
https://jam.iitr.ac.in/index.html

**Applications open for Graduate Aptitude Test in Engineering (GATE 2022)**
**Last date to apply – 24th September 2021**
Exam – 1st and 2nd Weeks of February 2022
https://gate.iitkgp.ac.in/

**Global AI Student Conference (International Conference)**
16 October 2021 from 15:30 till 23:30
UTC+05:30 Asia/Calcutta
https://aiconf.education/

## Conference with Scopus Publication

**CIMS 2021**

2ND INTERNATIONAL CONFERENCE ON INDUSTRIAL AND MANUFACTURING SYSTEMS

11TH-13TH NOVEMBER, 2021 **(IN HYBRID MODE)**

JOINTLY ORGANIZED BY:

DEPARTMENT OF PRODUCTION AND INDUSTRIAL ENGINEERING, PUNJAB ENGINEERING COLLEGE, CHANDIGARH

&

DEPARTMENT OF INDUSTRIAL AND PRODUCTION ENGINEERING, DR. B. R. AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY JALANDHAR

IN ASSOCIATION WITH:

THAPAR INSTITUTE OF ENGINEERING & TECHNOLOGY, PATIALA & INDIRA GANDHI DELHI TECHNICAL UNIVERSITY FOR WOMEN, DELHI

Selected Papers of the CIMS-2021 will be considered for publication in the special issues of **Scopus Indexed Journals/Proceedinbgs in Scopus Indexed Series** by reputed publishers like Springer/ Taylor & Francis (CRC-Press)/Wiley.

Conference website: https://pec.ac.in/cims-2021/

Important Dates

| | |
|---|---|
| Last date of full paper submission: | 10th September 2021 |
| Acceptance of full paper: | 17th September 2021 |
| Last date of Registration: | 10th October 2021 |

**16-17 November 2021 ICAMS 2021 Ahmednagar, India**

Accepted papers will be published in **Key Engineering Materials** (ISSN Print 10139826; Web 1662-9795) Trans Tech Publications Switzerland, indexed in various databases such as, **SCOPUS, Chemical Abstracts Service, Google Scholar, CSA,** etc

## International Conference on Advances in Material Science 2021

Second International Conference on Advances in Material Science (ICAMS) 2021 is organized by Technology Research and Innovation Centre, India in association with Dr. Vithalrao Vikhe Patil College of Engineering, Ahmednagar, India and IEEE Nanotechnology Council Chapter, South Africa on 16-17 November, 2021. ICAMS 2021 .

# Inspiring Life Stories


## Prometheus and the Two Roads

In the olden days, the Greeks believed Zeus to be the King of all Gods and Prometheus, the God who made man.

One day, Zeus called Prometheus and said, "I command you, Prometheus, to show all human beings the way of freedom and the way of slavery."

Prometheus said, "The way to freedom will be rough in the beginning, with many blocks and steep climbs. There would be no water to drink. There would be no pathways, only thorns. And there would be dangers on all sides. But the road would become a smooth plain. There will be fruit trees and streams on both sides of the path. The difficulty will end. People will be able to rest. They will reach freedom."

Prometheus then added, "The way of slavery will start out as a smooth plain in the beginning. The pathway will be full of beautiful flowers and very -comfortable; just the opposite to the road leading to freedom. But later there will be only blocks, steep climbs and difficulty on all sides."

"Good things in life do not come easy."

Source: Prometheus and the Two Roads | Short Stories (shortstoriesshort.com)

Pic Source: YouTube

# Corporate Wisdom

## From the desk of Ramki -– Aspire to Inspire

### *Happy Morning*

Think of a notebook with several pages. Each page is just an open page. It is up to us to either scribble on it or write poetry on it. Irrespective of what we do with the page, we can still turn to the next page. Once again, we have the choice of either scribbling on it or writing poetry on this new page. Till the notebook ends, the freedom of choice to use or abuse the pages of the notebook purely rests with us. More importantly, even if we have wasted the

first half of the notebook with just scribbling, we can still write poetries after poetries in the second half of the notebook and make the notebook worth preserving.

Metaphorically, the notebook can be compared with our life and each open page in it to a day in our life. The dawn of every day offers you the choice of using or abusing the day. Till you embrace death, the freedom of choice to use or abuse the days of your life purely rests with you. Whatever be our age, as worst-case scenario, even if you have wasted the entire past of our life, you can still make a beginning, starting today.

- The past is irrelevant.
- We cannot undo the past.
- There is no ctrl+Z options in life. So, let it go.
- Draw a line to the past.
- The present forms the building blocks to our future.
- Begin from where we can begin and that is now.
- Start now. Use our present to build our future.
- Our future is yet to be and it begins from today,

We can make the most of every day of our life from now on and create a life that will be cherished. It is never late to begin. It is never too late to get awakened in life. Our future begins now. Move with this confidence and we can make a difference in our life.

**Life is not about finding yourself, Life is about Creating yourself**

#WishingMostAndMore

Have a wonderful day

R. Ramakrishnan

Email: *r.ramakrishnan@gmrgroup.in*

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