



**DEPARTMENT OF MECHANICAL ENGINEERING**



# **TECHNICAL MAGAZINES**

# **MECHZINES**

# **2018 – 2019**

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## CHAIRMAN MESSAGE

Education builds a bridge between ignorance and wisdom. Sri Shanmugha College of Engineering and Technology has been established with fulfilling such an objective. It is an undeniable fact that education always serves the purpose of enlightening the rural mass with showing the light of knowledge and wisdom towards the path of success. This aspiration has paved the primary base for the emergence of Sri Shanmugha College of Engineering and Technology, which, in fact, disseminates knowledge through innovative teaching learning practices and industry connect endeavors. As the Founder-Chairman, I am highly privileged that Sri Shanmugha campus functions as an instrument for making potential engineers with human ethics, who are absolutely the masterminds of building our nation.



**Shri. K. Shanmugham**

*Chairman*

*Sri Shanmugha College of Engineering and Technology*

*Sankari – 637304*

*Email: [chairman@shanmugha.edu.in](mailto:chairman@shanmugha.edu.in)*

## PRINCIPAL MESSAGE

It is a great joy for me to witness the rapid progress of this college within a short span of time. Sri Shanmugha College of Engineering and Technology is known for providing eco-friendly atmosphere, disciplined culture and techno-campus with using modern teaching-learning methods and effective training and placement records. I am constantly inspired by the management, which pays close attention to ensure quality and growth of the institution and faculty, who strive hard to monitor, mentor, appreciate and encourage each and every student to overcome their shortcomings and excel in their academic as well as personal life. In turn, our students are determined and committed towards achieving their goals.

Focus of our educational endeavors lies in the following steps: a) making educational experience meaningful and enjoyable, b) entrenching positive and never-give-up spirit in the hearts of every student, c) quenching the creative thirst of the learners, d) offering co-curricular and extra-curricular activities for discovering and developing the hidden talents, e) creating an environment for shaping their leadership, entrepreneurship, professional and aptitude skills and f) preparing the learners to face the real world challenges. Thus, we are able to offer holistic learning experience for making the learners become not only brilliant but also good human beings.

As our predecessors, I am very much sure that we will continue this journey in the years to come by producing both intellectually and emotionally sound generation.

*I welcome you all to have a fruitful learning experience at Sri Shanmugha.*

**Dr. R. Radhakrishnan**

**Principal, Sri Shanmugha College of Engineering and Technology**

**Sankari – 637304 Email: [principal@shanmugha.edu.in](mailto:principal@shanmugha.edu.in)**



## COLLEGE MOTTO



## ABOUT THE INSTITUTION

Sri Shanmugha College of Engineering and Technology is a premier institution which makes quality education possible even to the downtrodden in the locale. The college was established under the aegis of Sri Shanmugha Educational and Charitable Trust by the industrialist and philanthropist, Shri. K. Shanmugham in the year 2011. Sri Shanmugha is located in an extensive campus of about 100 acres on the state highway connecting Sankari and Tiruchengode. It is accredited with NAAC & NBA (ECE), approved by AICTE, New Delhi and affiliated to Anna University, Chennai. The college functions with a motto of connecting life and learning.

The curriculum is disseminated using effective teaching-learning methods based on the current trends in the corporates. It is an ever unique feature that Sri Shanmugha is very particular about imparting quality education to produce the best human resources across the globe. It caters to the need of economically poor and downtrodden families in a way of imparting quality education in the fields of engineering and technology.

Sri Shanmugha fulfills the service of rendering education with state-of-the-art ambiance, modern laboratories, well-qualified and experienced faculty members, updated lesson plans and teaching methodologies, smart classrooms, audio-video lectures, entrepreneurship development programmes and industry connect exposure activities. The campus is fully furnished with all necessary facilities as per the requirement of accreditation and approval organizations in order to create a conducive atmosphere of learning.

## INSTITUTION VISION

**To be an Institute of repute in the field of Engineering and Technology by implementing the best educational practices akin to global standards for fostering domain knowledge and developing research attitude among students to make them globally competent**

## INSTITUTION MISSION

- M1: Achieving excellence in Teaching Learning process using state of the art resources.**
- M2: Extending opportunity to upgrade faculty knowledge and skills.**
- M3: Implementing best student training practices for requirements of Industrial scenario of the State.**
- M4: Motivating faculty and students in research activity for real-time application.**

## ABOUT THE DEPARTMENT

Mechanical engineers are constantly pushing the boundaries of what is physically possible in order to produce safer, cheaper, and more efficient machines and mechanical systems. Huge opportunities exist for mechanical engineers and they are being employed in nearly every industry. The department of Mechanical Engineering was established in the year 2011. The department is well poised to shape the students to become highly motivated Scientists, engineers, entrepreneurs, & policy makers needed to address complex societal issues

- The Department offers Under Graduate program in Mechanical Engineering leading to B.E. The department strives to enhance student interests in advances in mechanical engineering, and impart high quality education through well-qualified & highly motivated faculty team, well- equipped laboratories, and instructional facilities.
- The department underscores the importance of recognizing that mechanical engineering education must be coupled with modern industry with practices giving hands-on opportunity for every student to relate theory with practice.
- The department's all around sound performance in every sphere of academic activity has a well enough proof that it is student focused.

## DEPARTMENT VISION

- To prepare competent Mechanical Engineers capable of working in an interdisciplinary environment contributing to society through innovation, leadership and entrepreneurship.

## DEPARTMENT MISSION

- To offer quality education, which enables them in professional practice and career.
- To provide learning opportunities in the state-of-the-art research facilities to create, Interpret, apply and disseminate knowledge in their profession
- To prepare the students as professional engineers in the society with an awareness of Environmental and ethical values

### PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- To prepare students to take up career in Industry, Academia as well as in Public service.
- To provide core domain and interpersonal skills to design & develop mechanical systems for interdisciplinary applications following ethical code.
- To develop qualities to progress in entrepreneurship and research activities.

### PROGRAM OUTCOMES (POs)

<b>PO1</b>	<b>Engineering knowledge</b>	<b>PO2</b>	<b>Problem analysis</b>
<b>PO3</b>	<b>Design/development of solutions</b>	<b>PO4</b>	<b>Conduct investigations of complex problems</b>
<b>PO5</b>	<b>Modern tool usage</b>	<b>PO6</b>	<b>The engineer and society</b>
<b>PO7</b>	<b>Environment and sustainability</b>	<b>PO8</b>	<b>Ethics</b>
<b>PO9</b>	<b>Individual and team work</b>	<b>PO10</b>	<b>Communication</b>
<b>PO11</b>	<b>Project management and finance</b>	<b>PO12</b>	<b>Life-long learning</b>

## PROGRAM SPECIFIC OUTCOMES (PSOs)

**PSO1 Manufacturing:** Modelling, Simulation and Analysis in the field of Manufacturing.

**PSO2 Design:** Develop and implement new ideas on product design with help of modern CAD tools.

## PROGRAMMES ORGANIZED

### INAGURATION OF MECHANICAL ENGINEERING ASSOCIATION

The Department of Civil and Mechanical Engineering has inaugurated the students association “ACES” and “Tornados” on 13.07.2018 at 10.00 a.m. in the Seminar Hall. Dr.N.Sundharamoorthy, Head of the Department, Mechanical Engineering welcomed the gathering. Dr.T.R.Chinnusamy, Associate professor, Head of the department, Mechanical Engineering, has introduced the office barriers for the academic year 2018-19 of Mechanical department followed by the introduction of Office barriers of Civil department by Mr.K.Mohan, Assistant Professor, Civil. The presidential address was given by our beloved Principal Dr.R.Radhakrishnan, Prof.P.Ramalingam, Head of the Department, Civil, felicitated the gathering. Mr.Mohanraj, IV Mech, Introduced the Chief Guest Er.K.SENTHIL PRABU, Senior Inspection Engineer, ABS Industrial Verification India Pvt. Ltd., Coimbatore. The chief guest started his session with the importance of Nondestructive testing and continued with the companies available for Mechanical Engineers in India where they can get a great exposure about the NDT. Also he explained the uses of NDT in Civil Engineering. The vote of thanks was delivered by Mr.S.Navin Prasath, IV year, Civil Department.



### ONE DAY SEMINAR ON “NON-DESTRUCTIVE TESTING”

The Department of Civil and Mechanical Engineering conducted One Day Seminar on “Non-Destructive testing” on 13.07.2018 at 11:00 a.m. in Seminar hall. The resource person of the seminar was Er.K.SENTHIL PRABU, Senior Inspection Engineer, ABS Industrial Verification India Pvt. Ltd., Coimbatore. Dr.N.Sundharamoorthy, Head of the Department, Mechanical Engineering welcomed the gathering and handed over the session to the resource person.

Finally he gave a demo on UPV testing method and concluded with a Quiz session. The seminar was ended with the vote of thanks delivered by Prof.P.Ramalingam, Head of the Department, Civil.



## Effective implementation of “5 S”

The members of Confederation of Indian Industry (CII) has visited on 13.09.2018 at 10.00 a.m to audit the various zones of our institute for verifying the effective implementation of “5 S”. Mr. Napoleon , HR, DMW CNC Solutions, Perundurai, Mr.Sethupathy ,CEO, Vice Management Consultancy Services, Erode, Mr. Jayaraj, HR Manager , Venbro Chemicals Pvt. Ltd. were the chief guest of the function. Top officials from various industries were also present in the function. Dr.N.Sengottiyar Director/ SSCET, delivered the welcome address. Dr.R.Radhakrishnan, Principal/ SSCET delivered the felicitation address. Prof. P.Ananda Kumar / Co-ordinator Higher Education Cell presented the importance of SWACHH Campus. The chief guest Mr. Napoleon emphasized the Importance of 5’S. Mr. Sethupathy focused his lecture on what is 5’S and where it can be implemented. The chief guests honored by the dignitaries. The valedictory function held at 2.00pm. The industrialists visited various zones of our college for 3’S auditing.



## National Level Technical Symposium INOVACE 2K18

The Department of Civil and Mechanical Engineering has conducted a National level Symposium – INOVACE’18 on 26.09.2018 at 9.30 a.m. The students from various colleges (30 – civil, 95 – Mechanical) have participated in different events. The welcome address was given by Mr.Navin Prasad (Final Civil). The felicitation address was given by Dr.R.Radhakrishnan, Principal. The special address was given by Dr.G.Kavitha, Vice principal, Prof.P.Ramalingam (HoD/Civil) and Dr.N.Sundramoorthy (HoD/Mech). The Chief Guest Er.K.Selvaraj, Managing Director, Hi-Tech CNC Academy, Coimbatore shared his experience in the field of Engineering. He explained about how the company will expect from students for their placement purpose and their future plans, in the later session he interacted with the students and gave clarifications for their queries. The valedictory function began at 4.30 P.M, in that function, both the Head of the Departments of Civil and Mechanical Engineering distributed the certificates to the participants. At last the vote of thanks was given by Ms.S.Manju (Final Civil)



## Guest Lecture on “Advanced I C Engines”

One day Guest lecture for the subject, titled “Advanced Internal Combustion Engine” was organized by the Department of Mechanical Engineering on 20.12.2018 for II and IV year Mechanical students. The resource person of the seminar was Mr.Sasikumar, General manager, Ashok Leyland, Chennai. The welcome address was given by Principal Dr.R.Radhakrishnan, then and handed over the session to the resource person.



## Seminar on “Industry Connect and Interview Techniques”

One day seminar for the subject, titled “Industry connect and interview techniques” was organized by the Department of Mechanical Engineering on 22.12.2018 for III and IV year Mechanical students. The resource person of the seminar was Shri Lakshminarayanan, HR, Zetac Casting, Chennai. The welcome address was given by Principal Dr.R.Radhakrishnan, then and handed over the session to the resource person.



# ARTICLES

## Technological Applications Impacting Manufacturing Innovation

*Let's go invent tomorrow instead of worrying about what happened yesterday.” – Steven Jobs*

A Manufacturer can be innovative in various ways beyond the use of technology. Innovation can include the utilization of new business models, the development of new processes and services, and the enhancement of existing products too.

Technology does support and drive innovation. Technological advancements can allow manufacturers to create higher quality goods faster than before, with less expense and help them realize more efficient operations to become more competitive. Innovators and engineers are constantly improving upon existing technologies to fulfill unmet needs, provide goods for untapped markets, and most importantly, looking forward to stay ahead of the competition

### 1. Additive Manufacturing / 3D Printing

Additive manufacturing was actually developed in the 1980's, but has picked up more significant interest in the last few years. Additive manufacturing technology has been expensive and was typically used by the “bigger fish” in the field. It covers any and all processes involved in printing a 3-dimensional product,

the reason it's commonly referred to as 3D printing. Additive manufacturing includes a technique called cold spraying, which involves blasting metallic particles through a nozzle at high speeds, binding particles together to form shapes.

This creates a part by building materials layer by layer through the control of a computer. Because the end result is a high precision replica of an original design, there is less waste during the production process and can save the manufacturer money. 3-D printers will continue to change the manufacturing landscape by creating more efficient ways to manufacture custom parts and goods.

## **2. Advanced Materials**

A report from the President's Council of Advisors on Science and Technology (PCAST) notes that "almost all the megatrends for the future — energy efficiency or alternate energy devices, new materials to counter resource shortages, next-generation consumer devices, and new paradigms in chemical safety and security — depend heavily on advanced materials" and that these advanced materials "will fuel emerging multi-billion dollar industries."

## **3. Cloud Computing**

Cloud based computing uses network connected remote services to manage and process data. Life in the cloud will gain momentum, but security concerns must be continually addressed. Companies are increasing use of this technology across various geographic locations to share data to make better business decisions. Cloud Computing helps reduces costs, improve quality control and shorten production times.

## **4. Internet of Things (IoT)**

Many of us now can't imagine life before the smartphone...welcome to the idea of a smart manufacturing facility. Smart technology is not brand new, but it is steadily developing into the wave of the future for manufacturing. Imagine a workplace where connected equipment will be able to communicate via the Internet and computerized manufacturing machinery will be able to "talk to each other" and send/receive notifications about operating conditions. Once a problem is detected, a notification is sent to other networked devices so the entire process can be automatically adjusted. The end result will be reduced downtime, improved quality, less waste and lower costs. This technology will lead to the development of new types of positions for the manufacturing workforce.

## **5. Nanotechnology**

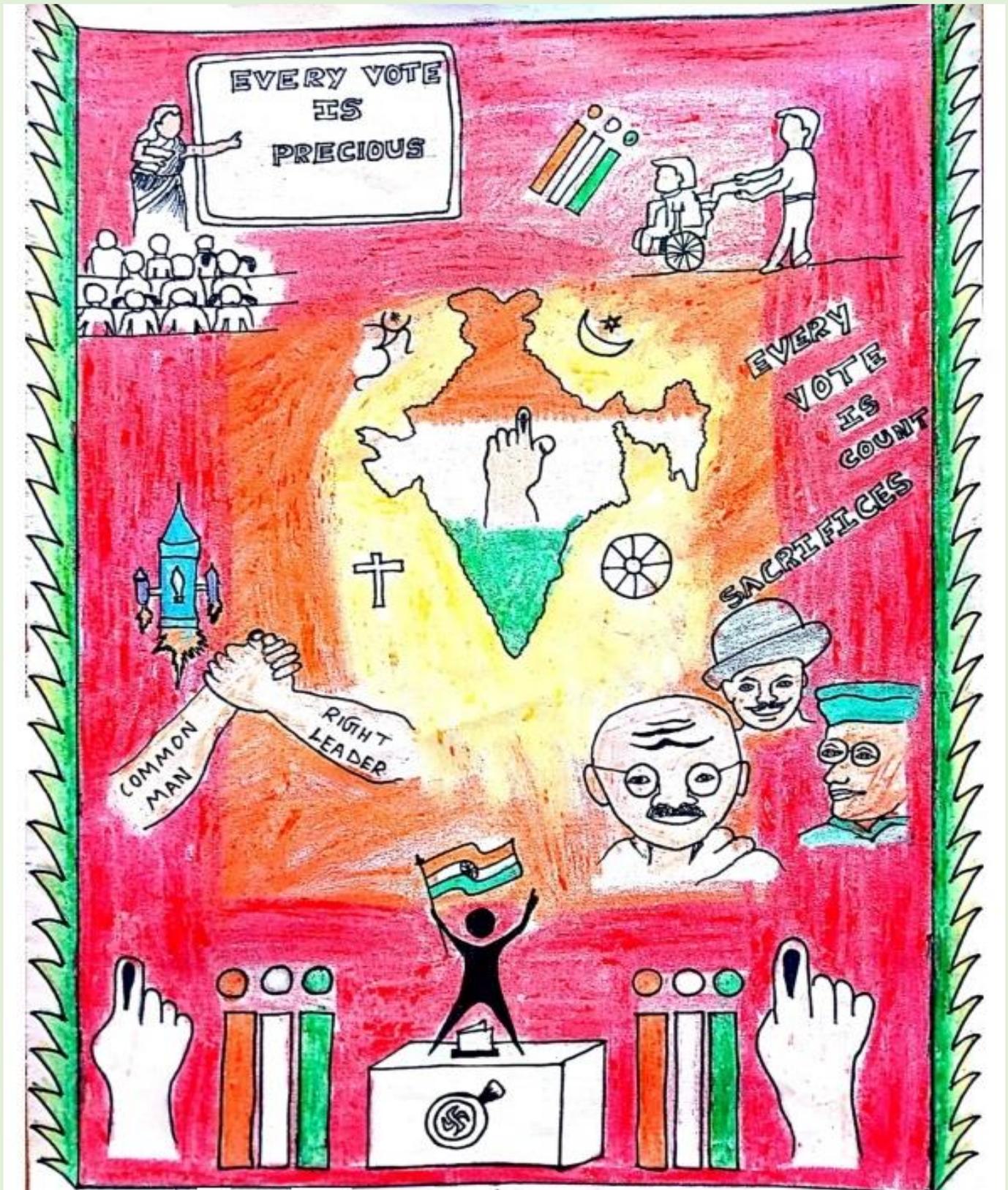
Nanotechnology deals with matter between 1 and 100 nanometers; a nanometer is one-billionth of a meter. Nanotechnology was traditionally used in the aerospace and biomedical arenas, but is now being used to manufacture lightweight stronger materials for boats, sporting equipment and auto parts, as well as being used in creating personal care items such as eyeglasses.

Nanostructured catalysts make chemical manufacturing processes more efficient by saving energy, reducing waste and will also have increased applications in healthcare and pharmaceuticals.



**RAJA M  
II MECH**

### VOTERS DAY



**DEEPANA S  
IV MECH**

## SOLAR PANEL TECHNOLOGIES

### Floating Solar Farms (aka 'floatovoltaics'):

Silicon panels are becoming cheaper and more efficient day-by-day. According to experts, if photovoltaic panels are placed on reservoirs and other water bodies, they offer even greater efficiency as well as a plethora of other benefits. **“Floatovoltaics”** are photovoltaic solar power systems created for floating on reservoirs, dams, and other water bodies.

Floating solar farms can generate huge amounts of electricity without using valuable land or real estate. The installation costs of floating photovoltaic panels are less than land-based photovoltaic panels. Also, research showed that the power production of floating solar panels is greater by up to 10% due to the cooling effect of water.

Besides producing clean solar power, floating solar farms can help with water management. They reduce the loss of water to evaporation as they limit air circulation and block sunlight from the surface of the water. Also, floating solar farms prevent noxious algae production, lowering water treatment costs. Furthermore, the water beneath keeps solar panels clean and minimizes energy waste. In 2008, the first commercial 175 kWh floating panel system was installed in California at the Far Niente winery in Napa Valley.



### BIPV Solar Technology:

Building-integrated photovoltaic, as the name suggests, seamlessly blend into building architecture in the form of roofs, canopies, curtain walls, facades, and skylight systems. Unlike traditional solar PV panels, BIPV can be aesthetically appealing rather than a compromise to a building's design. Aesthetics alone is not enough for solar buyers; economics matters too. The good news is that the BIPV solar panel systems enable homeowners to save on building materials and electric power costs. By substituting BIPV for standard building materials, you can cut down on the additional cost of solar panel mounting systems.

BIPV technology, when used on the building's facades, atrium, terrace floor, and canopies, provides the following benefits:

- Increased energy efficiency
- High thermal and sound insulation
- Clean and free power output from the sun
- Decreased O&M costs
- Zero carbon footprint



## Solar Skins:

Solar skins are a novel PV technology to integrate custom designs into solar panel systems. The solar skin technology is similar to the ad wraps displayed on bus windows. Sistine, the manufacturer of solar skins, is testing the technology at the United States National Renewable Energy Laboratory to increase its efficiency. Solar thin-film skins maintain high efficiency due to its selective light filtration advancements. The sunlight falling on solar skins is filtered to reach the solar cells beneath it. As a result, it simultaneously displays the custom image and provides solar energy.

These imprinted custom images, embedded into solar panels, can exactly match your grassy lawns or rooftops of your homes. Solar skin panels can also be beneficial for businesses or government offices. If panel aesthetics stops you from going solar, Sistine's Solar Skins might be the solution you are looking for.

## Solar Fabric:

Solar radiation is available all over the planet, so why not generate your own energy, wherever required? Imagine that besides producing solar power at a fixed location, you could also do it while on the move through your own clothing. These solar filaments can be embedded into your t-shirts, winter coats, or any other clothing to **help you keep warmer, power your phone**, and provide energy for other needs while you're on the go.

There are several areas where researchers have attempted to combine solar fabric and solar panels, which include:

- Building facades that provide both shade and power
- Awnings that lighten up streetlights, and
- Curtains that eliminate power consumption from the grid
- Solar fabricated household clothing can help you **save on solar panel mounting and installation costs**.

Solar cell manufacturing companies are also working specifically on the US Army project with a vision to create solar-powered robotic tents. With solar costs continuously falling, it's no more unlikely to imagine a future where almost everything will be powered by free solar, the sun.

## Photovoltaic solar noise barriers (PVNB)

Highway traffic noise in the US has always been a concern for everyone. To overcome this issue, 48 states have built nearly 3,000 miles of traffic noise barriers. Noise barriers were always constructed with the single aim of designing cost-effective barriers that efficiently perform noise abatement functions. However, the goal of the US Department of Energy has now evolved to merge noise abatement with sustainable power generation.



M.N.BHARATHWAJ

III MECH