AMET

ACADEMY OF MARITIME EDUCATION AND TRAINING

DEEMED TO BE UNIVERSITY

(Under Section 3 of UGC Act 1956)

Celebrating 25 Years

ELECTRIKA

2018

ANNUAL MAGAZINE 2017-2018

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERIG

ABOUT THE UNIVERSITY

AMET is India's first Deemed to be University in Maritime Education which is ranked as 3rd among Maritime Universities of the World in the PIMET (Performance Indicators in Maritime Education and Training) Ranking of International Association of Maritime Universities (IAMU). Established during 1993, AMET's uncompromising strides of excellence in the field of maritime education and training laced with its capacity to feed the global shipping industry with an unrivalled maritime human resource secured it to have many national and international recognitions, accreditations and rankings such as NAAC, NIRF, ARIIA, DGS-CIP, PIMET etc.

AMET serves as an ocean of knowledge for over 4000 students pursuing Programmes ranging from diploma to Doctoral programs through 9 schools and 23 intensive research and training centers for marine and marine related activities. Equipped with an excellent infrastructure for research and development, co-curricular and extracurricular activities AMET secured its compliance certificate for ISO 9001:2015 QMS standards from the prestigious and globally renowned DET NORSKE VERITAS, Norway.

For over two decades AMET is remaining as the favourite destination for campus interviews by many shipping giants such as AP MOLLER MAERSK, GOODWOOD, NYK, SONANGOL, VSHIPS, WALLEMS, SHELL, CHEVRON, STENA and so goes a list of over 100 companies. Besides positions onboard, AMET Business school graduates have secured lucrative jobs in commercial shipping sectors such as chartering and ship broking. Never the less, Naval architecture, petroleum engineering, harbor engineering, marine electrical and electronics engineering graduates have successfully walked away from AMET with jobs offering sumptuous packages along with an opportunity to grow and glow in their career swiftly. Needless to say about the entrepreneurship development activities nurtured into AMET'ians has been found rewarding by students who are chief executive officers of their own organization.

VISION AND MISION OF THE UNIVERSITY

VISION

To sustain identity as a World Class Leader in Maritime Education and empower learners with wholesome knowledge through progressive innovation in training, research and development which will render students a unique learning experience and a transformation impact on the Global Society.

MISION

AMET will strive continuously to

- Impart value-based higher education and technical knowledge with uncompromising strides of an outstanding quality.
- Emerge as a Centre of Excellence inculcating skill development in recent technologies in accordance with industrial trends.
- Create World class research capabilities on par with the finest in the world and broaden student's horizons beyond classroom education.
- Nurture talent and entrepreneurship to enable all round personality development among students.
- Empower students across socio economic strata
- Make a positive difference to society through technical education.

QUALITY POLICY

AMET is committed to provide the highest quality in education and be the most preferred institution for pursuing marine and marine related courses.

This will be achieved by consistent focus on:

- Providing a conducive, vibrant, progressive and enriching learning atmosphere.
- Teaching Excellence and Research Output.
- Global outlook and engaging with the world through learning, teaching and research.
- Providing competitive advantage in gaining employment for further academic opportunities.
- Maintaining excellent links with commerce and industry both national and international.
- Complying with all applicable requirements and continually improving the effectiveness of Quality Management System.

ABOUT THE DEPARTMENT

The Department of Electrical and Electronics Engineering is constituted and administered to provide a professional atmosphere for scholars, students, educators and engineers to enrich the discipline of Electrical, Electronics and Marine Engineering. The Department offers a well-balanced undergraduate Electrical and Electronics Engineering -Marine program and postgraduate M-E (Power Systems) program and PhD- Electrical and Electronics Engineering program of technological and scientific study designed to serve the professional needs of the baccalaureate.

The Department gives opportunity to learn marine related courses for the students and pursue studies related to the scientific concepts, technological advancements and design principles of Electrical and Electronics Engineering pertaining to Onshore and Offshore applications as well. This programme is designed to enable the Engineers coming out of the stream to work on board the ship as Electrical Engineers. Jobs with shipyards, dry docks, ship machinery manufacturers are some of the other fields they can look into.

ESTABLISHMENT:

Department of Electrical and Electronics Engineering is established in the year 2008 with the objective of imparting quality education of international standards and to produce highly innovative Marine Electrical and Electronics Engineers capable of solving global maritime challenges. Since its inception in the year 2008, the Department has grown steadily and acquired the present shape with excellent infrastructure, modern equipment for the laboratories and qualified and dedicated faculty to impart sound technical knowledge to the enthusiastic student community. As on date, the Department has successfully produced four batches of talented graduates who are serving in prestigious shipping industries and organizations.

The Department offers 4 years U.G program in EEE-Marine, PG program in M-E (Power Systems) and PhD in interdisciplinary Engineering domains. The Department is headed by Dr.T. Sasilatha, Professor and Dean and supported by a team of well qualified, experienced and dedicated faculties. The Specialization of staff members span around major areas in Electrical and Electronics Engineering including Marine Automation, Power Systems, Electronic

Navigation Systems, Offshore Energy Systems, Electrical machines, Energy studies, Control Systems, Power Electronics, Applied Electronics, Embedded Systems, Electrical Drives and VLSI Design.

PROGRAMS OFFERED:

- B.E - Electrical and Electronics Engineering-Marine – 4 Years
- Ph.D – Electrical and Electronics Engineering, Interdisciplinary Domains (Full time and Part time)

VISION AND MISSION OF THE DEPARTMENT

VISION

To emerge as a Centre for higher learning and research through development of highly competent, innovative and world class Marine Electrical and Electronics Engineers while remaining sensitive to ethical, societal and environmental issues.

MISSION

- To impart quality education in order to produce highly innovative, socio- economically conscious Marine Electrical and Electronics Engineers.
- To provide knowledge and skills, that is essential to meet the local and global demands in Marine Electrical and Electronics Engineering.
- To upgrade student's technical knowledge through industry interaction activities.
- To foster strong ethics, positive attitude and transform the Department into Centre of Excellence by promoting world class research and development to meet the challenging needs of society.
- To motivate and guide students for developing entrepreneurship or pursue higher education and train them for overall personality development.

B.E. ELECTRICAL AND ELECTRONICS ENGINEERING - MARINE

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

Bachelor of Electrical and Electronics Engineering – Marine program is designed to prepare the graduates will,

PEO1:

Have a successful career in Marine or other related Electrical and Electronics Engineering fields or pursue higher education and research in multidisciplinary area.

PEO2:

Apply Engineering fundamentals, technical knowledge, skills and modern tools to solve real world Electrical Engineering problems in Maritime industries.

PEO3:

Adapt to any environment and practice the ethics of their profession, consistent with a sense of social responsibility.

PEO4:

Exhibit the skills by updating the breadth of knowledge in the life-long learning process to meet the global challenges.

PROGRAM OUTCOMES (POs):

A graduate of the Electrical and Electronics Engineering - Marine Program will,

PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs):

PSO1:

Apply the knowledge of Electrical Engineering, investigate and solve the complex Marine Electrical Engineering problems to meet the specified needs with appropriate considerations for the society.

PSO2:

Develop solutions for complex Engineering problems in the broad field of power electronics and drives, power systems, high voltage Engineering and Marine Engineering and control.

PSO3:

Analyze, design and integrate Electrical systems in on board ships and apply modern tools and techniques in marine industries and create passion for life-long learning and research in advanced fields.

Educationists should build the capacities of the spirit of inquiry, creativity, entrepreneurial and moral leadership among students and become their role model

A.P.J ABDUL KALAM

DEAN'S MESSAGE

Dr. T. SASILATHA M.E, Ph.D.

It gives me immense pleasure to release the current issue of the technical magazine "Electrica" for the Academic Year 2017-2018. This is a productive technical material and subsidiary skill developing tool for the students.

Engineering is a great outlet for the imagination-the perfect zone for independent thinkers. True Engineering education is not just providing ample facilities to the students, it is a platform where hidden talents /imaginations are converted into the real and creative world. It helps to build teamwork and work with all kinds of people inside and outside the field, whether they are designers or architects, doctors or entrepreneurs.

Having said that, I am sure that this current issue will lighten up your spirits not only on the technical frontiers but also provide an insight of co-curricular and extracurricular activities conducted both at the international and national level as conference and faculty development programmes. Adding to the galore are the value- added seminars and workshops conducted for students at a part of the institute - industry interactions. The edition also enlists students' achievements and their participation in the intercollegiate conference, seminars, workshops, and also in various sports meet and much more. The magazine will aptly revive fond memories of all the achievement to reminisce and to remind upon the future targets.

I am sure the magazine will be informative and resourceful. I applaud the coordinators and efforts behind the team in bringing out this issue. I wish them all success!

GLIMPSES OF THE YEAR

The International Conference on Innovations and Research in Marine Electrical and Electronics Engineering (ICIRMEEE)-2017 was held on 6.10.2017. It was an open platform for Scientists, Researchers and engineers to exchange the latest innovations and research advancements in the areas of next- generation Automated ship, Marine electrical and control systems, Marine Electronics and Navigation Systems and other applications in the Maritime industry. Plenary sessions and invited talks from Researchers were part of the event.

Topics on Smart Grid Technologies and its Applications, Renewable Power Generation System, Power System Restructuring and Deregulation, Marine Electronic Navigation System, Offshore Renewable Energy Engineering, Ship Power Management Systems Engineering, Wireless Sensor Networks, Big Data Analytics, Signal Processing techniques, VLSI Design and Testing, Process Control and Industrial Automation, Artificial Neural Networks and Fuzzy Logic and Marine Control and Automation are worth mentioning. The event was inaugurated by Mr. DONG MIN CHAE, General Manager, JEONG-IN Pvt. Ltd.

Around 62 papers were selected for presentation in the conference. Innovative sectors like LFSR based random number generation for cryptographic application, Morphological filtering technique for ECG signal analysis werediscussed upon.

Fondling memories

ELYTRICO-2K18 National Level Technical Symposium dedicated to Morphing of Electrical, Electronics, and Control systems, Power Electronics and Drives and Computers to Marine applications. Experts from various industries relevant to Electrical & Electronics Engineering domain shared their industrial and technical knowledge.

This symposium provided a platform for knowledge sharing and exchange on breakthrough ideas. The various events conducted in the symposium provided exposure to erudite work by the Engineering students. The symposium envisaged Keynotes talks from distinguished experts from industries and Adjunct Professors. Various events were arranged the winners of various events are awarded with attractive prizes

Some abstracts are listed for reference:

- **All in One Intelligent Safety System for Women Security**

  Him Varsha Tharanga, SRM University, Chennai.

According to the reports of WHO, NCRB-social-government organization 35% women all over the world are facing a lot of unethical physical harassment in public places such as railway-bus stands, footpaths etc. This paper proposed a new model for

the women security in public places which aims to provide the 100% safe environment.

- **Development of Optical Single Fingerprint Sensor**

Sri Ram Surat Kumar, Naveen Raj and Vaidyanathan, AMET Deemed to be University

Fingerprint scanners use different types of sensors to create digital images of the minutiae. Some use sensors include optical, capacitance and ultrasonic. The technology used by them to capture the digital image varies and each one has its share of merits & demerits. Optical sensors' technology is the most developed and thus is used widely in fingerprint readers worldwide. Most of the fingerprint scanners distributed by us for biometric identification use optical sensor technology to achieve the best results.

- **Maximum Demand Controller for High Tension Industries**

P. Sridevi Ponmalar*, R. Dharani, S. Janani, Department of Electrical and Electronics Engineering, New Prince Shri Bhavani College of Engineering and Technology, Chennai, Tamilnadu, India.

At present industries use an individual controller for controlling their parameters. The main aim of the paper uses a single controller for controlling more than one parameter in a fully automatic mode.

The paper was designed as a low-cost PIC microcontroller which will sense the load utilization and will send the control signal to the load tripper relay insuch a way that the consumption does not exceed. Also, it prevents the consumer from paying the penalty to the Electricity Board. This project helps to maintain database and also, gives a voice command and also 2 phase voltage,current, and power can be monitored and controlled**.**

INDUSTRY INTERACTION

The students of the department completed the project titled Cover CTR CPAD POKA YOKA System with Barcode Automation for Hyundai SANTRO Xiang Variant. Completed with Sintex BAPL India Ltd. in association with CDCE Automation Pvt Ltd.

MoU signed between Department of EEE, AMET and CDCE Automation Pvt Ltd.

MoU signed between AMET and ICT Academy

MoU Signed between the Department of EEE and YOKOGAWA INDIA LIMITED (MNC)

MoU signed between the Department of EEE and Electronic Platform research Labs

Student's contribution

- *JAYASURYA/I-EEEM*
- *JAYASURIYA /II-EEEM*

MEMS Technology- Magic Means Micro

Micro-Electro-Mechanical Systems, or MEMS, is a technology that in its most general form can be defined as miniaturized mechanical and electro-mechanical elements that are made using the techniques of microfabrication. The critical physical dimensions of MEMS devices can vary from well below one micron on the lower end of the dimensional spectrum, all the way to several millimeters.

The term used to define MEMS varies in different parts of the world. In the United States, they are predominantly called MEMS, while in some other parts of the world theyare called "Microsystems Technology" or "Micro Machined Devices". While the functionalelements of MEMS are miniaturized structures, sensors, actuators, and microelectronics, the most notable elements are the microsensors and micro actuators. Microsensors and micro actuators are appropriately categorized as "transducers", which are defined as devices that convert energy from one form to another. In the case of microsensors, the device typically converts a measured mechanical signal into an electrical signal.

The more complex levels of integration are the future trend of MEMS technology. The present state-of-the-art is more modest and usually involves a single discrete microsensor, a single discrete micro actuator, a single micro sensor integrated with electronics, a multiplicity of essentially identical micro sensors

integrated with electros and a single micro actuator integrated with electronics. MEMS technology is sometimes cited asseparate and distinct technology.

In reality, the distinction is not so clear-cut. The well-known Scanning Tunneling-Tip Microscope (STM) which is used to detect individual atoms and molecules on the nanometer scale is a MEMS device. Similarly, the Atomic Force Microscope (AFM) which is used to manipulate the placement and position of individual atoms and molecules on the surface of a substrate is a MEMS device as well. A variety of MEMS technologies is required to interface with the nano-scale domain.

Thus, the MEMS is a technology of encompassing highly miniaturized things that cannot be seen with the human eye. The common benefits afforded by this technology, include increased information capabilities, miniaturization of systems, new materials resulting from new science at miniature dimensional scales, and increased functionalityand autonomy for systems.

Jaya Kumar. K/II YR EEEM

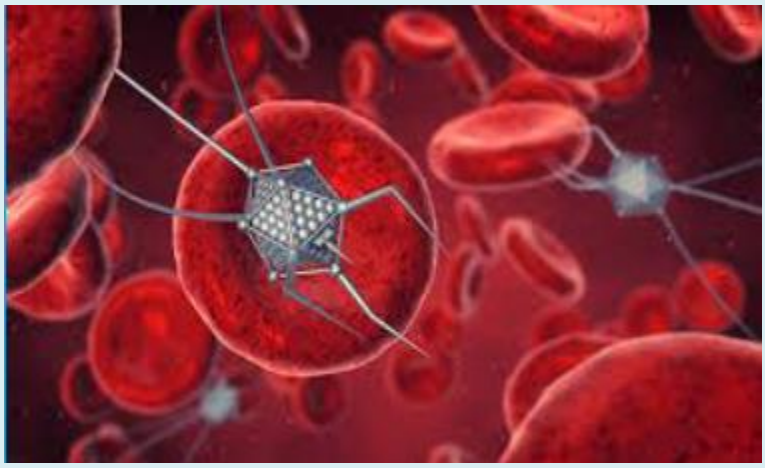
Say Goodbye to Pills. Nano Robots Can Cure

Nano robots will be able to repair damaged or diseased tissues. The circulatory system is the natural path for these devices and the nano robots will pass through the blood stream to the area of defect. They attach themselves to specific cells, such as cancer cells and report the position and structure of these tissues. A creative methodology in the use of these devices to fight cancer involves using silicon nano machines with a thin coating of gold and light in the near infrared spectrum.

Light in the 700-1000 nanometer range will pass through the tissue and reaches the defective cell. When this infrared light strikes the particular type of nano robot, the device gets hot due to the oscillation of the metal's electrons in response to the light.

Using an MRI, the nano robot is specifically placed in the cancerous region, and then the light causes the devices to heat to 131 degrees Fahrenheit which destroys the cancerous cells but doesn't damage surrounding tissues. This is the new technology, without any drawbacks. These nano robots can cure any disease without affecting any other cells or tissues.

The robot detects the cause of your fever, travels to the appropriate system and provides a dose of medicine directly to the infected area. This is going to happen in a few years of time from now. Each person is going to have a nano robot in his body which is going to monitor human body system. So, the time arrives to enjoy with the robot within our self.



Vaidyanathan M S/IIYR EEEM

Organic Solar Cell New Lighton Sustainability

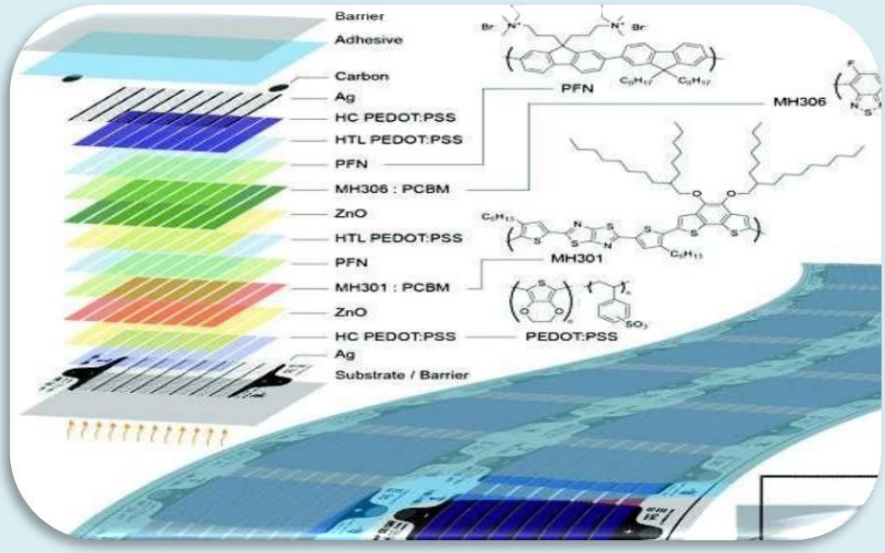
In an impressive feat of engineering, scientists in Denmark have devised a rapid, scalable and industrially viable way to manufacture large sheets of flexible organic tandem solar cells. Their successful application of roll-to-roll processing is a significant achievement for this emerging renewable technology. An Organic PhotoVoltaic (OPV) solar cell is a polymer-based thin film solar cell. OPV solar cells have been the focus of much research as they are lightweight, flexible, inexpensive, highly tunable and potentially disposable. They are also unparalleled in the number of times that they can pay back the energy used in their manufacture.

In the quest to improve the efficiency of OPVs, which, in addition to operational lifetime, is currently their key limitation, various new materials, processing methodsand device architectures have been thoroughly investigated.

Among these is the tandem cell, where multiple junctions are stacked upon one another. This can in- crease the efficiency of the cell by not only increasing the number of junctions, but, along with careful selection of complementary materials,

can make it possible to harvest photons from a broader region of the spectrum. However, this more complicated architecture renders their manufacture significantly more challenging.

Frederik Krebs and his research team at the Technical University of Denmark arespecialists in renew- able energy technologies, particularly OPVs. For the first time they have demonstrated the successful roll-to-roll manufacture of tandem OPV modules, each comprised of a stack of 14 discrete layers, which are rapidly printed, coated or deposited one on top of another by a machine reminiscent of a printing press.



The experiment was carried out in simple conditions and is extremely fast, with a single solar cell module being printed onto blank foil each second. Most importantly, the process is relatively cheap and completely scalable, with a high technical yield.

HEMANTH RAJ/ I YEAR EEEM

Happiness- SCIENCE BEHIND

As far as possible without surrender, be on good terms with all persons. Speak the truth quietly and clearly and listen to others, even the dull and ignorant; they too have their story. Avoid loud and aggressive persons, they are vexations to the spirit. If you compare yourself to others you may become vain and bitter, for always there will be greater and lesser persons than yourself. Enjoy your achievements as well as your plans. Keep interested in your career however humble; it is a real possession in the changing fortune of time.

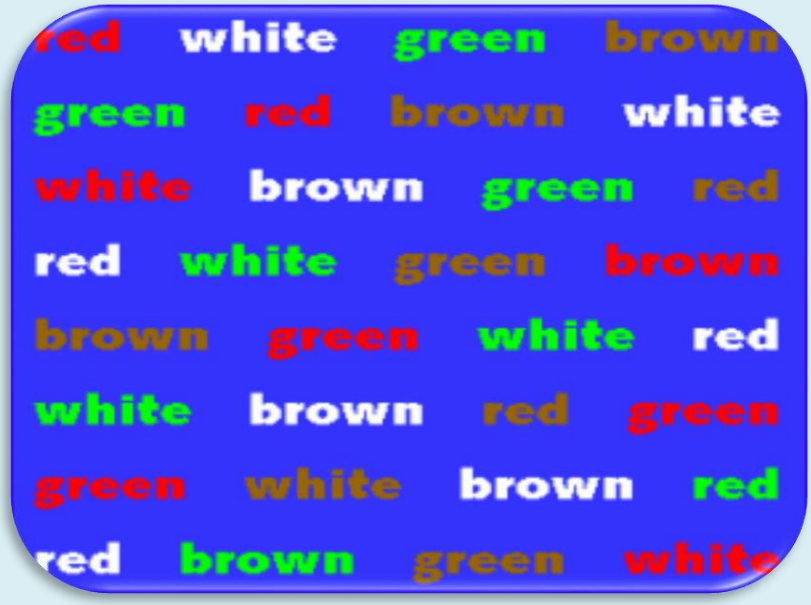
Exercise caution in your business affairs, for the world is full of trickery. But let this not blind you from what virtue there is. Many persons strive for high ideals and everywhere life is full of heroism.

Be yourself, especially do not feign affection. Neither be cynical about love; for in the face of all aridity and disenchantment, it is as perennial as the grass. Take kindly the counsel of the years, gracefully surrendering the things of youth. Nurture the strength of spirit of shield in sudden misfortune. But do not distress yourself with imagination. Manyfears are born of fatigue and loneliness.

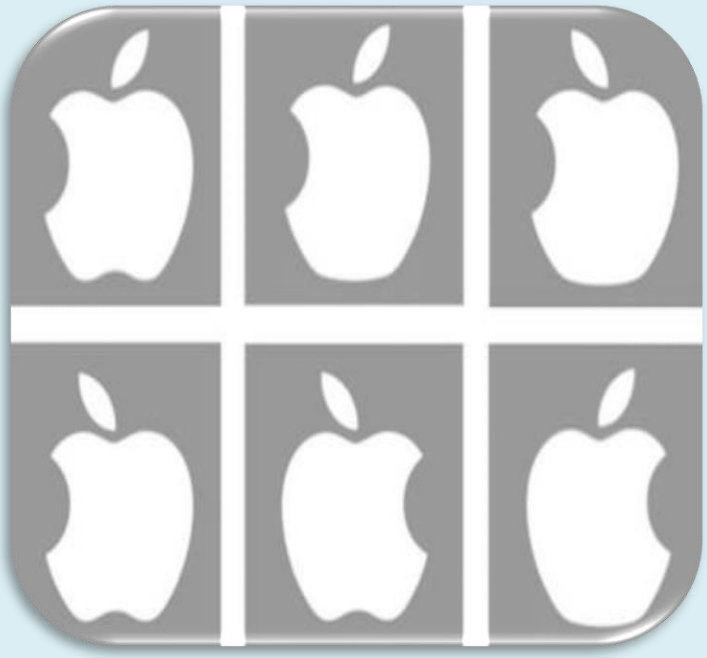
Beyond a wholesome discipline, be gentle with yourself. You're a child of the Universe,no less than the trees and the stars; you have right to be here. And whether or not it is clear to you, no doubt the Universe is unfolding as it should be.

Therefore, be at peace with GOD, whatever you conceive him to be and whatever labours and aspirations, in the noisy confusion of life, keep peace with your soul. With all it shams, drudgery and broken dreams, it is still A BEAUTIFUL WORLD.

SNAHASISH SAHA IIYR/EEEM



Can you recognize the correctApple logo?



- Ready to test your mental vitality and flexibility?

- Quick — say aloud what color you see in every word, NOT the word you read.

- Go from left to right, from top to down. Ready. Set. Go!

For Paving a Path: Marie Curie

There will be times in your life when people tell you that you can't or won't accomplish something. When they do, keep Marie Curie in mind. A pioneer in the field of radioactivity, she was not only the first woman to receive a Nobel Prize, but was also the only person to receive the award twice and in two different sciences! She was also the first female professor at the University of Paris -all at a time when the contributions of women were largely devalued.

Curie herself once said, "One never notices what has been done; one can only see what remains to be done."

We can think of no better philosophy for forging your way -- both during your degree and for life in general -- than this one.

MAD GENIUSE: Unsung Hero

Nikola Tesla was one of science's unsung heroes. He arrived in America from Serbia in 1884 and quickly went to work for Thomas Edison, making key breakthroughs in radio, robotics and electricity, some of which Edison took credit for. (Tesla really invented the light bulb, not Edison). But Tesla wasn't just compulsive in his scientific quest. He probably had obsessive compulsive disorder (OCD), refusing to touch anything even the slightest bit dirty, hair, pearl earrings or anything round. In addition, he became obsessed with the number 3, walking around a building three times before entering it. And at each meal, he would use exactly 18 napkins to polish the utensils until they sparkled.

Cups and Coffee Story

A group of alumni, highly established in their careers, got together to visit their old university lecturer. Conversation soon turned into Complaints about stress in work and life. Offering his guests coffee, the Lecturer went to the kitchen and returned with a large pot of coffee and an assortment of cups: porcelain, plastic, glass, some plain looking and some expensive and exquisite, telling them to help themselves to hot Coffee.

When all the students had a cup of coffee in hand, the lecturer said: “If You noticed, all the nice looking, expensive cups were taken up, leaving behind the plain and cheap ones. While it is but normal for you to want Only the best for yourselves, that is the source of your problems and stress. What all of you really wanted was coffee, not the cup, but you consciously went for the better cups and are eyeing each other’s cups.”

“Now, if Life is coffee, then the jobs, money and position in society are the cups. They are just tools to hold and contain Life, but the quality of Life doesn’t change. Sometimes, by concentrating only on the cup, we fail to enjoy the coffee in it.”

So please, don’t let the cups drive you…enjoy the coffee.

Lunch with GOD

There once was a little boy who wanted to meet God. He knew it was a long trip to where God lived, so he packed his suitcase with cupcakes, several cans of root beer and started on his journey. When he had gone about three blocks, he saw an elderly woman. She was sitting on a park bench watching the pigeons. The boy sat down next to her and opened his suitcase. He was about to take a drink from his root beer when he noticed the lady looked hungry so he offered her a cupcake. She gratefully accepted and smiled at him. Her smile was so wonderful that he wanted to see it again, so he offered a root beer as well. Once

again, she smiled at him. The boy was delighted! They sat there all afternoon eating and smiling without saying a word.

As it began to grow dark, the boy realized how tired he was and wanted to go home. He got up to leave but before he had gone no more than a few steps, he turned around and ran back to the old woman, giving her a big hug. She gave him her biggest smile ever. When the boy arrived home his Mother was surprised by the look of joy on his face. She asked, what has made you so happy today. He replied, I had lunch with God. Before his mother could respond he added, you know what She's got the most beautifulsmile in the whole world!

Meanwhile, the old woman, also radiant with joy, returned to her home. Her son was stunned by the look of peace on her face. He asked, Mother, what has made you so happy today She replied, I ate cupcakes in the park with God. And before her son could reply, she added, you know, he is much younger than I expected.

Too often we under estimate the power of a touch, a smile, a kind word, a listening ear, an honest compliment, or the smallest act of caring; all of which have the potentialto turn life around. People come into our lives for a reason, a season, or a lifetime.

Akbar Birbal Court Puzzle

A man was brought to Akbar's court and he found the man guilt of a little offense. He decided to punish the man and asked him to make a statement. If thestatement is held true by Akbar, the man will be killed by hanging him to death and if the statement is held false, the man will be killed by giving poison. The man was confused. He did not know what to say. Therefore, he looked at

Birbal and asked for suggestion. Birbal thought for a while and decided to help him, as he had not committed a major offense. He told something in his ear andthe man then said the statement to Akbar.

After hearing the statement, Akbar could not kill him. What was the statement?

ANS:

The man said, 'I will be killed by giving poison.'

If Akbar says the statement is true, the man will be killed by hanging which will make his statement false.

If Akbar says the statement is false, the man will be killed by giving poison which will make the statement true.

Thus Akbar had no choice but to leave the man unpunished.

PUZZLE TIME

LEVEL: EASY

			2	6		7		1
6	8			7			9	
1	9				4	5		
8	2		1				4	
		4	6		2	9		
	5				3		2	8
		9	3				7	4
	4			5			3	6
7		3		1	8			

LEVEL: INTERMEDIATE

			6			4		
7					3	6		
				9	1		8	
	5		1	8				3
			3		6		4	5
	4		2				6	
9		3						
	2					1		

AN SWER 1:

4	3	5	2	6	9	7	8	1
6	8	2	5	7	1	4	9	3
1	9	7	8	3	4	5	6	2
8	2	6	1	9	5	3	4	7
3	7	4	6	8	2	9	1	5
9	5	1	7	4	3	6	2	8
5	1	9	3	2	6	8	7	4
2	4	8	9	5	7	1	3	6
7	6	3	4	1	8	2	5	9

ANSWER 2:

1	2	3	6	7	8	9	4	5
5	8	4	2	3	9	7	6	1
9	6	7	1	4	5	3	2	8
3	7	2	4	6	1	5	8	9
6	9	1	5	8	3	2	7	4
4	5	8	7	9	2	6	1	3
8	3	6	9	2	4	1	5	7
2	1	9	8	5	7	4	3	6
7	4	5	3	1	6	8	9	2

MAGIC WITH CODE

Try to execute the output for the program in C++;

```
#include <stdio.h>
 #include<iostream>main ()
{
   int a, b, c;
   int count = 1;
   for (b=c=10; a="- FIGURE?
   UMKC, XYZHello Folks, \
   TFy.QJu ROo TNn (ROo)SLq
   SLq ULo+\
   UHs UJq
   TNn*RPn/QPbEWS_JS
   WQAIJO^\
   NBELPeHBFHT}
   TnALVlBLOFAkHFOu
   FETp\
   HCStHAUFAgcEAelc
   lcn^r^r\\tZvYxXy\
   T|S~Pn SPm SOn
   TNn ULo0ULo#ULo-
```

```
        W\Hq! WFs XDt."
        [b+++21];)
        for (; a-- > 64;)
        putchar ( ++c=='Z'
        ? c = c/ 9:33^b&1);
        std::cout << "Y O
        Y O M A G";
        return 0;
    }
```

OUTPUT:

P. Dhanasekar/I Year EEEM

Points to Consider When Selecting an NTC Thermistor

This article explores NTC thermistor types and their critical performance criteria and provides advice on selecting the appropriate device for a given application.

Why NTC?

There are three main temperature sensor technologies, each having its own characteristics: resistance temperature detector (RTD) sensors and two types of thermistors, positive and negative temperature coefficient thermistors. RTD sensors are used mainly for measuring extensive temperature ranges, and because they use pure metals, they tend to be more expensive than thermistors. Therefore, as thermistors measure temperature with the same or better accuracy, they are usually used in preference to RTDs. As the name suggests, the resistance of positive temperature coefficient (PTC) thermistors increases as the temperature rises. They are commonly used as temperature limit sensors in shut-off or safety circuits as, once the switching temperature is met, the resistance spikes. Negative temperature coefficient (N thermistors, on the other hand, diminish in resistance as the temperature rises. The resistance temperature (R-T) relationship is a flattened curve, making it highly accurate and stable for temperature measurement.

Key Selection Criteria

NTC thermistors are highly sensitive and measure temperature with high accuracy (+0.1°C), making them the ideal technology for measuring temperature in a wide range of applications. However, the choice of which type to specify depends on a few criteria - temperature range, resistance range, measuring accuracy, environment, response time, and dimensional requirements.

Epoxy resin-coated NTC elements types have a rugged construction and measure temperatures

typically between -55°C and +155°C, while glass-encapsulated NTC elements can measure up to +300°C. For applications where extremely fast response time is required, glass-encapsulated elements are a more appropriate choice. They are also more compact, with diameters down to 0.8mm.

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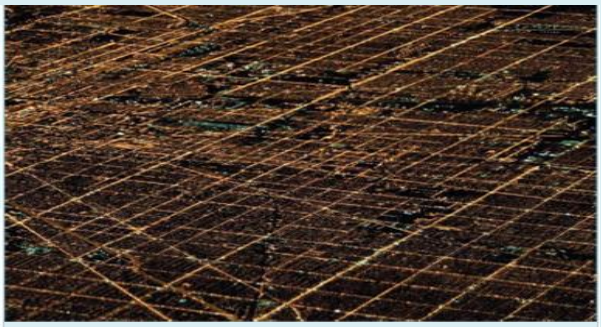
Nature Inspired Inventions

HIVE MIND GRID

Though nobody ever tells them what to do, bees in a hive instinctively sense what jobs need doing and get on to it – based simply on where in the hive they are and what other bees are doing around them. Regen Energy in the US adapted this 'swarm logic' to improve the efficiency of energy grids. Instead of using a central system to redirect power loads, the company places local controllers that communicate wirelessly with one another, and figure out on their own where power needs to go.

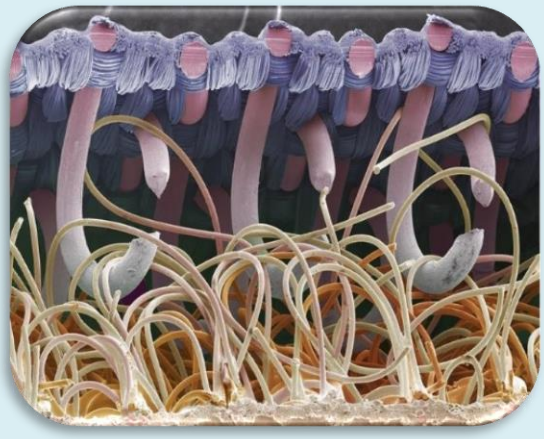
The hive mind is helping the way we use power across the grid.



Local nodes, not a central system, control power flow.

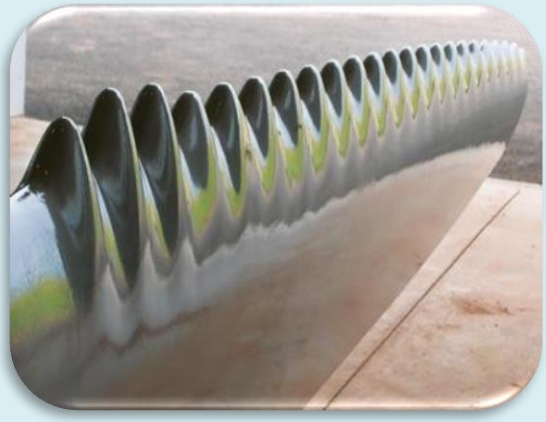
VELCRO

In 1941, Swiss electrical engineer George de Mestral went hunting in the Alps and afterwards noticed his clothes, and his dog's fur, were covered in burdock burrs. This mechanism of clinging to passing creatures is the burdock's way of spreading seeds across greater distances. Mestral put one of the burrs under a microscope and discovered the simple hooks which allowed it to cling to loops in his socks and in dog hair. The discovery inspired Mestral to create velcro, which he patented in 1955



WHALE FIN WIND-TURBINE

In a Boston gift shop, Frank Fish, a biologist, noticed the bumps running along the fins on a statue of a humpback whale, and assumed the artist had made a mistake. Instead of protruding from the back edge of the fins, the bumps surely ran along the front. But the artist was right. A row of warty ridges creates tiny vortices which help the fin cut through the water, and explains the humpback's surprising agility. After studying this 'tubercle effect', Fish discovered that adding rows of bumps to turbine blades reduced drag and noise, and increased their efficiency.



JUST FOR LAUGHS

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A sunset is nothing more and nothing less than the backside of a sunrise.

-Craig D. Lounsbrough

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