PANIMALAR ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to Anna University, Chennai)

JAISAKTHI EDUCATIONAL TRUST

BANGALORE TRUNK ROAD, VARADHARAJAPURAM,

POONAMALLEE, CHENNAI – 600 123

Department of Electrical and Electronics Engineering

IMPULSE (Technical magazine)

Academic Year 2023-2024

Col. Dr. Jeppiaar, M.A. B.L., Ph.D
Founder and Chairman

Message from secretary and correspondent

Engineers play the most vital and important role in nation building. They create new inventions using best engineered technologies to make human life more comfortable, secure and productive. In modern times, nations which have rich engineering and experienced management domains are flourishing economically and are providing better lives to their people We have excellent potential to grow in diversified areas and excel in Engineering and Management fields. We need enormous number of engineers and managers to write next story of success.

The essence of Engineering and Management education which has spread in India is a very positive sign not only to cater domestic needs but provide manpower to the entire world and become biggest technically trained community. JAISAKTHI EDUCATIONAL TRUST is a venture contributing to this Endeavour. We have started with full force to play a leading role in providing quality education and careers. We have identified the needs of modern engineering, technology and management education for modern age students, with a vision and mission accompanying transparency, accountability and accessibility which keeps us abreast and also ahead of our competitors.

At the outset I send my greetings to the Editorial Board of IMPULSE'23, for working on a Magazine best in all aspects. We want to provide a complete package of educational services to JET students. I believe this magazine will provide us the benchmark for continued improvement in overall development of the College. This magazine should be a good source of guidance for faculty and coming batches of students in choosing activities of their choice in their future for building their careers. I appreciate the efforts of the Editorial team who have done an excellent job in compiling JET activities over the year and disseminate them through this Magazine as well as on the JET website.

Dr. P. Chinnadurai, M.A., Ph.D
Secretary and Correspondent

Message from Director

"A DREAM COMES TRUE"

It is gratifying to be part of IMPULSE'23 and sketching this message for the consideration by the organizing and participating alumni of PEC as well as budding engineer entrepreneurs. I also thank the alumni for the space provided to express the views.

Alumni of every institution make major contribution to the institution more than any other constituent of the college / institution. They are the pillars for the decades / centuries of growth ahead in time. The complementary part is the assured personal growth to unsealed proportion as every alumnus is identified by the institution tag.

All self-financing Engineering colleges affiliated to various institutions are witnessing the era of three decades of EEE domination, which is presently tapering off. During this era the passed out students manning the needs of the EEE industry have contributed immensely to the "Shining India". These outstanding students migrated to this green pasture to pursue excellence leaving a side the core engineering area. Such a talent was not available to the societal turn around expected of Tamilnadu and India. The chronicle of academic excellence reveals missing pages of such graduates. As a result, the quality and standard of living in our villages have fallen behind the planned targets. The achievement was concentrated and centered on few cities only in which EEE companies are situated.

My view is that emphasis in placement and career choice should be highly inclusive and identify the components of academic excellence needed to do so. The well placed alumni of this institution should allocate time and money for this yeomen service. I sincerely believe that the forthcoming alumni meet will focus on many of the important issues like the present one.

I wish this meet all success.

Dr. C. Sakthi Kumar M.E., PhD.
Director

Message from HOD

Good things remain good only because they are always scarce. I am glad to pen for this wonderful magazine as an appreciation of the commendable efforts put forth by the team for its grand beginning. The efforts taken to bring about innovative content is appreciable. Content on the various opportunities available in the corporate world and alerts on various student level competitions shall be included hence forth.

EEE is the power Department of the Panimalar Engineering college With the growing demand of Electrical Engineers in the Government and private sectors, the Department is making best efforts to produce highly trained and capable engineers who can take up the challenges of the real world. The quality of academic instructions, conduct guidelines and college activities are designed to produce competent and successful engineers. In the Department, the focus is on preparing professional engineers.

It is my immense pleasure to send this message to the release of this Magazine of our Department. It is indeed a pleasure to see the progress of students at a time, when the country is moving ahead with development plans in Electrical Energy sector. I wish all the students who have involved in bringing out the magazine for their greater success and career ahead.

Dr.S. Selvi M.E., Ph.D
Professor and Head

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VISION OF THE DEPARTMENT

"To provide excellence in technical education of electrical and electronics engineering and produce globally competent engineers for the revolution of industry."

MISSION OF THE DEPARTMENT

- **To Provide good infrastructure and serene environment to our students and faculty members to meet the requirement of electrical and electronics engineering.**
- **To prepare the students through contextual technical education for their career enrichment.**
- **To impart knowledge on core engineering fields through projects, workshops and industry interaction.**
- **To prepare graduates with ethical, social and environmental awareness to demonstrate professionalism in multidisciplinary environment.**

Programme Educational Objectives (PEO)

PEO 1: To prepare students to analyze, design and implement basic electrical circuits and power systems using the knowledge of basic science and mathematics.

PEO 2: To train students with scientific and engineering knowledge so as to comprehend, analyze, design and create novel products and solutions for real time problems.

PEO 3: To prepare students with robust knowledge in core engineering for the betterment of placement, research and higher studies.

PEO 4: To inculcate graduates with communication skills, leadership qualities in their profession and adopt to current trends by engaging in lifelong learning.

PEO 5: To prepare graduates to demonstrate professionalism with social and ethical values.

PROGRAM OUTCOMES (POs)

PO 1: Engineering Knowledge : Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialisation to the solution of complex engineering problems.

PO 2: Problem analysis : Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3: 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.

PO 4: 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.

PO 5: 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.

PO 6: 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.

PO 7: Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of need for sustainable development.

PO 8: Ethics : Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9: Individual and Team Work : Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10:Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large. Some of them are, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11: 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.

PO 12: Lifelong learning : Recognise the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES(PSOs)

PSO 1: Apply the basic knowledge of electrical and electronics engineering to analyze and solve the complex problems in Electrical Machines, Control Systems, Instrumentation, Power Systems and Power Electronic Systems.

PSO 2: Design and develop hardware and software requirements to meet the needs of Electric drives, Automation, Power Systems and Embedded systems based industries.

PSO3: To take up roles in a team, develop managerial skills, and contributes towards the electrical community globally

MILLION-DOLLAR IDEA

Electric Eye That Enables Blind People to See

Is today's idea brilliant or a bomb?

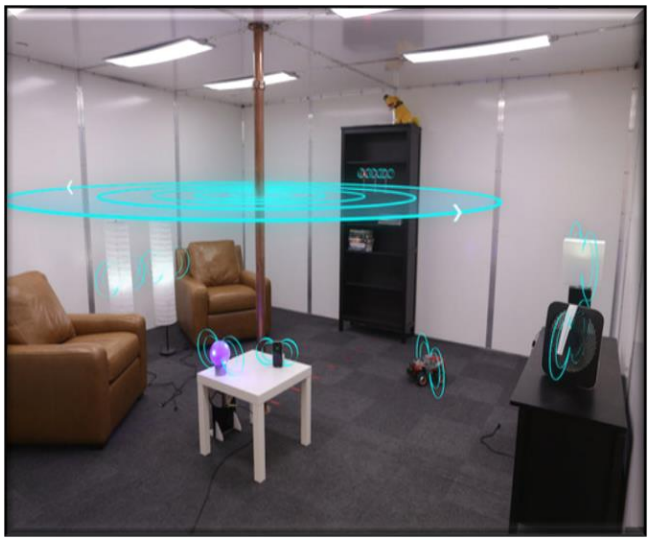
The Idea: The Electric Eye is a microchip that will give a blind person the capacity to recognize faces and even navigate a room. In effect, the blind person will gain partial eyesight. The microchip is encased in titanium to prevent water damage and is implanted onto a patient‘s eyeball. The user wears special glasses with a camera that transmits images to the microchip implant and fires an electrode under the retina, stimulating the optic nerve.

Whose idea: A team of 26 researchers from MIT's Research Laboratory of Electronics, the Boston Veterans Administration Medical Center, and Massachusetts Eye and Ear Infirmary, all experts in various fields ranging from surgery to micro fabrication.

Why it's brilliant: The Electric Eye tackles the two leading causes of blindness, retinitis pigmentosa and age-related muscular degeneration. This microchip implant is a significant development in science, proving just how much benefit advancements in science can bring to health

VIGNESH N
IV YEAR EEE

ENTIRE METAL ROOM INTO A WIRELESS CHARGER



When you need to charge your electronic devices on the go, it can be a hassle trying to find somewhere to plug in. And though some devices can already be charged without wires, researchers at The Walt Disney Company have recently supersized the technology by building a wireless "charging room."

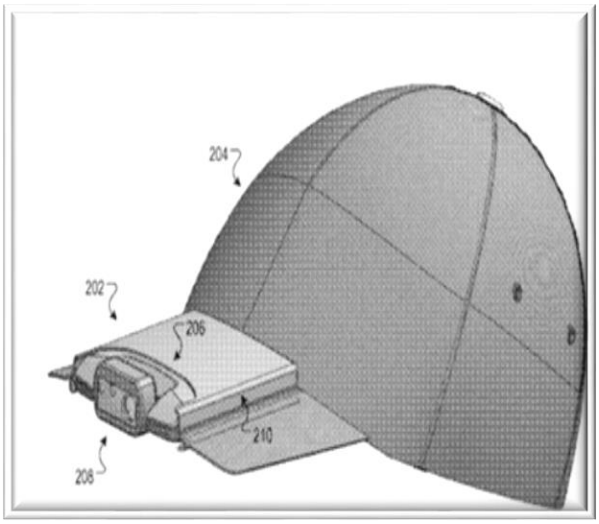
The researchers said they were inspired by inventor Nikola Tesla, who created the first system to wirelessly transmit electricity — the Tesla coil.

Tesla believed there could be a global network of wireless electricity that would use an electromagnetic wave that reverberated between the ionosphere (a layer of the Earth's atmosphere filled with ions and free electrons) and the ground. We have a metalized room, and we're going to use standing electromagnetic waves that reverberate all around this room, providing wireless power to any devices inside.

Quasistatic cavity resonance (QSCR), the wireless charging technology uses electromagnetic fields generated by electrical currents. The Research's room is outfitted with aluminum-paneled walls and a centrally located copper pole that houses 15 capacitors (which store electrical energy, as batteries do). As the capacitors generate electrical currents, they travel through the ceiling, walls and floor, and then back through the pole. These electrical currents create the electromagnetic fields that circulate around the pole and wirelessly charge devices in the room. Furniture and other objects can still decorate the room without interfering with the currents, according to the researchers, because magnetic fields don't react strongly with these commonplace objects. It's also safe for humans to occupy the space for any amount of time, because the researchers' simulations met federal safety regulations while still transmitting 1.9 kilowatts of power — enough to charge cellphones, laptops, lamps and other small electronic device

VENNILA.S
IV YEAR EEE

HAT-CAMERA COMBO BE



Google recently filed a patent for a technology-enhanced baseball cap that can take still photos and capture video from a camera mounted on the brim. The high-tech cap may be the tech giant's follow-up to its failed Google Glass and could offer competition to similar wearable devices, including Snap's Spectacles.

The hat-and-camera system that offers users an interactive experience for social media purposes, and it can also be used for personal safety. Users could share photos or video directly from what's been dubbed the Google Hat to a social media account, but the hat's technology could also be useful in an emergency. This model indicates that the wearable camera hat could protect the user from a threatening situation.

The user can activate an emergency situation indicator and cause the wearable camera system to transmit a video feed to an appropriate emergency handling system, potentially deterring a dangerous person near the user.

- PRAVEEN.S
IV YEAR EEE

SOLAR BAG

The solar bags are mobile power generators, designed to charge devices without tying to a power outlet, which makes them ideal for traveling. Just plug a standard car charger into the bag and recharge most small electronic devices including: cell phones, cameras, two way radios, PDA's, and MP3s. If we don't have a car charger, the bags come with a set of 11 standard adaptors for common cell phones and other devices. It also consists of full range of optional adaptors. Embedded in the outside of the bags are three lightweight, tough, waterproof solar panels which generate up to 4 watts of power. This means quicker charge times.

Included with each bag is a Li Ion battery pack which stores any surplus power generated, so it is available when you need it - not just when the sun is up. The battery pack can also be charged using an AC travel charger or car charger (both included). This makes the voltaic bags just as useful on the grid as off.

– VINOTH G
III YEAR EEE

THE ROLLING ARCADE

The industrial designer Jiang Qian has conceived of a subway strap that's also a video game. It has a button on each side that you push with your thumb as you hang on; instead of a joystick, you control

Movement by twisting the handle from side to side. Jiang imagines that new Types of games could be created, where keeping your balance while the train is in motion is part of the challenge.

-SUSHMITHA .S.S.S
III YEAR EEE

TRANSPARENT SMARTPHONES

The chip, known as (TRRAM) or transparent resistive random access memory, is similar to existing chips known as (CMOS) or metal-oxide semiconductor memory, which we use in new electronics. The difference is that TRRAM is completely clear and transparent. What is the benefit of having transparency? It is a new milestone of transparent

Electronic system. By integrating TRRAM with other transparent electronic components, we can create total see-through embedded electronic systems. The technology could enable the windows or mirrors in your home to be used as computer monitors and television screens. This technology is expected to be available within 3 to 4 years.

-PREETHY .G
II YEAR EEE

VERSUS LOSERS

The winner is always a part of the answer.

The loser is always a part of the problem.

The winner always has a programme.

The loser always has an excuse.

The winner says, “let me do it for you”.

The loser says “that is not my job”.

The winner sees an answer for every problem.

The loser sees a problem for every answer.

A winner makes commitments.

A loser makes promises.

Winners have dreams.

Losers have schemes.

Winners say, “I must do something”.

Loser say, “something must be done”.

Winners are a part of the team.

Losers are apart from the team.

Winners see possibilities.

Losers see problems.

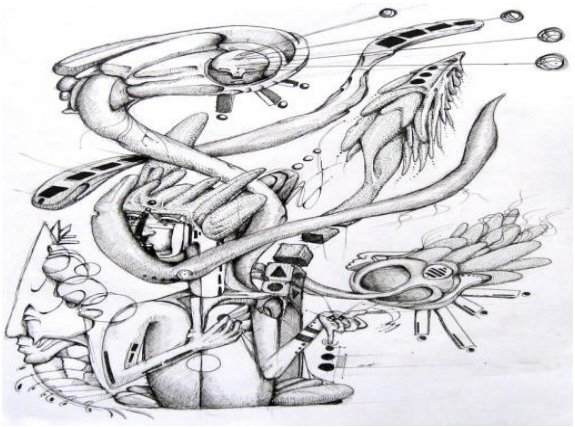
Winners see the gain.

Losers see the pain.

– **YOGAPRIYA M** **III YEAR EEE**

PENCIL SKETCH

GOKUL S, III YEAR EEE



M.MANONMANI
III YEAR EEE

- HILTON .R
III YEAR EEE

LOW BATTERY? NEW TECH LETS YOU WIRELESSLY SHARE POWER

It’s any phone-obsessed person's nightmare: you're out, your phone's battery is depleted down into the red zone, and

there's not an electrical plug in sight. But one day, mobile and wearable devices could engage in "power-sharing," by wirelessly charging

A number of devices now exist to provide extra power to mobiles and wearable’s, such as power packs, mobile hand generators and solar cells. But although external power packs have become popular, they add size and weight, and mobile hand generators and solar cells produce only limited amounts of power.

Instead, an invention called Power Shake allows mobile and wearable devices to wirelessly charge other mobile and wearable devices on the go, even when those devices are being held or worn. Wireless-charging technologies are becoming more prevalent, but many of these stations are fixed, and do not account for devices near or in contact with skin.

Wireless charging involves at least two coils-one in the power transmitter, and one in the power receiver. When an electric current passes through the power transmitter coil, it creates an electromagnetic field that can transfer charge to another coil. Power transmission is best at close distances, the scientists said.

-Mrs.MERLIN SUBA .G
ASSO.PROFESSOR / EEE

MEMS TECHNOLOGY

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 micro fabrication. 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 they are called “Microsystems Technology” or “Micro Machined Devices”. While the functional elements of MEMS are miniaturized structures, sensors, actuators, and microelectronics, the most notable elements are the micro sensors and micro actuators. Micro sensors 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 micro sensors, 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 micro sensor, a single discrete micro actuator, a single micro sensor integrated with electronics, a multiplicity of essentially identical micro sensors integrated with electronics and a single micro actuator integrated with electronics.

MEMS technology is sometimes cited as separate 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. In fact, a variety of MEMS technologies is required in order 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 functionality and autonomy for systems.

-DR.S.DEEPA
ASSOCIATE PROFESSOR /EEE

NO DEFENCE WITHOUT TALON

TALON is a powerful, lightweight, versatile robot designed for missions ranging from reconnaissance to weapons delivery. Its large, quick release cargo bay accommodates a variety of sensor payloads. Built with all weather, day/night and

Amphibious capabilities standard TALON can operate the suitcase portable robot is controlled

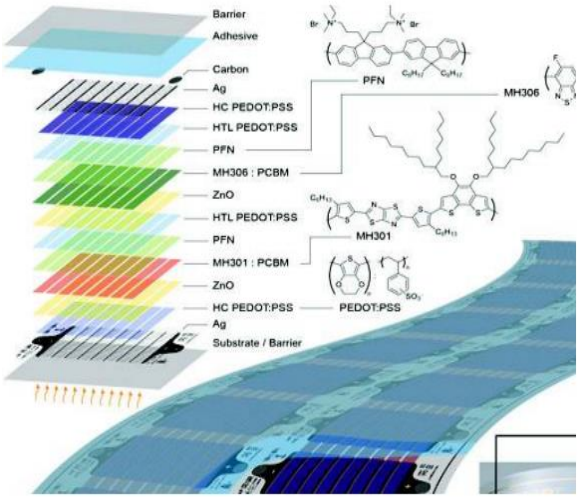
Through a two-way RF/F/O line from portable or Wearable Operator Control Unit (OCU) that provides continuous data and video feedback for precise vehicle positioning TALON payload and sensor include multiple cameras, a two stage arm, NBC sensors, radiation sensors, communication equipment. The TALON robot is used for bomb disposal. It is operated by radio frequency and equipped with four video cameras.

The TALON began helping with military operations in Bosnia in 2000. TALON robots had been used in about 20,000 missions in Iran and Iraq. Soldiers operate the swords by remote control from up to 1,000 meters away.

-Dr.A.SIVAKUMAR
ASST.PROFESSOR G1 / EEE

ORGANIC SOLAR CELL NEW LIGHT ON 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

.

Among these is the tandem cell, where multiple junctions are stacked upon one another. This can increase 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 are specialists in renewable 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.

'If I have made a kilometer of solar cells, then I am not interested if one module has an efficiency of 10% and the rest are 2% – I think what is important is what you can make for the public,' says Krebs. 'I am the guy that makes a lot of it and tries to look for the average and what is practical, and then there are the other guys that look at what is obtainable. Everybody has their role to play and hopefully we will meet some day, probably somewhere in the middle.'

'The performance from these fabricated devices has a long way to go to achieve commercial viability,' states Seth Darling, an expert in solar energy conversion at Argonne National Laboratory, US, 'but this work clearly shows that the process itself is feasible and has the potential for genuine market impact.' The future direction of this research now lies in materials development, and in the optimisation of each layer for the manufacturing process.

-Dr. P. HARIRAMAKRISHNAN
ASSO.PROFESSOR / EEE

THINGS TO DO FOR SELF IMPROVEMENT

- To improve yourself you have to be courageous!
- Self- improvement is when you change yourself to the better. Nobody is perfect. Every individual has to change from time to time accordingly in order to improve themselves from their origin.
- We can improve our skills such as, leadership skills, goals, organizational skills, communication skills and all our values within ourselves to make us a better person. It is bogus that everybody is successful. But in order to be successful we need to improve ourselves or else we will be stuck inside the same zone.
- Self – improvement deals with inner change, throwing away our negative habits and absorbing all the positive ones.
- Self- improvement is a generic label and can be applied in various phases of life. This is also otherwise referred to as personal development.

EXPRESS YOUR GRATITUDE AFTER WAKING UP FROM SLEEP

- After waking up in the morning, sit up in your bed and be thankful for all the things that you are obliged for. List about 5 things that you wish to be grateful for.
- It may be for getting such wonderful parents, sweet siblings, blessed life and so on, it depends in accordance to the priorities and desires of each individual.

- This may eventually kick things up and offers a momentum for the beginning of a good and successful day. Especially when compared to the other days where you wake up lazy, groggy and pushing yourself to start your day of work.

EXERCISE AND HEALTHY DIET

- Exercise has abundant benefits, especially when it comes to self-improvement, this can be the best way to keep your life hale and healthy.
- It improvises your strength and helps to improve your body‘s immune system. Most importantly exercise keeps you in good shape, physically and mentally.
- Exercises have 101 benefits which are associated with an esteem of immense benefits and values. If self- improvement is your ultimate target, then exercise with no doubts will b e a part of your habit.
- It is very important to be conscious on what you consume. A proper diet is a very important issue to be considered in our day-to- day life.
- It is also important that you maintain a balanced diet with sufficient nutrients and proteins to help manage your immune system and supply you with the necessary energy.
- A self- sufficient diet and an hour of exercise would be the perfect thing for self- improvement as it keeps you in good shape and health.

SPEND SOME TIME READING

- Though this habit is overshadowed by all the other habits, it is indeed a useful and intellective part of time you will be investing on it.
- Reading is a special habit which improves our knowledge and language and helps develop a good grade of communication and also helps build confidence within an individual.

- Most of us are lazy to just get a book and sit in the same place like a couch potato. This would definitely create boredom and may even lead you to lose the interest on reading. Instead, you can prefer reading any blogs or magazines. Real time articles are more interesting to read and it ought to keep you occupied for hours together once you start reading them.
- Self- improvement can be absolutely fun and rewarding. Simply look at all the people around you. Try to observe the way they behave. If you find out some negative qualities in some one, examine it with yours. If you find out that you have that quality then it will be appropriate for you to change it.
- It is something that teaches us to turn the negatives into positive affirmatives. It enables a person to attain full potential. Through

this we intend to understand ourselves better and make positive changes inside our world. Keep motivating yourself to make all the changes without any hesitations. This will help you face all circumstances of life.

- Self- improvement gathers abundant confidence within an individual which helps invade the best position in the society. By improving yourself in accordance with every situation you face in life, you could lead a peaceful, happy and indeed a long life.

DID YOU KNOW FACTS!!

- *11% of people are left handed*
- *August has the highest percentage of births*
- *Unless food is mixed with saliva you can't taste it*
- *The average person falls asleep in 7 minutes*
- *A bear has 42 teeth*
- *An ostrich's eye is bigger than it's brain*
- *Most lipsticks contain fish scales*
- *No two corn flakes look the same*
- *Lemons contain more sugar than strawberries*
- *8% of people have an extra rib*
- *85% of plant life is found in the ocean*
- *Ralph lauren's original name was ralph lifshitz*
- *Rabbits like licorice*
- *The hawaiian alphabet has 12 letters*
- *'topolino' is the name for mickey mouse Italy*
- *A lobster's blood is colorless but when exposed to*
- *oxygen it turns blue*
- *Armadillos have 4 babies at a time and are all the*
- *same sex*
- *Reindeer like bananas*
- *The longest recorded flight of a chicken was 13 seconds*
- *Birds need gravity to swallows*