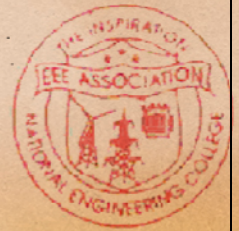




NATIONAL ENGINEERING COLLEGE

(AN AUTONOMOUS INSTITUTION)

K,R,NAGAR,KOVILPATTI-628503.



EEE NEWSLETTER

August 2014
Volume 2 Issue 3

PEO and PO of B.E. (Electrical and Electronics Engineering) Programme

PROGRAMME EDUCATIONAL OBJECTIVES (PEO):

PEO 1 : Excel in industrial or graduate work in Electrical Engineering and allied fields

PEO 2 : Practice their profession conforming to ethical values and active participation in the affairs of the profession

PEO 3 : Adapt to evolving technologies and stay current with their profession

PROGRAMME OUTCOMES:

PO 1 : An ability to apply knowledge of mathematics, physical sciences, and engineering.

PO 2 : An ability to design and conduct experiments, as well as to analyze and interpret data.

PO 3 : An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, health and safety, manufacturability and sustainability.

PO 4 : An ability to identify, formulate and solve electrical engineering problems.

PO 5 : An ability to use the techniques, skills, and modern electrical engineering tools necessary for engineering practice.

PO 6 : Develop an understanding of contemporary technical and professional issues in the practice of electrical engineering.

PO 7 : The broad education necessary to understand the impact of electrical engineering solutions in a global, economic, environmental, and societal context.

PO 8 : An understanding of professional and ethical responsibility.

PO 9 : An ability to function on multidisciplinary teams.

PO 10 : An ability to communicate effectively in a bi-lingual environment.

PO 11 : Recognition of the need for and an ability to engage in life-long learning.

PO 12 : An ability to manage any real time projects.

CONTENTS

PEO and PO.....	02
Department Activities.....	04
Special Interest Group.....	04
Placement Activities.....	07
GATE Forum.....	09
APTITUDE Forum.....	12
Institute of Engineers – IE (INDIA).....	14
Technical Article by Staff Member	15
Technical Articles by Students.....	19
Personality To Know.....	23
Time to know our Alumni.....	24
Do It !!! Know It !!!	26
Chance to Participate	30
Time to Test your Knowledge.....	31
Students Achievements.....	32
Industry Profile.....	33

DEPARTMENT ACTIVITIES

SPECIAL INTEREST GROUP

SIGNAL PROCESSING AND EMBEDDED SYSTEM

A Hands on Training on “EMBEDDED SYSTEM & PIC MICROCONTROLLER” was conducted on 02.08.2014 by **Ms.K.Gowthami, Assistant Professor /EEE** at C&I Lab for Special Interest Group (SIG) members.

Initially she started with definition of embedded system and basics of microprocessors and microcontrollers. She described the hardware parts and the software parts used for embedded system design and demonstrated in the PIC microcontroller board.

Components incorporated in that board as follows:

- PIC microcontroller IC
- Power Supply, Led's
- Seven Segment Display, LCD interfacing
- RS 232 for serial communication
- Dot Matrix Keypad, Real Time Clock IC

She also explained us about MPLAB software which is specially designed for PIC microcontroller. Then we started with practical session. In practical session we learn how to write embedded C coding, assigning input and output variables using I/O ports. The students are divided into several groups and a PIC kit for each group was provided to do following exercises using MPLAB software.

- Driving single LED
- Driving multiple LED's & Serial Display
- Pressing key to drive LED
- Single Channel seven segment display

The session was started by 10.00 AM and completed by 01.00PM. Totally 19 students from final and third year were participated and got the relevant information about embedded system, basics of microprocessor and microcontroller, Programming PIC microcontroller using embedded C.

POWER ELECTRONIOCS AND DRIVES

A seminar on “Hardware Implementation of Power Electronics” was conducted on 02.08.2014 by **Mr.B.Venkatasamy, Assistant Professor /EEE** at Seminar Hall for Special Interest Group (SIG) members. The objectives of today's session are:

- Study of different types of power conversion
- Testing and troubleshooting of power electronic circuits
- Requirements and implementation of firing circuits
- Need of some useful skills for recent trends and web sources

Initially he started with the applications of power electronics and major power electronic device devices and circuits and he gave a brief explain about testing of the various devices and power electronic converters. Then he discussed about the basic and recent types of firing circuits using embedded systems etc. He explained the recent trends in power electronics like SMPS, Application in Renewable energy sources and MPPT etc.

Then he demonstrated and showed a video presentation for MPPT controller and its algorithm in the field of Solar system. Finally, he disused about the required skills for designing a power converters and its triggering circuit with some useful web links.

The session was started by 10.15 AM and completed by 1.00 PM. totally 29 students from final & third year were participated and got the relevant information about the hardware implementation for power electronics circuits.

POWER SYSTEM

A seminar on “Overview of Microgrid and its Configuration” was conducted on 02.08.2014 by **Ms.S.Jayanthi, Assistant Professor /EEE** at Class Room H1 for Special Interest Group (SIG) members. The objectives of today’s session are:

- Recent trends in Distributed generation
- Microgrids architectures and operation
- Effect of Power electronic interfaces with grid
- Recent ongoing research/Challenges and Development on Microgrid

Initially she started with the distributed generation and she gave a brief history about the Microgrids architectures and operation. She also explained the effect of power electronics interfaces with grid. Finally she discussed about the recent trends & ongoing research/Challenges and Development on Microgrid.

The session was started by 10.00 AM and completed by 11.30AM. Totally 17 students from final & third year were participated and got the relevant information about the recent trends in Microgrid.

ENERGY ENGINEERING

A seminar on “Advance Solar Applications” was conducted on 02/08/2014 by **Mr.M.Sivapalanirajan, Assistant Professor /EEE** at Class Room for Special Interest Group (SIG) members.

SESSION 1: 10.30 AM – 11.15 AM

To start with advanced applications, session 1 was filled with the basic operation of the solar cell along with solar cell model. In this the visible light spectrum having varying energy density is explained. This concept is correlated to the existing solar cell design with a curiosity experiment done using solar jar covered with different colored cellophane. The result of the experiment shows the energy extraction from the solar (white light) varies depends on the frequency spectrum.

Advanced solar cell used in space application like triple junction cell made of GaAs (gallium arsenide) architecture was explained along with the comparison of the existing silicon solar cell made of single junction. Various advantages like area consumption, energy utilization and efficiency information of GaAs cell was discussed along with the disadvantages like cost and manufacturing difficulties over Si cell.

The satellite application (CUBESAT) that utilizes the GaAs cell was explained along with the reason why we are selecting them. The efficiency of the cell and the layouts of the panel arrangement in satellite were discussed with the idea of the part played by the electrical engineer in those applications.

SESSION 2: 11.30 AM – 12.45 PM

After a brief introduction about the basic available solar cells and their competency, few project scope oriented to the energy management using solar power was demonstrated. Applications of solar power deals with DC-DC converter and inverter development for the interface of solar with real time equipments were explained.

Then the most important research area of solar power tracking using MPP (maximum power point) was explained with the demonstration graphs showing the clear idea of MPP. The methodologies available to make MPP were also explained.

Direct method of MPPT:

- a) Hill climbing/P&O
- b) Incremental Conductance
- c) Fuzzy Logic Control
- d) Slide Control Method

Indirect method of MPPT:

- a) Curve fitting method
- b) Lookup table method
- c) Fractional OC method
- d) Fractional SC method

Brief idea of each technique was explained for the MPPT and also the impact of parameters like irradiance and temperature on the performance of solar cell was explained by respective graphical demo.

Overall to say, each session were made informative and interactive among the III year students to have the vision of their future projects along with the existing examples designed by engineers for the society.

SOFT COMPUTING TECHNIQUES

A workshop on “TRAINING ON MATLAB” was conducted on 05/07/2014 by **Mrs.R.V.Maheswari, Associate Professor/EEE** and 19/07/2014 by **Dr.M.Willjuice Iruthayarajan, Professor/EEE** at Computer center was organized by Special Interest Group (Soft Computing Techniques) members. The objectives of today’s session are:

- Basics about MATLAB Software
- How to implement simple codings in workspace
- Troubleshooting the Errors

The main objective of the workshop is too impart the basic knowledge about the MATLAB software. Initially the session was started at 10.00 AM and started with the necessity of studying MATLAB software and the importance of Electrical engineer to aware about the recent issues performed by this software in companies. Totally around 60 members were utilized this session. Morning session is fully related to basic mathematical operators executed using MATLAB codings and the session was over by 12.45 PM. Afternoon session was started at 2.00 PM. The session was fully engaged with how to use logical operators using MATLAB codings. The session was over by 5.00 PM.

The feedback provided by the two batches concluded that these classes were very helpful and would help in their projects and placements. It was planned to extend the classes for the remaining students too.

PLACEMENT ACTIVITIES

In this academic year the placement activities in our department started from 01/07/2014.

Mr.S.Venkata Prasad, SAP project consultant and manager, TCS (NEC alumni) was delivered a talk on “How to face the Placement” for all the final year students of our department on 02/07/2014 at college auditorium.

In view of campus recruitment drive for an awareness program can be conducted by Mr.S.Abdul Nazar , Mr.Edwin pattudurai and Ms.A.Selvi Eswari(NEC Alumni's) presently working as a programmer in a reputed company. They will discussed about preparation for campus interview and they shared their interview experiences (Programming skills) with the final year students on 05/07/2014 (10 am – 01 pm). Nearly 60 students of our department have participated in this session and got the programming ideas related with the written test.

The C, C ++ training classes was conducted for final year students from 14/07/2014 to 19/07/2014 in specific periods to facing the written programming test. The classes were handled by CSE (PG) department staff. From those classes the students get some awareness about the programming skills.

There was an exclusive aptitude training and soft skill program was conducted for all/ final year students for 4 days (21/07/2014 -24/07/2014). Trainers from M/S. Smart, Chennai were the resource persons for the program. From that program our students equip themselves to face I.T companies as well as core companies' campus recruitment interview. For that the pre placement test was conducted for the final year students on 18/07/2014 in our department computer lab. Nearly 135 students were taken the test and they realized their skills on aptitude. Most of the student has given the feedback that they may have time management problem on problem solving. After the training program the students are asked to take the post placement test for their improvement.

Native lead foundation, a nonprofit organization working in the start ups support with specific focus to the southern part of tamilnadu was giving an awareness session “SPARK” (A session on innovating Entrepreneurship) to all the pre final year students on 24/07/2014 at college auditorium. The pre final year students have obtained the clear knowledge on entrepreneurship.

To face the IT companies the special C, C++ classes has been arranged for IV EEE A & B during weekdays. The class was handled by the CSE (PG) staff members. Then there was a preliminary programming test has been conducted on 31/07/2014 for 108 students from IV EEE.

An interaction program arranged on our Reunion of 1989 batch alumnus at our college on 09/08/2014. The interaction session was about “Automatic Electronics and Power Electronics” Nearly 50 students from our department participated and they eagerly interacted with our Reunion batch alumnus.

There was exclusive aptitude training and soft skill program was conducted for all pre final year students of our department for 4 days (18/08/2014 -21/08/2014). Trainers from M/S. Face, Coimbatore were the resource persons for the program. From that program our students equip themselves to face I.T companies as well as core companies’ campus recruitment interview.

T.I.M.E institute, Tirunelveli, which is a GATE exam coaching centre has conducted the GATE test for our department students on 24/08/2014 at St.Xavier’s College, palayamkottai. Nearly 40 students from final year and 20 students from pre final year have attended the test and they got some idea about how to face GATE test.

Sl.No	Date	Program conducted	Beneficiaries	No of Participants	Handled By
1	02/07/2014	How to face the Placement	IV EEE A & B	143	Mr.S.Venkata Prasad, SAP project consultant and manager, TCS
2	05/07/2014	Preparation for campus interview	IV EEE A & B	69	Mr.S.Abdul Nazar , Mr.Edwin pattudurai and Ms.A.Selvi Eswari
3	14/07/2014-18/07/2014	C, C ++ training classes	IV EEE A & B	143	CSE(PG) staff
4	21/07/2014-24/07/2014	Aptitude training and soft skill program	IV EEE A & B	143	M/S Smart, Chennai
5	24/07/2014	“SPARK” (A session on innovating Entrepreneurship)	III EEE A & B	137	Native lead Foundations
6	31/07/2014	Pre programming test	IV EEE A & B	108	EEE Department
7	09/08/2014	Automatic Electronics and Power Electronics	IV EEE & III EEE	50	1989 Batch Alumnus
8	18/08/2014-22/08/2014	Aptitude training and soft skill program	III EEE A & B	137	FACE, Coimbatore
9	24/08/2014	Model GATE test	IV EEE & III EEE	60	T.I.M.E institute

Beyond this every week there is special coaching classes for GATE and Aptitude solving skill for final year students and conducting periodic test to access the student’s performance by department GATE and Aptitude Forum.

GATE FORUM

About GATE:

The Graduate Aptitude Test in Engineering (GATE) is an all-India examination that primarily tests the comprehensive understanding of various undergraduate subjects in engineering and science. GATE is conducted jointly by the Indian Institute of Science and seven Indian Institutes of Technology (IIT Bombay, IIT Delhi, IIT Guwahati, IIT Kanpur, IIT Kharagpur, IIT Madras and IIT Roorkee) on behalf of the National Coordination Board – GATE, Department of Higher Education, Ministry of Human Resources Development (MHRD), Government of India. The GATE score of a candidate reflects the relative performance level of a candidate. The score is used for admissions to various post-graduate programs (e.g. Master of Engineering, Master of Technology, and Doctor of Philosophy) in Indian higher education institutes, with financial assistance provided by MHRD and other government agencies. Recently, GATE scores are also being used by several Indian public sector undertakings (i.e., government-owned companies) for recruiting graduate engineers in entry-level positions. It is one of the most competitive examinations in India.

Objectives of GATE

1. To improve the technical skills of students
2. To motivate the students for higher studies as well as placement

Benefits of GATE:

- A good GATE score is helpful for getting admission in to IITs, IISc, IIITs, NITs and many other renowned institutions.
- GATE qualification is also a minimum requirement to apply for various fellowships awarded by many Government organizations.
- GATE qualified candidates are also eligible for the award of Junior Research Fellowship in CSIR laboratories and CSIR sponsored projects.

- Focused GATE preparation also helps in other prestigious PSU recruitment examinations like CIL, AP GenCorp, AP Transco, NTPC, and BSNL etc.

Benefits of M.E./M.Tech:

- M.E./M.Tech from a good institute helps you to stand out from the rest
- M.E./M.Tech opens up a lot of career paths in the fields of Teaching, Research and other Core sectors, apart from the existing alternatives
- Better Placements in top PSUs, MNCs and Indian companies both in India and Abroad.
- A Minimum stipend of 8000/- per month is given to regular students joining colleges under MHRD
- Opportunity to work in research positions like JRFs, in ISRO/DRDO/BARC/IITs etc.
- M.E. /M.Tech gives chance to pursue specializations of interest.

About Online Testing:

Moving assessments online may seem a daunting task; however the benefits online testing provides good motivator for most teachers and instructors. From being able to create banks of questions and tests, to instant calculation and analysis of results, to flexible delivery methods and enriched test material with the ability to add online links, documents, images and videos, the advantages are obvious. Assessing student's learning at regular intervals is crucial in any educational environment. Through regular testing and reviews, instructors and teachers can monitor the progress of each student and then offer further materials and assistance where required. Regular testing not only helps instructors to identify areas of learning weakness within individual students.

Web based exams provide instructors and teachers with a flexible distribution channel that allows students to take tests wherever they may be. A big advantage to online testing is the time that can be saved when results are automatically and instantly calculated and communicated to both instructor and student. Instructors and teachers can then review results in real-time for meaningful analysis. Some systems, including Class Marker, also allow for feedback to be automatically displayed for correct/incorrect answers. When reviewing Class Marker, you will find an easy-to-use

quiz maker that is completely online, or in the 'cloud'. There is no need to worry about downloads, software requirements or regular maintenance. This is all managed by the Class Marker Team. With features such as time limits, instant feedback, add media to questions, accurate grading, the option to charge for your quizzes and many more settings, Class Marker has you covered. It's clear that online testing provides a great many benefits. By choosing the right system for your organization you can save time and improve the learning process.

Advantages of Class Marker.com:

Students:

They can easily attend the tests from their homes.

1. They can write the tests at anytime they want.
2. They can send feedback about the questions during the test time.
3. They can easily view the results through their mails.
4. They can correct themselves through the result analysis.
5. Students need specific and timely feedback on their work - not just a grade. Class marker will satisfy this need.

Staff members:

1. Staff members can monitor the student's progress at each time when they write the exam.
2. Staff members can give more attention to the students who are all got low marks.
3. They can provide various materials as well as question papers so that once they uploaded to the site, they can use any time for any students.
4. The correction and result analysis process is very easy and more time can be saved. This will improve our college effectiveness of using online web sourcing.
5. One of our department's aims is to reduce the paper work and manual correction. Class marker will satisfy this aim.

HOME PAGE: CLASS MARKER

Actions	Name	Percentage	Score	Duration	Date	Statistics
	Average	52.8%	16.2/30	00:20:08		
	BINIL B	-	-			
	DFFPA C	80%	24/30	00:05:47	Wed 23 Jul '14 5:28pm	Answers
	GANESH C	70%	21/30	01:10:16	Sun 20 Jul '14 11:49am	Answers
	BALA D	-	-			
	JENY D	33.3%	10/30	00:16:13	Thu 24 Jul '14 8:26pm	Answers
	ROLL EIGHT	73.3%	22/30	00:44:32	Sat 19 Jul '14 10:38am	Answers

RESULT ANALYSIS PAGE: CLASS MARKER

APTITUDE FORUM

Department of Electrical and Electronics Engineering introduce an Aptitude forum to improving problem solving skill and analytical skill for all the students. In that various topics like Time and Work, Data Arrangement, Numbers, Percentage and Speed distance problems were discussed. Initially the basic related to the topics and some problem solving tricks were discussed by the staff members, after that various problems were taken by the students in the class session.

Apart from that they have undergone a quantitative test on 05/08/2014 for final year students. A comparative result analysis were discussed below,

A test has been conducted on the month of July for all final year students. The result analysis is as follows.

Class	No. of students appeared	15-20 In No's	%	10-15 In No's	%	5-10 In No's	%	Less than 5 In No's	%
Final EEE-A	72	0	0	1	1.38	29	40.27	42	58.33
Final EEE-B	69	0	0	1	14.28	38	55.072	30	43.47

A written examination has been held on the month of august for all final EEE students. The exam paper consists of 20 Quantitative aptitude questions of which the duration is half an hour. The result analysis for the above test is as follows.

Class	No. of students appeared	15-20 In No's	%	10-15 In No's	%	5-10 In No's	%	Less than 5 In No's	%
Final EEE-A	63	0	0	13	20.64	41	65.08	9	14.28
Final EEE-B	67	0	0	6	8.95	37	55.22	22	32.84

Comparative for Final - A

	15-20 (%)	10-15 (%)	5-10 (%)	Less than 5 (%)
July month	0	1.38	40.27	58.33
August Month	0	20.64	65.08	14.28

Comparative for Final -B

	15-20 (%)	10-15 (%)	5-10 (%)	Less than 5 (%)
July month	0	14.28	55.07	23.47
August Month	0	8.95	55.22	32.834

INSTITUTE OF ENGINEERS (INDIA) - STUDENTS

CHAPTER - CODE 628503

The IE (I) students' chapter of our college conducts a bi weekly General Knowledge test for the second year and third year students of our department to enhance their GK during Tuesdays and Wednesdays in the time of 5.15 pm -5.40 pm and the students also utilize the test effectively.

In addition to this, to ease the students in the field of presentation, a Paper Presentation competition was organized exclusively for the second and third year students of our department on 19.08.14 and 20.18.14 under the guidance of our staff convener Mr.M.P.E.Rajamani, AP(SG)/EEE and Mr.M.Gengaraj, AP/EEE. The following students have bagged the top 2 prizes.

S.No	Name of the students	Year	Prize status
1.	M.Muthuselvi	Second B	Winner
	A.Suvetha		
2.	R.Bavithra	Second A	Runner
3.	S.Ramasubramanian	Third B	Winner
	S.Natarajan		
4.	S.Hema	Third A	Runner
	S.Angalapameswari		

The effective participation and the enthusiasm of the students has been a boost to us and we are planning to extend the activities.

Technical Articles by Staff Member

EMBEDDED SYSTEMS – OVERVIEW

N.B.PRAKASH

Staff Coordinator – Special Interest Group (DSP-Embedded Systems)

Associate Professor, EEE Department

National Engineering College

INTRODUCTION:

An embedded system is a computer system designed to perform dedicated functions rather than be a general purpose computer performing multiple tasks. Embedded system controls many devices like cameras, mobile phones, audio players, etc. Embedded system combines all mechanical, electrical, and chemical components along with an integrated chip hidden inside to perform the designed target. Embedded system is controlled by one or more main processing cores [IC's] usually microprocessor or microcontroller or digital signal processor and recently introduced is the Application Specific System Processors [ASSP]. Embedded system has become a ubiquitous component of our every day's life. Hence training the engineering student's workforce to develop and manage the products based on embedded controllers is important.

Features of Embedded Systems:

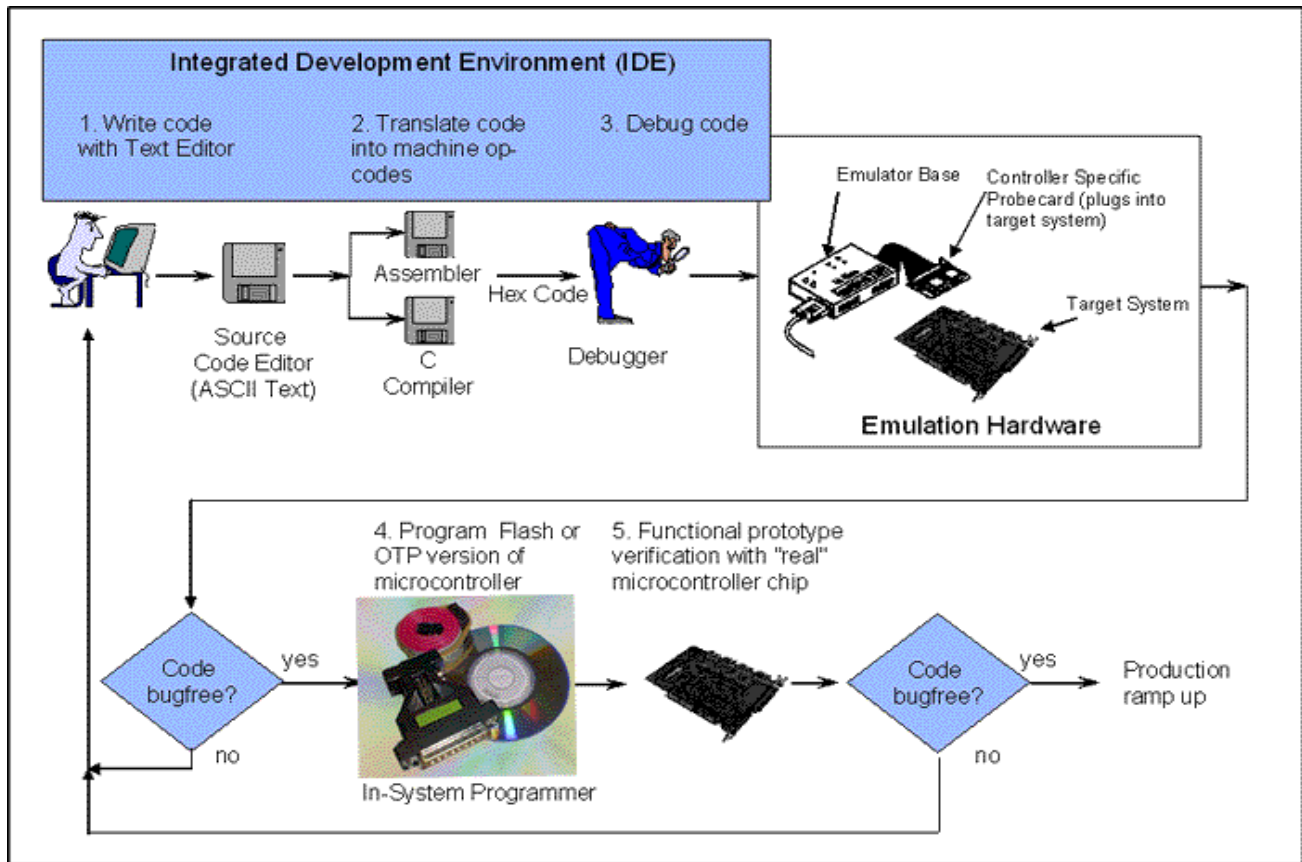
1. Simplification in development and manufacture
2. Specific Computer Programs combines software and hardware
3. It's a programmed hardware devices
4. Reduction in cost and facilitates mass production
5. Perform repeated functions for long periods without failing
6. High efficiency and have RTOS (Real Time Operating System)
7. Reliability, Safety and can have hybrid behavior

Design and Developing Embedded System:

Design and developing of software and hardware for microcontroller based systems (embedded) is shown below which involves the use of range of software tools which include

1. *Editor*
2. *Assemblers or Compilers*

- 3. *Debuggers*
- 4. *Simulators*
- 5. *Emulators*
- 6. *Flash / OTP Programmings*



The Microcontroller Development Cycle

Thanks to Mr.Volker Soffel, General Manager, Microcontrollerchip.com

Description - Software Modules and Tools for designing of embedded system

<p>Editor</p>	<p>For writing C codes or assembly mnemonics using the keyboard of the PC for entering the program. Allows the entry, addition, deletion, insert, appending previously written lines or files, merging record and files at the specific positions. Creates a source file that stores the edited file. It also has an appropriate name [provided by the programmer].</p>
<p>Interpreter</p>	<p>For expression-by-expression (line-by-line) translation to the machine executable codes.</p>

Compiler	Uses the complete sets of the codes. It may also include the codes, functions and expressions from the library routines. It creates a file called object file.
Assembler	For translating the assembly mnemonics into binary opcodes (instructions), i.e., into an executable file called a binary file. It also creates a list file that can be printed. The list file has address, source code (assembly language mnemonic) and hexadecimal object codes. The file has addresses that adjust during the actual run of the assembly language program.
Cross Assembler	For converting object codes or executable codes for a processor to other codes for another processor and vice versa. The cross-assembler assembles the assembly codes of target processor as the assembly codes of the processor of the PC used in the system development. Later, it provides the object codes for the target processor. These codes will be the ones actually needed in the finally developed system.
Simulator	To simulate all functions of an embedded system circuit including additional memory and peripherals. It is independent of a particular target system. It also simulates the processes that will execute when the codes execute on the targeted particular processor.
Source-code	For source code comprehension, navigation and browsing, editing, debugging, configuring Engineering Software (disabling and enabling the C++ features) and compiling.

Classification of Embedded Systems:

The embedded systems are classified into three types as follows.

1. Small Scale Embedded Systems
2. Medium Scale Embedded Systems
3. Sophisticated / Large Scale Embedded Systems

Small Scale Embedded Systems:

1. Designed with single 8 or 16 bit microcontroller
2. Little hardware and software complexities involve board level design

3. Battery Operated and C-Program is used for developing the systems

Medium Scale Embedded Systems

1. Designed with few 16 or 32 bit microcontroller or DSP or Reduced Instruction Set Computers (RISC)
2. Have both hardware and software complexities
3. Integrated Development Environment (IDE)

Sophisticated / Large Scale Embedded Systems

1. Designed with single 32 bit microcontroller
2. Enormous hardware and software complexities
3. Need scalable processor or configurable processor and programmable logic arrays.
4. TCP/IP protocol stacking and network driver function are implemented in the hardware to obtain additional speeds by saving time.

Embedded System Applications:

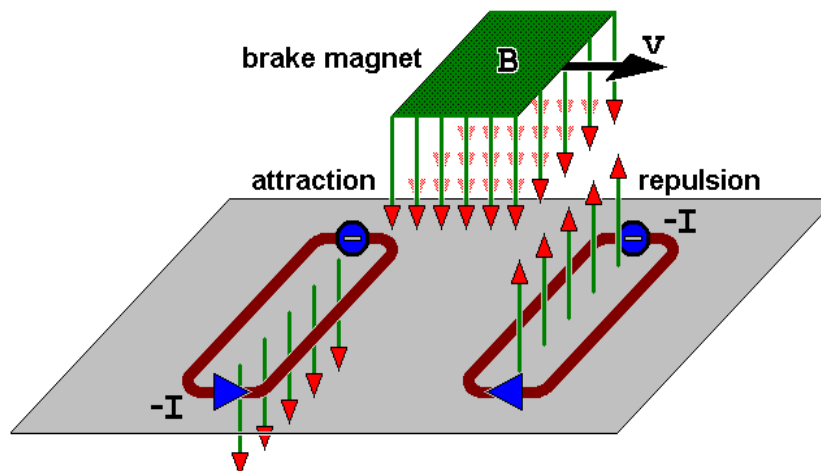
1. Biomedical Instrumentation: ECG Recorder, Blood Cell Recorder, Patient Monitoring System etc..
2. Communication System: Pager, Cellular Phones, Cable TV Terminals, FAX, Trans-receivers, video games and so on
3. Peripheral Controllers of a Computer: Keyboard, DRAM, DMA, Printer, LAN Controller etc..
4. Industrial Instrumentation: Process control, DC motor control, Robotic system, CNC machine controller and industrial moisture recorder etc..
5. Scientific: DSO, CRT display controller and spectrum analyzer

As an Engineering Student, one should know how to

1. Design algorithms (control, signal processing) that will be implemented on embedded microprocessors.
2. Selection of microprocessor type / microcontroller to be used in embedded applications.
3. Selection of the software tools (RTOS) for the embedded market.
4. Develop coding either low level or high level languages.
5. Pile up the coding / program into the chip to work along with hardware.
6. Attain the defined specific task.

Technical Articles by Students

Eddy Current Brakes



Many of the ordinary brakes, which are being used now a day's stop the vehicle by means of mechanical blocking. This causes either skidding or wears and tears of the vehicle. And if the speed of the vehicle is very high, the brake cannot provide that much high braking force and it will cause problems. These drawbacks of ordinary brakes can be overcome by a simple and effective mechanism of braking system 'The eddy current brake'. It is an abrasion-free method for braking of vehicles including trains. It makes use of the opposing tendency of eddy current. Eddy current is the swirling current produced in a conductor, which is subjected to a change in magnetic field. Because of the tendency of eddy currents to oppose, eddy currents cause energy to be lost. More accurately, eddy currents transform more useful forms of energy such as kinetic energy into heat, which is much less useful. In many applications, the loss of useful energy is not particularly desirable. But there are some practical applications. Such an application is the eddy current brake.

Electromagnetic brakes are similar to electrical motors; non-ferromagnetic metal discs (rotors) are connected to a rotating coil, and a magnetic field between the rotor and the coil creates a resistance used to generate electricity or heat. When electromagnets are used, control of the braking action is made possible by varying the strength of the magnetic field. A braking force is possible when electric current is passed through the electromagnets. The movement of the metal through the magnetic field of the electromagnets creates eddy currents in the discs. These eddy currents generate an opposing magnetic field (Lenz's law), which then resists the rotation of the discs, providing braking force.

- Jenifar.A, Prefinal year

Smart Power Generation



We live in an electric world. With almost everything today running on electricity, it is easy to forget our dependence on that power source, and the reliability of its production. It is only when we have a power failure – as happened during the writing of this because of a thunder storm – that we become aware of the utmost importance of having electricity whenever needed, i.e. always. 40 years ago, in the early 1970s, 90% of global energy production was based on fossil fuels. Today, it remains at 85%. Is there some way of possibly lowering that percentage to zero during the coming 40 years? Unfortunately, even without the additional demands set by population growth and expanding economies, a technical solution to totally substitute fossil fuels with other sources of energy does not exist today. This is a fact, regardless of how crucial the environmental issues may be, especially the global climate change

Limiting climate change, therefore, calls for finding means to diminish the effects of emissions from fossil fuels, and to decrease the amount of carbon dioxide entering the Earth's atmosphere. One way of doing this is to increase the use of renewable energy sources, which has been on the agenda for some time now. Another way is to make the use of fossil fuels carbon-free – or at least as carbon-free as possible. Since coal accounts for about 40% of current global electricity generation and emits the highest amount of CO₂ among fossil fuels, the emphasis must lie on coal power plants

RENEWABLES

The significance of renewable energy sources, for example wind power, is rapidly increasing. From an environmental point of view, this is good news, but, unfortunately, there are limits to this development.

The greater the amount of renewable power there is in the overall generating portfolio, the more likely it is that the big power plants must dramatically reduce or increase their electricity production. Steam power plants, which make up the majority of traditional, existing power plants, may take hours to cease producing power when it is not needed, and an even longer to restart. This creates the potential for damage costs in the hot parts of the boilers, and seriously impacts fuel efficiency.

Future power systems need rapidly adjustable capacity equal to the installed capacity of wind power. Some of the capacity may be a bit slower to react, some must be very agile and capable to start and stop within minutes. This is a dilemma, but is not entirely solved.

Smart Power Generation is the next best option.

SMART POWER GENERATION

Because of the very different conditions in different parts of the world, there is no single, simple solution for the challenges of producing electricity to meet the ever-increasing demand for power. There has to be a set of alternative solutions from which to choose according to the local conditions. This is where Smart Power Generation comes in. It provides the set of solutions needed now, and even more so in the low-carbon future.

Smart Power Generation consists of a number of similar, individually dispatch able high-performance generating units installed in parallel. Each unit is capable of running independently, starting, stopping, loading and regulating the output. The possible failure or maintenance activity of one single unit will not affect the other units or plant output remarkably.

Smart Power Generation has a rapidly adjustable output capable of matching the variable demand for electricity, and able to compensate for the fluctuating power output of the renewable sources. The starting time from zero to full load is 5 minutes, and stopping from full load takes just 1 minute. This can be repeated an unlimited number of times per day without any adverse impact on maintenance schedule or costs.

Smart Power Generation can be run on natural gas as well as liquid and gaseous renewable fuels, always with similar high efficiency. In fact, the Smart Power Generation combustion engines offer the highest simple cycle efficiency of any thermal technology in the world

Nothing is more difficult than predicting the future, but this new technology enables decisions to be made based on the economic and technological development having the potential to surprise even the most sceptical. Smart Power Generation enables a reliable transfer to a power system that includes a considerable amount of wind power.

Smart Power Generation is the road to the future.

- Bala Murugan. P, Prefinal Year

PERSONALITY TO KNOW

JOHN BARDEEN

John Bardeen was born in Madison, Wisconsin, on May 23, 1908. He enrolled at the University of Wisconsin when he was 15 and majored in engineering, later getting his master's in engineering at UW as well. He ended up accepting a position with Gulf Oil as a geophysicist. After three years, Bardeen realized that his interests lay elsewhere and he went back to school, this time to Princeton for his Ph.D. in mathematical physics. At Princeton, Bardeen began his serious studies of metals under Professor E.P. Wigner, using new theories of quantum mechanics to help further understanding of semiconductors. He finished his dissertation in 1935 and was offered a junior fellow position at Harvard, where he spent the next three years.

He was the only person to have won the Nobel Prize in Physics twice: first in 1956 with William Shockley and Walter Brattain for the invention of the transistor; and again in 1972 with Leon N Cooper and John Robert Schrieffer for a fundamental theory of conventional superconductivity known as the BCS theory. The transistor revolutionized the electronics industry, allowing the Information Age to occur, and made possible the development of almost every modern electronic device, from telephones to computers to missiles. Bardeen's developments in superconductivity, which won him his second Nobel, are used in Nuclear Magnetic Resonance Spectroscopy (NMR) or its medical sub-tool magnetic resonance imaging (MRI). Superconductivity is a phenomenon of exactly zero electrical resistance and expulsion of magnetic fields occurring in certain materials when cooled below a characteristic critical temperature. BCS theory is the first microscopic theory of superconductivity since its discovery in 1911. The theory describes superconductivity as a microscopic effect caused by a condensation of Cooper pairs into a boson-like state. The theory is also used in nuclear physics to describe the pairing interaction between nucleons in an atomic nucleus. Focusing on such areas as electrical conduction in semiconductors and metals, and surface properties of semiconductors, Bardeen was elected to the National Academy of Sciences in 1954. Bardeen died due to heart disease at Massachusetts, on January 30, 1991.

John Bardeen: "Science is a field which grows continuously with ever expanding frontiers."

- M. Pranava Karthikeyan (Prefinal Year EEE)

TIME TO KNOW OUR ALUMNI

M.K. ASSAN FAKKIR

Email: assan.fakkir@gmail.com

Ph: 98437 89846

Passed out: 2010 Batch

Current Working Status: TCS



EDUCATIONAL DETAILS

He completed his schooling at Pushpalata Matric. Hr. Sec, School, Palayamkottai with 83% in 2006. After that he completed his B.E - Electrical and Electronics Engineering in National Engineering College at 2010 with 82%.

MILESTONE

- ✓ He scored 91.67 % in GATE 2010.
- ✓ He scored 86 % in GATE 2013.

SOFTWARE EXPERIENCES:

Software/Language	Experience
TIBCO BW v5.8 (JDBC, SOAP, XML,JMS)	3.5 YEARS
Tibco EMS v5	2 YEARS
Oracle PLSQL 10g	2 YEARS
UNIX shell scripting	2.5 YEARS
Netezza DB	2 YEARS

ACHIEVEMENTS IN THE PROJECTS:

1. He is one of the **KEY RESOURCE** of my team, having good business knowledge of the client and the project. He has been chosen for **two consecutive times** as the key resource of the team.

2. **CYCLE TIME REDUCTION:** He have a made a processing time reduction of a process which runs for 13 hours. After he fix, the process just runs only 2 mins. This was appreciated from client level and nominated for Cycle Time Reduction award.
3. **DIGITAL DATA MODEL:** Since his project uses N number of inputs to deliver various functionalities for various clients, the entire team has a grey area on the data model. Even if we prepare a data model in an excel sheet, it will be hard to track the flow of data in the system. He came up with a digital model, which just shows the data flow in a graphical interface. This was widely appreciated at all levels of clients and the TCS officials. The comment was “*We haven’t seen such thing before. We need it to be implemented to all the projects*”
4. **NEW ENVIRONMENT STANDUP:** The project he work for has a huge list of technologies and tools being used e.g., Datastage, Tibco BW, PLSQL, Oracle, Netezza, UNIX shell scripts, etc. There are many code bases which intercommunicate to deliver the client need. To make a new environment stand up, team takes much pain to accomplish it. He stood a new environment in a time of 3 weeks while the development team with experts on each area takes at-least 4 to 6 weeks. *The task was appreciated by the clients and TCS managers as an outstanding accomplishment.*
5. **ON THE SPOT AWARD :** The Nielsen Director awarded me with “On the Spot award” for my **continuous support to Testing team and also for standing up a whole new environment** all alone in a month time.

DO IT!!! KNOW IT!!!

A. Anto Sharon Prakash - Prefinal Year

SECRETS BEHIND A STATIC MACHINE

Right from our childhood, when we are walking along the roadside, in villages and cities, except some areas we would be amazed to see a big machine with wires entering and exiting. It would be surrounded by fences with placard carrying words "Caution: DANGER". Sometimes men shall arrive and make some arrangements with lever in that machine and the electrical energy supply to the whole village or area would be put down. When we asked him about it, he would say that he had shut down the transformer. What is a transformer? A natural question will soon arise in our mind then. So to understand the secret behind, let us try out the following model. For that we require

1. E shaped core
2. Copper wires for winding
3. Bobbin
4. Insulating sheet
5. Loads like light bulb, etc

SELECTION:

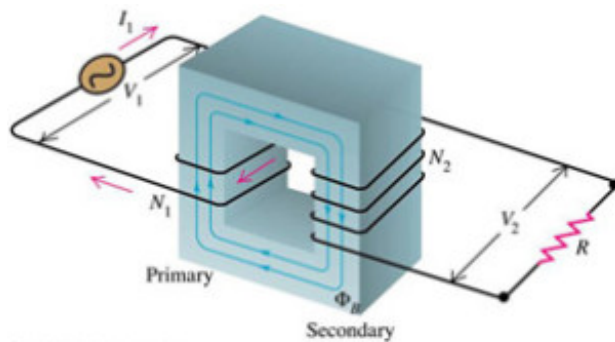
We know that understanding and solving simpler problems in our life, will build confidence and lead us to solve even difficult problems. Having this in mind, the selection of transformer is made. Understanding the simple principle behind the machine 'TRANSFORMER' will build confidence, kindle our knowledge and make us reveal the unrevealed mysteries in our surroundings as Scientists, who discover the world.

LAW: FARADAY'S LAW OF ELECTROMAGNETIC INDUCTION

PRINCIPLE BEHIND (written by Eric Berg, Mechanical Engineering Senior, Colorado School of Mines):

A transformer is an electrical device used to convert AC power at a certain voltage level to AC power at a different voltage, but at the same frequency. The construction of a transformer includes a ferromagnetic core around which multiple coils, or windings, of wire are wrapped. The input line connects to the 'primary' coil, while the output lines connect to 'secondary' coils. The alternating current in the primary coil induces an alternating magnetic flux that 'flows' around the ferromagnetic core, changing direction during each electrical cycle. The alternating flux in the core in turn induces an alternating current in each of the secondary coils. The voltage at each of the secondary coils is directly related to the primary voltage by the turns ratio, or the

number of turns in the primary coil divided by the number turns in the secondary coil. For instance, if the primary coil consists of 100 turns and carries 480 volts and a secondary coil consists of 25 turns, the secondary voltage is then: $\text{secondary voltage} = (480 \text{ volts}) * (25/100) = 120 \text{ volts}$ A transformer may have multiple secondary coils to feed a number of electrical loads; however, power must be conserved, so the sum of the output power must equal the sum of the input power minus losses. Energy losses in transformers are due to a number of factors: these are copper losses in the coils themselves due to material resistance, core losses due to hysteresis (the reluctance of the material's magnetic domains to reverse during each electrical cycle), and eddy currents.



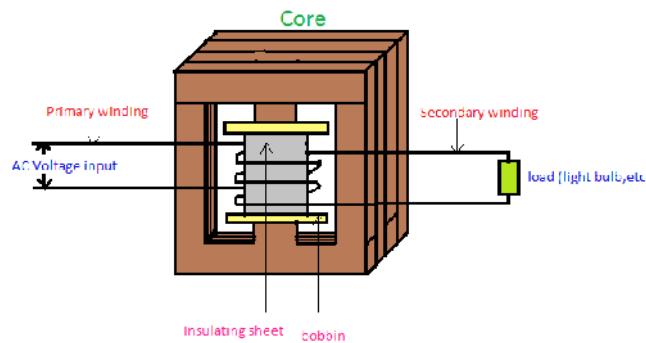
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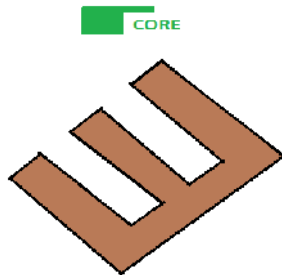
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What are you going to do?

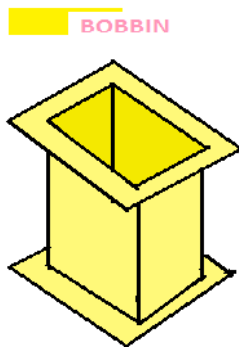
1. To construct the transformer.
2. To check the voltage across the primary and secondary winding.
3. To analyze for drawbacks.
4. To think about any modifications.

MODEL DIAGRAM:

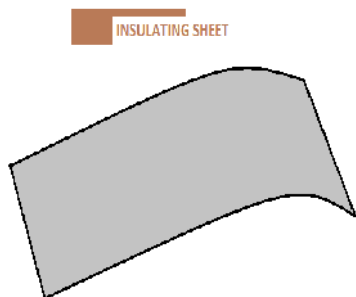


MODEL TRANSFORMER COMPONENTS EXPLANATION:

The emf in secondary winding is induced by flux linkages from the primary coil. Here to link the flux in the primary winding with the secondary winding core is used. The flux lines pass through the core to the secondary winding with some leakage flux.



The primary and secondary windings are wound over the bobbins so that no short circuit condition is made with the core.



These sheets are used to separate primary winding from secondary winding and from core.



Copper wires are necessary through which current enters the transformer and the output is obtained, so as to supply the load.

NOTE:

1. Design of transformer is quite complex. It employs lot of formulae.
2. Before connecting the transformer to the supply, check thoroughly once for any wrong connections.
3. Do with almost care as it involves direct AC supply and use testers before touching any parts after the supply has been given.
4. Only AC supply should be given. If DC supply is given the coils would be burnt.
5. Provide proper insulation for the copper wire, after taken out from the core.
6. Only one type of transformer is provided here. But many different types are available.

Do you observe any voltage difference between primary and secondary coils with turn's ratio greater than one? Try to answer this question.

CHANCE TO PARTICIPATE!!!

EVENT NAME	COLLEGE NAME	DATE	DEPT	LINK
Modeling of Semiconductor devices and sensors - Technical Symposium	Manonmaniam sundaranar University	11.12.14	Common to all	http://www.technicalsymposium.com/technicalsymposium2014_aug_Modeling.html#.U_3kgMWSyKs
ALCONESY-2K14 - Technical Symposium	Alagappa Chettiar College of Engineering and Technology, Karaikudi-	2.9.14 & 3.9.14	EEE	http://www.technicalsymposium.com/technicalsymposium2014_july_ALCONESY.html#.U_3j5sWSyKs
ECSTASY'14 Technical Symposium	Francis Xavier Engineering College, Tirunelveli	27.9.14	EEE	http://www.technicalsymposium.com/technicalsymposium2014_july_Xavier.html#.U_3lacWSyKs
ESPERENZA-2k14 Technical Symposium	Alagappa Chettiar College of Engineering & Technology, Karaikudi	1.10.14	EEE	http://www.technicalsymposium.com/technicalsymposium2014_aug_ESPERANZA.html
PRAGYANZ'14 Technical Symposium	Alagappa Chettiar College of Engineering & Technology, Karaikudi	11.9.14	Common to all	http://www.technicalsymposium.com/technicalsymposium2014_aug_Pragyanz.html

TIME TO TEST YOUR KNOWLEDGE

1. Who composed the famous song 'Sare Jahan SeAchha'?

Mohammad Iqbal

2. Which painter is most famous for his portraits of Napoleon?

Jacques-Louis David

3. Who was India's first Olympic football team captain?

Talimeran Ao

4. Who holds the record for most catches by an Indian player in an innings?

M.S.Dhoni (Six catches against New Zealand in Wellington in April 2009.)

5. Who has won the most directing Academy Awards?

John Ford (4 times)

6. From which year Indian government started sponsoring National Film Awards?

1973

7. Which is the first English newspaper in India?

The Bengal Gazette

8. Which is the first fort constructed by British in India?

Fort St. George

9. Who got Bharat Ratna Award before becoming President of India?

Dr. Zakir Hussain

10. What was the name of the Cuban President over thrown by Fidel Castro in 1959?

Fulgencio Batista

- Subashini. C, Prefinal Year

Students Achievements

NAME	PAPER TITLE/ EVENT	COLLEGE	DATE	PRIZE/ PARTICIPATION
III - YEAR 'A' and 'B'				
Natarajan. S, Suresh Kumar.P, Ramasubramanian. S Kesavamani. M, Gopal. M, Mohamedsuhail. S, Karthika. C, Maheswari. N and Nagalakshmi. P	Android and its application	National Engineering College, IEEE Student Chapter	02.08.2014	Participation
Shanmugam. P and Sathianarayanan. M	Real Time Implementation of Railway Track Fault Detecting System	Sai Ram Institute of Technology, Chennai	23.08.2014	I st prize

- Shanmugam. P and Sathya. P from III 'B' were participated in the ICTACT Youth Talk 2014 held at Syed Institute of Technology in 06.08.2014. Out of that Shanmugam.P was selected in regional level.
- Shanmugam. P was participate in ICTACT Youth presentation Regional Final 2014 at SCAD College of Engineering, Tirunelveli in 07.08.2014

INDUSTRY PROFILE

HEWLETT-PACKARD COMPANY OR HP :

Hewlett-Packard Company is an American multinational information technology corporation headquartered in Palo Alto, California, United States. It provides hardware, software and services to consumers, small- and medium-sized businesses (SMBs) and large enterprises, including customers in the government, health and education sectors. In 1939, Packard and Hewlett established Hewlett-Packard (HP) in Packard's garage with an initial capital investment of US\$538.



Of the many projects they worked on, their very first financially successful product was a precision audio oscillator, the Model HP200A. Their innovation was the use of a small incandescent light bulb (known as a "pilot light") as a temperature dependent resistor in a critical portion of the circuit, the negative feedback loop which stabilized the amplitude of the output sinusoidal waveform. This allowed them to sell the Model 200A for \$54.40 when competitors were selling less stable oscillators for over \$200. The Model 200 series of generators continued until at least 1972 as the 200AB, still tube-based but improved in design through the years.

HP produces lines of printers, scanners, digital cameras, calculators, PDAs, servers, workstation computers, and computers for home and small-business use; many of the computers came from the 2002 merger with Compaq. HP as of 2001 promotes itself as supplying not just hardware and software, but also a full range of services to design, implement, and support IT infrastructure.

HP's Imaging and Printing Group (IPG) is "The leading imaging and printing systems provider in the world for printer hardware, printing supplies and scanning devices, providing solutions across customer segments from individual consumers to small and medium businesses to large enterprises". Products and technology associated with IPG include:

CEO: Meg Whitman

Headquarters: Palo Alto, CA, United States of America

Founded: January 1, 1939, Palo Alto, California, United States

Founders: David Packard, William Redington Hewlett

HP PRODUCTS:

- Inkjet and LaserJet printers
- Officejet all-in-one multifunction printer/scanner/faxes
- Designjet and Scitex Large Format Printers
- Indigo Digital Press
- HP Web Jetadmin printer management software
- HP Output Management suite of software
- LightScribe optical recording technology
- HP Photosmart digital cameras and photo printers
- Snapfish by HP, a photo sharing and photo products service.

HP's Office of Strategy and Technology has four main functions:

1. Steering the company's \$3.6 billion research and development investment.
2. Fostering the development of the company's global technical community.
3. Leading the company's strategy and corporate development efforts.
4. Performing worldwide corporate marketing activities.

EEE NEWSLETTER

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