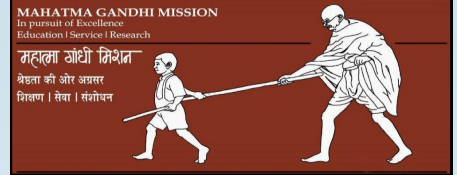


# ELECTRICA MAGAZINE

# ELECTRICAL ENGINEERING DEPARTMENT

## MGM's POLYTECHNIC, AURANGABAD

Academic Year: A.Y. 2018-19, 25-02-2019



### VISION

To develop competent electrical engineer acting as an asset for industry and society

### MISSION

- To disseminate knowledge by providing curricular and co-curricular activity
- To create technical manpower by interacting with industry
- To enrich the students with social awareness to serve the society.



### What is in this issue?

- Research Activity in Department
- FDP
- Industrial Visit
- Expert Lecture
- Visio-Polytech 2k19
- Technical Article's

## RESEARCH ACTIVITY IN DEPARTMENT

## Novel Design Of Breather By Using Heating Coil & Filter Disc With Implementation Of Humidity Sensor & Protective Relay Circuit

**Abstract:**

Above the transformer main tank there is one cylindrical drum called CONSERVATOR in that conservator there is small opening from that opening one bent pipe is attached. And at the end of that bent pipe one small cylindrical material is present that material is called BREATHER. BREATHER is basically a cylindrical vessel in which silica gel (Best adsorbent) is present through which non-moist air flow occurs in the transformer. In our proposed system we are using instead of silica gel we are using heating coil to remove the moisture content from air. We are also implementing one filter disc to remove dust particle from air, in this novel system we are using humidity sensor at the outlet pipe of breather that sensor output is connected to 8051 microcontroller which will command to relay circuit to trip the transformer if humidity level exceeds as well as on protective electromagnetic valve to close inlet pipe of breather.



**Prof. Y. U. Rathod**  
(H.O.D.)  
Electrical Engineering



**Prof. M. M. Bhavsar**  
(Lecturer)  
Electrical Engineering

*“One best book is equal to a hundred good friends, but one good friend is equal to a library” - Abdul Kalam*

## Automatic dust cleaning of solar panel with night sensing auto turn off mode

**Abstract:**

Some of the best places to collect solar energy are also some of the dustiest on Earth. Dust from pollution and traffic that fall on the solar panel surface prevents the sunlight from reaching the solar cells. The efficiency of solar panel gets affected in the presence of dust particles. While many factors affect how much electricity your solar panels will produce, dusty solar panels can be one of the biggest, and easiest to fix. Experts have agreed that dusty solar panels do not produce as much power as clean panels. The power output of the panel degrades up to 50% due to the dust accumulation. A solar panel cleaning system is proposed in order to make a solar panel operate at the best power generation state, while the solar panel is used in a dusty environment. This project consists of an LDR sensor, wiper unit, and sprayer. The LDR sensor is used to detect whether it is day or night and detect dust. Depending on the solar output, the presence of dust on the surface of solar is detected. If the dust is detected, the wiper starts to work on the surface along with the water sprayer.



**Prof. Y. U. Rathod**  
(H.O.D.)  
Electrical Engineering



**Prof. M. M. Bhavsar**  
(Lecturer)  
Electrical Engineering



**Prof. M. S. Jadhav**  
(Lecturer)  
Electrical Engineering

## Energy audit of an industry & solution on energy wastage according to variable load analysis

### Abstract:

India is a developing country and electrical energy consumption by industries is about 60% of the total energy consumption. The industrial development in the country is progressing at a fast pace due to the increase in the number of industries, the gap among demand and supply of electricity is also increasing continuously. To minimize this gap the perfect solution is to conduct is energy audit of all industries on frequent bases. The energy audit will determine energy wastage and losses, and provide techniques and ways to minimize the losses. The energy consumption by different ways suggested by the energy audit will not only decrease the losses but also reduce monthly electricity bill. This paper suggests ways and means to conduct an energy audit in an industry.



**Prof. Y. U. Rathod**  
(H.O.D.)  
Electrical Engineering



**Prof. M. M. Bhavsar**  
(Lecturer)  
Electrical Engineering

*“Thinking Should become your CAPITAL ASSET, no matter Whatever ups and downs You Come across in your Life” - A.P.J. Abdul Kalam*

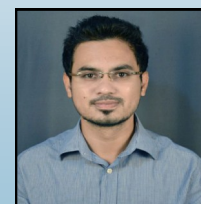
## Novel Design Of Buchholz Relay By Implementation Of Capacitive Liquid Level Transducer

### Abstract:

Transformer is an costly and one of the most essential electrical machines. A Buchholz relay is used to monitor large transformers for oil loss or insulation breakdown. The location of relay is in an inclined pipe between the transformer and its oil conservation tank (located above the transformer). The Buchholz Relay is used as a protective device sensitive to the effects of a dielectric failure inside the equipment. However, the Buchholz relay has a few disadvantages. The relay produces a trip signal during earthquakes and is costly as well. Thus it is generally used only in the protection of power transformers. This paper suggests modern and adaptive methods which are cheaper, efficient and robust. An additional merit is the Control signal (it can be controlled directly from the control room). In this method we are implementing capacitive liquid level sensor to sense fault in transformer which having interfacing with 8051 microcontroller that will give command to relay. The main advantage of these methods is that the relays are easy to manufacture for different sizes of transformers and controlling in this method are outside the chamber containing the oil.



**Prof. M. M. Bhavsar**  
(Lecturer)  
Electrical Engineering



**Prof. Y. U. Rathod**  
(H.O.D.)  
Electrical Engineering



**INDUSTRIAL VISIT**



**Electrical dept. 3rd year under EDP @ jnec**

Aug.23,2018



YouCam

**VISIT LOCATION:** MGM'S KHADI , MGM's CAMPUS , N-6, CIDCO ,  
AURANGABAD

**DATE & SHEDULE:** 23-8-2018 (1 DAYS)

**LEARNING OBJECTIVES:**

- Different process of textile industries
- Process of making paithanies

**INDUSTRIAL VISIT**



**Electrical dept visit under ECA @ MGM hospital**

Aug.25,2018



YouCam

**VISIT LOCATION:** MGM'S HOSPITAL , MGM's CAMPUS , N-6, CIDCO ,  
AURANGABAD

**DATE & SHEDULE:** 25-8-2018 (1 DAYS)

**LEARNING OBJECTIVES:**

- Identify need and importance of renewable energy sources like solar photovoltaic, solar thermal, etc.
- Apply concept of renewable energy for energy generation
- Generation of electricity with one time investment with minimum running expense





## VISIT TO HPS, MSPGCL, PAITHAN

Aug.11,2018



**VISIT LOCATION:** HYDRO POWER STATION MSPGCL, PAITHAN

**DATE & SHEDULE:** 11-8-2018 (1 DAYS)

**LEARNING OBJECTIVES:**

- Process of generation electrical energy using source as a water.
- Know about function and working of component of HPS like DAM, HEAD WORKS, SPILLWAYS, PENSTOCK, TURBINE, ALTERNATOR
- Study of Different Type of turbine.

**INDUSTRIAL VISIT**



**ICAP PUNE INDUSTRIAL VISIT**

Feb.16,2019



YouCam

**VISIT LOCATION:** INNOVATIVE CENTER FOR AUTOMATION PEOPLE, PUNE

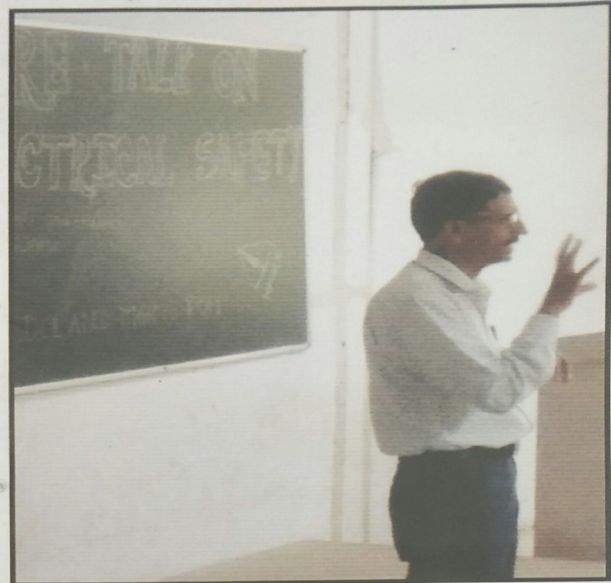
**DATE & SCHEDULE:** 16-02-2019 (1 DAYS)

**LEARNING OBJECTIVES:**

- To Know About Basic Concepts About industrial process and control



**EXPERT LECTURE TALK**



**"ELECTRICAL SAFETY"**

Jul.12,2018



**LECTURE TALK TOPIC: ELECTRICAL SAFETY**

**DATE & SCHEDULE: 12-7-2018 (1 DAYS)**

**LEARNING OBJECTIVES:**

- To know about Electrical Safety Norms
- Study of Protective devices
- Causes of electrical accident and their precaution



**EXPERT LECTURE TALK**



**ENERGY CONSERVATION & AUDIT**

Sep.04,2018



YouCam

**LECTURE TALK TOPIC:** Energy Conservation and audit

**DATE & SHEDULE:** 04-9-2018 (1 DAYS)

**LEARNING OBJECTIVES:**

- To Know About Energy Saving And Audit Concepts And Its Importance

**EXPERT LECTURE TALK**



**FUNDAMENTALS OF POWER ELECTRONICS**

Sep.14,2018



YouCam

**LECTURE TALK TOPIC:** FUNDAMENTAL OF POWER ELECTRONICS

**DATE & SHEDULE:** 14-9-2018 (1 DAYS)

**LEARNING OBJECTIVES:**

- To Know About Basic Concepts About Power Elctronics And Its Recend Trends



**EXPERT LECTURE TALK**



**INDUSTRIAL PROCESS AND CONTROL**

Jan.08,2019



YouCam

**LECTURE TALK TOPIC:** Industrial Process And Control

**DATE & SHEDULE:** 08-1-2019 (1 DAYS)

**LEARNING OBJECTIVES:**

- To Know About Basic Concepts About industrial process and control

**EXPERT LECTURE TALK**



**LECTURE TALK TOPIC:** Industrial Measurements And Control

**DATE & SHEDULE:** 24-1-2019 (1 DAYS)

**LEARNING OBJECTIVES:**

- To Know About Basic Concepts About industrial Measurements and control



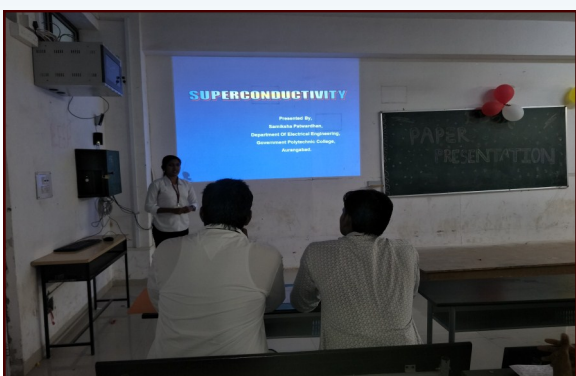
**VISIO POLYTECH 2K18**



**TECHNICAL QUIZ COMPETITION**



**POSTER PRESENTATION COMPETITION**



**PAPER PRESENTATION COMPETITION**



**SARSWATI PUJAN OF EVENT**



**PROJECT COMPETITION**

It is a state level technical event in which every year we organize various technical events. This year Visio-Polytech 2K19 consist of Four events in department namely Project Competition, Paper Presentation, Poster Presentation, Quiz Competition.

This event is specially designed for Junior college, ITI and Polytechnic students. This event helps to bring the students together across the state and promotes innovative and latent qualities in them. Visio-Polytech 2k19 is a platform where students pave ways to their creativity by showing their presentation skills.

## TECHNICAL ARTICLE'S

## Georg Ohm's Discoveries



Georg Ohm, German mathematician and physicist, began his important publications in 1825. In his first paper published in 1825, Ohm examines the decrease in the electromagnetic force produced by a wire as the length of the wire increased. The paper deduced mathematical relationships based purely on the experimental evidence that Ohm had tabulated

In two important papers in 1826, Ohm gave a mathematical description of conduction in circuits modelled on Fourier's study of heat conduction. These papers continue Ohm's deduction of results from experimental evidence and, particularly in the second, he was able to propose laws which went a long way to explaining results of others working on galvanic electricity. The second paper certainly is the first step in a comprehensive theory which Ohm was able to give in his famous book published in the following year

What is now known as Ohm's law appeared in this famous book **Die galvanische Kette, mathematisch bearbeitet (1827)** in which he gave his complete theory of electricity. The book begins with the mathematical background necessary for an understanding of the rest of the work. We should remark here that such a mathematical background was necessary for even the leading German physicists to understand the work, for the emphasis at this time was on a non-mathematical approach to physics. We should also remark that, despite Ohm's attempts in this introduction, he was not really successful in convincing the older German physicists that the mathematical approach was the right one. As stated above, this work included "Ohm's Law" theory: The relationship of a current passing through most materials is directly proportional to the potential difference applied across the material

Although Ohm's work strongly influenced theory, at first it was received with little enthusiasm. However, his work was eventually recognized by the Royal Society with its award of the Copley Medal in 1841. He became a foreign member of the Royal Society in 1842, and in 1845 he became a full member of the Bavarian Academy.



## TECHNICAL ARTICLE'S

## माइकेल फैराडे



माइकेल फैराडे, अंग्रेज भौतिक विज्ञानी एवं रसायनज्ञ थे। उन्होंने विद्युत-धारा के चुम्बकीय प्रभाव का आविष्कार किया। उसने विद्युतचुम्बकीय प्रेरण का अध्ययन करके उसको नियमबद्ध किया। इससे डायनेमो तथा विद्युत मोटर का निर्माण हुआ। बाद में मैक्सवेल **Maxwell** के विद्युतचुम्बकत्व के चार समीकरणों में फैराडे का यह नियम भी सम्मिलित हुआ। फैराडे ने विद्युत रसायन पर भी बहुत काम किया और इससे सम्बन्धित अपने दो नियम दिये।

माइकेल फैराडे का जन्म 22 सितंबर 1791 ई. को हुआ। इनके पिता बहुत गरीब थे और लुहारी का कार्य करते थे। इन्होंने अपना जीवन लंदन में जिल्दसाज की नौकरी से प्रारंभ किया। समय मिलने पर रसायन एवं विद्युत् भौतिकी पर पुस्तकें पढ़ते रहते थे। सन् 1813 ई. में प्रसिद्ध रसायनज्ञ, सर हंफ्री डेवी, के व्याख्यान सुनने का इन्हें सौभाग्य प्राप्त हुआ। इन व्याख्यानों पर फैराडे ने टिप्पणियाँ लिखीं और डेवी के पास भेजीं। सर हंफ्री डेवी इन टिप्पणियों से बड़े प्रभावित हुए और अपनी अनुसंधानशाला में इन्हें अपना सहयोगी बना लिया। फैराडे ने लगन के साथ कार्य किया और निरंतर प्रगति कर सन् 1833 में रॉयल इंस्टिट्यूट में रसायन के प्राध्यापक हो गए।

अपने जीवनकाल में फैराडे ने अनेक खोजें कीं। सन् 1831 में विद्युच्चुम्बकीय प्रेरण के सिद्धांत की महत्वपूर्ण खोज की। चुम्बकीय क्षेत्र में एक चालक को घुमाकर विद्युत्-वाहक-बल उत्पन्न किया। इस सिद्धांत पर भविष्य में जनित्र (**generator**) बना तथा आधुनिक विद्युत् इंजीनियरी की नींव पड़ी। इन्होंने विद्युद्विश्लेषण पर महत्वपूर्ण कार्य किए तथा विद्युद्विश्लेषण के नियमों की स्थापना की, जो फैराडे के नियम कहलाते हैं। विद्युद्विश्लेषण में जिन तकनीकी शब्दों का उपयोग किया जाता है, उनका नामकरण भी फैराडे ने ही किया। क्लोरीन गैस का द्रवीकरण करने में भी ये सफल हुए। परावैद्युतांक, प्राणिविद्युत्, चुम्बकीय क्षेत्र में रेखा ध्रुवित प्रकाश का घुमाव, आदि विषयों में भी फैराडे ने योगदान किया। आपने अनेक पुस्तकें लिखीं, जिनमें सबसे उपयोगी पुस्तक "विद्युत् में प्रायोगिक गवेषणाएँ" (**Experimental Researches in Electricity**) है।

फैराडे जीवन भर अपने कार्य में रत रहे। ये इतने नम्र थे कि इन्होंने कोई पदवी या उपाधि स्वीकार नहीं की। रायल सोसायटी के अध्यक्ष पद को भी अस्वीकृत कर दिया। धुन एवं लगन से कार्य कर, महान वैज्ञानिक सफलता प्राप्त करने का इससे अच्छा उदाहरण वैज्ञानिक इतिहास में न मिलेगा। हर फ्री डेवी भी फैराडे को अपनी सबसे बड़ी खोज मानते थे। माइकेल फैराडे की मृत्यु 25 अगस्त 1867 ई. को हुई।

## TECHNICAL ARTICLE'S

## Alessandro Volta



**Alessandro Volta**, in full **Conte Alessandro Giuseppe Antonio Anastasio Volta**, (born February 18, 1745, Como, Lombardy [Italy]—died March 5, 1827, Como), Italian physicist whose invention of the electric battery provided the first source of continuous current.

Volta became professor of physics at the Royal School of Como in 1774. In 1775 his interest in electricity led him to improve the electrophorus, a device used to generate static electricity. He discovered and isolated methane gas in 1776. Three years later he was appointed to the chair of physics at the University of Pavia.

In 1791 Volta's friend Luigi Galvani announced that the contact of two different metals with the muscle of a frog resulted in the generation of an electric current. Galvani interpreted that as a new form of electricity found in living tissue, which he called "animal electricity." Volta felt that the frog merely conducted a current that flowed between the two metals, which he called "metallic electricity." He began experimenting in 1792 with metals alone. (He would detect the weak flow of electricity between disks of different metals by placing them on his tongue.) Volta found that animal tissue was not needed to produce a current. That provoked much controversy between the animal-electricity adherents and the metallic-electricity advocates, but, with his announcement of the first electric battery in 1800, victory was assured for Volta. Known as the voltaic pile or the voltaic column, Volta's battery consisted of alternating disks of zinc and silver (or copper and pewter) separated by paper or cloth soaked either in salt water or sodium hydroxide.

A simple and reliable source of electric current that did not need to be recharged like the Leyden jar, his invention quickly led to a new wave of electrical experiments. Within six weeks of Volta's announcement, English scientists William Nicholson and Anthony Carlisle used a voltaic pile to decompose water into hydrogen and oxygen, thus discovering electrolysis (how an electric current leads to a chemical reaction) and creating the field of electrochemistry.

*Nikita H. Somaiyya (25122)- EE Second Year*



## TECHNICAL ARTICLE'S

## Joseph Henry



**Joseph Henry**, (born December 17, 1797, Albany, New York, U.S.—died May 13, 1878, Washington, D.C.), one of the first great American scientists after Benjamin Franklin. He aided and discovered several important principles of electricity, including self-induction, a phenomenon of primary importance in electronic circuitry.

Henry also searched for electromagnetic induction—the process of converting magnetism into electricity and in 1831 he started building a large electromagnet for that purpose. Because the room at the Albany Academy in which he wanted to build his experiment was not available, he had to postpone his work until June 1832, when he learned that British physicist Michael Faraday had already discovered induction the previous year. However, when he resumed his experiments, he was the first to notice the principle of self-induction.

In 1831 Henry built and successfully operated, over a distance of 2.4 km (1.5 miles), a telegraph of his own design. He became professor of natural philosophy at the College of New Jersey (later Princeton University) in 1832. Continuing his researches, he discovered the laws upon which the transformer is based. He also found that currents could be induced at a distance and in one case magnetized a needle by using a lightning flash 13 km (8 miles) away. That experiment was apparently the first use of radio waves across a distance. He aided Samuel F.B. Morse in the development of the telegraph by giving him 8 km (5 miles) of copper wire and writing a letter to Congress in 1842 encouraging it to support an 80-km (50-mile) test line. By using a thermo galvanometer, a heat-detection device, he showed that sunspots radiate less heat than the general solar surface.

In 1846 Henry became the first secretary of the Smithsonian Institution, Washington, D.C., where he organized and supported a corps of volunteer weather observers. The success of the Smithsonian meteorological work led to the creation of the U.S. Weather Bureau (later Service). One of Lincoln's chief technical advisers during the U.S. Civil War, he was a primary organizer of the National Academy of Sciences and its second president. In 1893 his name was given to the standard electrical unit of inductive resistance, the henry.

## TECHNICAL ARTICLE'S

## Andre-Marie Ampere



André-Marie Ampère (1775-1836), a French physicist, founded the science of electrodynamics now known as electromagnetism.

Danish physicist Hans Christian Orsted discovered, accidentally, in 1820 that a magnetic needle is deflected when the current in a nearby wire varies - a phenomenon establishing a relationship between electricity and magnetism. During September and October 1820, Ampère, influenced by Orsted's discovery, performed a series of experiments designed to elucidate the exact nature of the relationship between electric current-flow and magnetism, as well as the relationships governing the behavior of electric currents in various types of conductors. Among others, Ampère showed that two parallel wires carrying electric currents magnetically attract each other if the currents are in the same direction and repel if the currents are in opposite directions.

This experiments led Ampère to formulate his famous law of electromagnetism, called after him Ampère's law, that describes mathematically the magnetic force between two electrical currents.

His investigations, reported weekly before the Académie des Sciences, established the new science of electrodynamics.

He was also first person to develop measuring techniques for electricity in order to perform his experiments. Ampère built an instrument utilizing a free moving magnetized needle (a compass) to measure the flow of electricity. The later refinement of this instrument is known as galvanometer. Basically, a simple modern galvanometer is an instrument where a free pivoting coil and an attached needle are placed in the magnetic field of a permanent magnet. When an electric current is passed through the coil it experiences a torque due to the interaction of the current with the magnetic field. As a result the coil pivots and the needle is deflected proportionally to the current passing through the coil.

The unit of electric current is ampere, is called after Andre-Marie Ampere.



**FACULTY MAGAZINE COMMITTEE**



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**Electrical Engineering**



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**(Lecturer)**  
**Electrical Engineering**

**Ω THANK YOU Ω**