MACET MYSTICA

MAULANA AZAD COLLEGE OF ENGINEERING & TECHNOLOGY

EDITORIAL

Learning Engineering is the activity of application of evidence based principles and methods to implement the life cycle approach. There is a move to outcome based education in recent years. Outcome based education is a process that involves assessment and reporting practices to achieve high order learning and mastery. It is focused on achieving certain specified outcomes in terms of student learning. In this system of education future objectives/outcomes for students are set then assessed and evaluated and on the basis of evaluation results there is a continuous improvement process.

You really have to be technology savvy, you need to have digital experiences which really is an absolute requirement. You certainly get yourself skilled, it's really important to keep pace with the changing world.

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CONTENTS

EMERGING TRENDS:

➢ Smart Grid Technology

FACULTY CORNER:

➢ Indian Tax System

➢ FDPs / Research Papers

STUDENT'S CORNER:

➢ Qbot Malware

➢ 3D Printing

Smart Grid Technology

Mohammed Waris Senan, Department of EEE

The world is moving towards a more sustainable and efficient energy system, and one of the key technologies that is leading the way is smart grid technology. Smart grids are modern power grids that utilize digital communication and advanced technologies to optimize the generation, transmission, and distribution of electricity. In this article, we will explore what smart grid technologies are, how they work, and what benefits they offer.

❖ What are Smart Grid Technologies?

Smart grid technologies are a collection of hardware, software, and communication technologies that make up the modern power grid. They utilize sensors, data analytics, and advanced control systems to provide greater flexibility, reliability, and efficiency in the way we generate, transmit, and distribute electricity.

Some of the key components of a smart grid include:

➢ Advanced Metering Infrastructure (AMI) - This technology allows utilities to collect data on energy consumption in real-time, enabling better load balancing and more accurate billing.

➢ Distribution Automation - This technology enables utilities to remotely monitor and control the flow of electricity through the distribution grid, improving reliability and reducing outages.

➢ Energy Storage - This technology allows for the storage of excess electricity generated during periods of low demand, which can be used during periods of high demand to reduce the need for fossil fuel-based peaker plants.

➢ Renewable Energy Integration - Smart grids can integrate renewable energy sources such as solar and wind power, allowing for more efficient and sustainable power generation.

➢ Demand Response - This technology enables utilities to incentivize customers to reduce their energy consumption during periods of high demand, reducing strain on the grid and helping to avoid blackouts.

❖ How Do Smart Grid Technologies Work?

Smart grids work by utilizing a network of sensors and communication technologies to gather data on energy consumption and production in real-time. This data is then analyzed by advanced software and control systems, which can make adjustments to the power grid to optimize performance and efficiency.

For example, if there is excess solar power being generated during the day, the smart grid can automatically store this energy in batteries for use during periods of high demand. Similarly, if there is a sudden increase in energy consumption, the smart grid can automatically adjust the flow of electricity to prevent overloading and avoid blackouts.

SMART GRID

Wind Energy

Solar Energy

Nuclear Power Plant

Thermal Power Plant
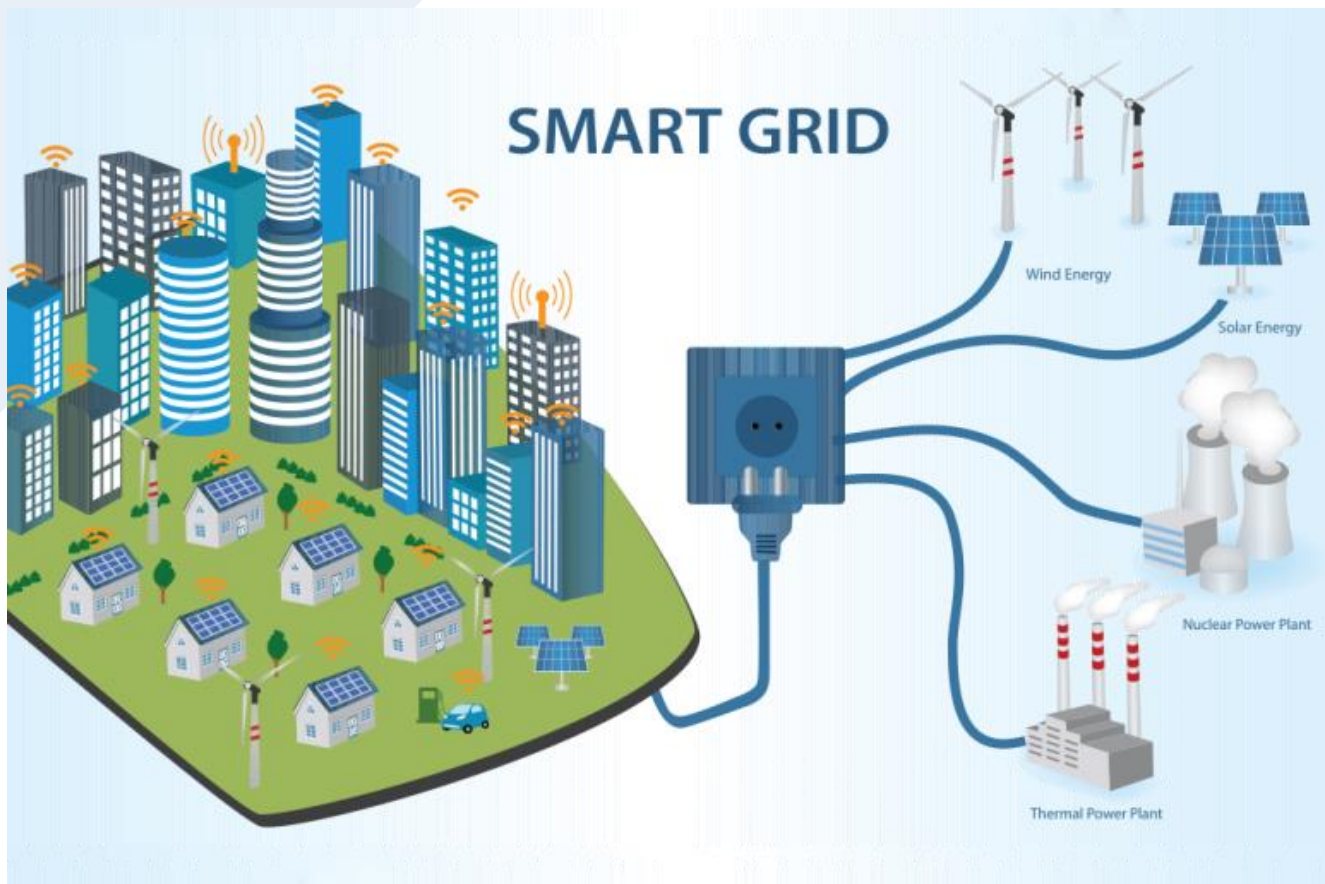
❖ **What Benefits Do Smart Grid Technologies Offer?**

Smart grid technologies offer a wide range of benefits to utilities, consumers, and the environment. Some of the key benefits include:

1. Improved Reliability - Smart grids enable utilities to quickly identify and respond to power outages, reducing downtime and improving the reliability of the power grid.
2. Increased Efficiency - Smart grids can optimize the flow of electricity, reducing waste and improving the efficiency of the power grid.
3. Cost Savings - By reducing the need for fossil fuel-based peaker plants and improving the efficiency of the power grid, smart grid technologies can help to lower energy costs for consumers.
4. Increased Sustainability - By integrating renewable energy sources and reducing waste, smart grids can help to reduce greenhouse gas emissions and promote a more sustainable energy system.

Conclusion:

Smart grid technologies are transforming the way we generate, transmit, and distribute electricity. By utilizing advanced hardware, software, and communication technologies, smart grids offer improved reliability, increased efficiency, cost savings, and increased sustainability. As we continue to move towards a more sustainable and efficient energy system, smart grids will play a critical role in achieving our goals.

Indian Tax System & Taxation in India

Md. Shabbeer Ansari, Department of Mechanical Engineering

Taxes are an important and largest source of income for the government. The government uses the money collected from taxes for various projects for the development of the nation. The Indian tax system is well structured and has a three-tier federal structure.

The tax structure consists of the central government, state governments, and local municipal bodies. When it comes to taxes, there are two types of taxes in India – Direct and Indirect tax. The direct tax includes income tax, gift tax, capital gain tax, etc while indirect tax includes value-added tax, service tax, goods and services tax, customs duty, etc.

The Central Government of India imposes taxes such as customs duty, central excise duty, income tax, and service tax. The state governments impose income tax on agricultural income, state excise duty, professional tax, land revenue and stamp duty. The local bodies are allowed to collect octroi, property tax, and other taxes on various services like water and drainage supply.

Types of Taxes in India

Taxation in India is majorly divided into Central and State Govt. taxes with two types of taxes:

❖ Direct Taxes

❖ Indirect Taxes

While direct taxes are levied on your earnings in India, indirect taxes are levied on expenses. The responsibility to deposit the direct tax liability lies with the earning party, whether individual, HUF or a company.

Indirect taxes are collected majorly by the corporates and businesses providing services and products. Thus, the responsibility to deposit indirect taxes lies with these entities.

What is Direct Tax?

Direct taxes are imposed on corporate entities and individuals. These taxes cannot be transferred to others. For individual taxpayers like you, the most important type of Direct tax is the income tax. This tax is levied during each assessment year (1st April to 31st March). As per the Income Tax Act, 1961, it is mandatory for you to make income tax payments if your annual income is above the minimum exemption limit. You can get tax benefits under various sections of the Act.

What are the Different Types of Direct Tax?

Direct taxes account for almost 50% of the government's revenue in India. However, income tax is not the only direct tax. Here are the types of direct taxes applicable in India:

1. Income Tax
2. Capital Gains Tax
3. Corporate Tax

Income tax applies to any income of an Individual and HUF except capital gains and profits from business and profession. Income tax is calculated as per the applicable slab rates for the Assessment Year.

The central government announces the slab rates in the annual budget.

You also have the provision to reduce your taxable income using the tax-saving investments and expenses under section 80C.

What are the Different Types of Indirect Taxes in India?

Indirect taxes in India have been the most consistent and largest revenue source for the government. The Indian tax system has had multiple indirect taxes, some of these are still operational:

Service Tax   Indian Excise Duty

Value Added Tax (VAT)   Customs Duty

Securities Transaction Tax (STT)   Stamp Duty

Entertainment Tax

Few of the indirect taxes in India like service tax, value-added tax and excise duty have been removed for a large number of goods and services. These taxes have been replaced by a single Goods and Services Tax.

Customs duty tax applies to the goods being imported into India from other countries, and in a few cases on the goods being exported from India.

Securities Transaction Tax or STT applies to the transactions involving an exchange of financial securities. For example, equity stocks, mutual fund units, future and options contracts. This tax is necessarily applied to securities exchange transactions. However, you can also pay Stamp duty and STT on securities changing hands outside the exchange or over the counter.

STT allows the buyers and sellers of securities to benefit from lower short and long-term capital gains taxes on the exchange.

Stamp duty is a State Government levy on the transfer of assets within their territory. It acts as legal proof of ownership of the asset or security.

Entertainment tax in India is also a state subject and applies to the transactions involving the entertainment business in the country. Such businesses and activities will include movie releases, sporting events, concerts, amusement parks, theatres, etc.

What is Goods and Services Tax?

Goods and Services Tax or GST has been a consolidation of a complex web of indirect taxes in India. Taxation in India can have three layers of levies – Centre, State and Local Authority or Municipalities.

Before GST introduction in the Indian taxation system, the following indirect taxes could apply to the goods and services in India:

Excise Duty   Entertainment Tax

Value Added Tax (VAT, State)   OService Tax

Central Sales Tax(collected by State)   Service Tax

Purchase Tax   Entry Tax (State)

Luxury Tax (State)

These interconnecting and often overlapping taxes posed many disadvantages and conflicts for suppliers and manufacturers along with the government bodies.

FDPs / Research Papers

Mechanical Department

Conferences/Books/Chapters/Publications

Authors: Dr. Naushad Hasin Khan, Dr. Syed Shahbaz Anjum, Dr. Md Reyaz, Firoz Alam

Paper Presentaion: Dr. Naushad Hasin Khan

- *"Modelling Yield Stress Nanofluids Using the Regularized Bingham Model for Hydrothermal Transport Analysis",* 2nd International Conference on Advanced Intelligence & Innovations in Mechanical Sciences (AIIMS 2.0), SRM Institute of Science & Technology, Chennai, 20-21 April, 2023.

Awards

Dr. Naushad Hasin Khan

- Best paper presentation Award in 2nd International Conference on Advanced Intelligence & Innovations in Mechanical Sciences (AIIMS 2.0).

Mr. Firoz Akhtar

Attended **NPTEL Course** on "*Principles of Casting Technology*" from Jan-March 2023 (8 week course)

Attended **One week online FDP** Course on "*Power Generation from Energy Resources*" from 24 to 28 April, 2023 from NITTTR KOLKATA has been completed by:

- Dr. Syed Shahbaz Anjum
- Dr. Md Reyaz
- Mr. Aon Ahmad
- Mr. Syed Moazzam Hussain
- Mr. Md Shabbeer Ansari
- Mr. Ali Nezam
- Mr. Quaiser Suhail
- Ms. Saima Farzeen
- Dr. Naushad Hasin Khan
- Mr. Kashif Faridi
- Mr. Firoz Alam
- Mr. Md Irshad Alam Ansari
- Mr. Md Mojahid

ECE Department

Mr. Md. Nadeem Enam

- Attended **FDP** on "*Introduction to Machine Learning & Deep Learning*" organized by NITTTR, Kolkata held from 27th March to 31st March 2023.

- Attended **Event** on "*International Day of Immunology (DoI-2023)*" Theme "Immunology Talks for Public Health "organized by MANUU, Hyderabad held on 27th April 2023.

- Certificate of Participation in "*Antennas for IOT*" organized by IEEE Joint Chapter of AP, MTT & EMC Society (JCAME) Pune.

- Certificate of Participation in "*Assessment, Evaluation and Preparing Questions Papers*" organized by NITTTR, Kolkata from 22th May to 26th May2023.

- Certificate of Participation in "*Hadoop Ecosystem in Big data Technology*" organized CDAC, Noida on 29th May 2023.

FDPs / Research Papers

Mrs. Meena Prasad

Successfully completed **NPTEL Online Certification course** on "Cloud Computing and Distributed Systems and was adjudged **TOPPER** in the course with a consolidated score of 87 % .

Mr. Md. Naushad Akhter

- Successfully completed **NPTEL Online Certification course** on " *Cloud Computing and Distributed Systems*" with a consolidated score of 60 %
- Successfully completed **NPTEL Online Certification course** on "*Introduction to Internet of Things* " with a consolidated score of 73% .

Mr. Shahid Aziz

- **Participated** in a "One-Week Online International **Workshop** on "*Technical Writing using LaTeX*" organized by the School of Electronics Engineering (SENSE) at VIT-AP University held from 30th March - 5th April 2023.

Dr. Tajuddin Ali Ahmad

- Successfully completed **NPTEL Online Certification course** on "*Introduction to Internet of Things*" with a consolidated score of 76 % .

Mr. Ozair Ahmad

- Successfully completed **NPTEL Online Certification course** on "*Deep Learning*" and was adjudged **topper in the course** with a consolidated score of **75 %** .
- **Attended** an online **FDP** on "*Block Chain*" organized by E & ICT Academy, IIT Kanpur between 20th March to 24th March 2023.

PUBLICATION IN REFEREED INTERNATIONAL SCIE JOURNAL

Shahid Aziz, S. Shahnawazuddin, "*Effective preservation of higher-frequency contents in the context of short utterance based children's speaker verification system*", Applied Acoustics, ELSEVIER, Volume 209, 2023, ISSN 0003-682X.

https://doi.org/10.1016/j.apacoust.2023.109420.

EEE Department

Attended **FDP** on "*Induction Training*" organized by NITTTR Kolkata from 27th March to 31th March, 2023 by the following:

- **Mr. Md. Inayat Ali**
- **Mrs. Aaisha Tasneem**
- **Mr. Md. Raza**

CSE Department

Mr. Amit Kumar

- Attended **FDP** on "*Introduction to Machine Learning & Deep Learning*" organized by NITTTR, Kolkata held from 27th March to 31st March 2023.

Attended **3rd One-week International Workshop** on "*Python Programming*" organized by EICT Academy and IIT Kanpur, from 13th Mar. To 17th Mar., 2023 by the following:

- **Dr. Shabbir Hasan**
- **Mr. Mazhar Eqbal**
- **Mr. Rakesh Ranjan**
- **Mr. Hasibul Hasan Mansoori**
- **Dr. Md. Sadruddin Ahmad**

Mr. Rakesh Ranjan

- Attended **FDP** on "*Technical Writing using LaTex (Online)*" organized by the School of Electronics Engineering (SENSE) at VIT-AP University, Amaravati, India from 30th March to 5th April 2023.

Mr. Hasibul Hasan Mansoori

- Attended **FDP** on "*AI for Multimedia Processing & Security*" organized by NIT Patna, 18th Feb. to 22nd Feb. 2023.
- Attended **Faculty Diploma Program** in "*Cloud Computing & DevOps Engineering*" organized by PHN, Pune Technology Pvt. Ltd. from 25th Feb. to 08th Apr. 2023.
- Attended **Online Quiz** on "*Secure Social Media Practices*" organized as a part of "Stay Safe Online (SSO) Campaign" by CDAC Hyderabad, from 20th Mar. to 30th Apr. 2023.

Attended **FDP** on "*Machine Learning*" organized by E&ICT Academy and IIT Kanpur, from 27th Mar. To 02nd Apr., 2023 by the following:

- Mr. Rakesh Ranjan
- Mr. Hasibul Hasan Mansoori

Attended **FDP** on "*Block Chain*" organized by E&ICT Academy and IIT Kanpur, from 20th Mar. To 24th Mar., 2023 by the following:

- Mr. Rakesh Ranjan
- Mr. Mazhar Eqbal
- Mr. Hasibul Hasan Mansoori
- Dr. Md. Sadruddin Ahmad

Mr. Zaffar Abbas

Attended **5 Days Online International Faculty Development Program** on "*Data Science and Chat GPT*" organized by **K L Deemed to be University** in Collaboration with **ExcelR** from 15th May 2023 to 19th May 2023

Book Published

Mr. Aamir Junaid Ahmad Book **"Revolutionizing Social Networks with Semantic Web Tools"** Published in the USA and is available on Amazon and Flipkart
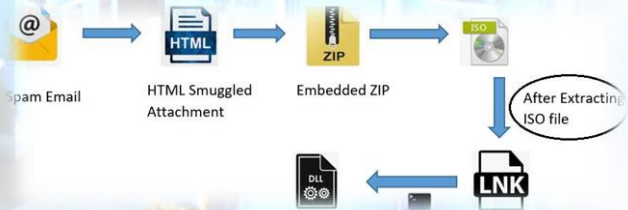
Qbot Malware

Sana Azad, CSE Branch , 2022 Batch

Qbot is a Banking Trojan (virus) that was first observed in 2007. Today, Qbot is still a dangerous and persistent threat to organizations and has become one of the leading banking Trojans globally.

To this day, Qbot continues to grow and develop, with more capabilities and new techniques. It's main purpose is to steal banking data(banking credentials, online banking session information, victim's personal details, etc.). This banking virus is 'December' 2022's most wanted malware (often distributed via spam email, Qbot employs several anti-VM, anti-debugging techniques to hinder analysis and evade detection). It can be spread through phishing spam emails containing malicious attachments or links. A new Qbot malware compaign dubbed QakNote has been observed in the wild since the month i.e. in Jan 2023, using malicious Microsoft OneNote. The overwhelming theme from the last research is how malware often masquerades as legitimate software to give hackers backdoor access to devices without raising suspicion. That is why it is important to do your diligence when downloading any software and applications or clicking on links, regardless of how genuine they look. The Qbot infection chain is not very sophisticated. In the past, spam emails that delivered Qbot used malicious documents with macros, but now they contain URLs to a .zip file that has a downloader script inside written in VBScript (VBS). These type of scripts used to execute natively on windows in the context of Internet Explorer as it's a scripting language developed by Microsoft. The VBS downloader used by Qbot has routines that detect virtual machines and analysis sandboxes and pulls an .exe payload from six hardcoded URLs. If the payload executes successfully, it deploys the Qbot malware on the computer.

To avoid getting infected by QBot malware following are the ways-

- Keep your Operating system updated and avoid using Windows OS versions that have stopped getting support from Microsoft such as Windows XP.
- Always keep your Operating System up-to-date, and regularly update your third-party software.
- Disable Java from your system if you do not use it quite often.
- Never click on any URL in a suspicious email received in your inbox.
- Do not download or open any suspected attachments from email or from anywhere on the web.

Student's Corner

3D Printing Technology

Zufeshan Naaz, EEE, 2019 Batch

While the technology has been around for 25 years or so, it was used primarily by engineers to create prototypes. More recently 3D painting technology has become available to more people at a lower cost to create objects on demand locally.

We all know what printing is so let's begin with 3D printing .3D is shorthand for 3 dimensional when we print a page on a printer there are only 2 dimensions the front of the page and the back of the Page. 3 dimensional printing adds a 3rd dimension, volume. 3D printing uses a printer to create 3 dimensional objects for example a cup or yoda doll or phone case.

3D printing has these qualities: Objects are created by adding or depositing layers of materials not subtracting or cutting out paper pieces from a block of material.

Because objects are created by adding layers the computer file with details about your model must be converted into slices the printer will create layer by layer. Printing a 3 dimensional object can take hours or days to complete depending on the complexity and size of the object. Cost is based on materials used among other factors in contrast if you buy a piece of wood then cut out pieces to create your object you pay for the original piece.

How 3D printing is used:

Today 3d printing is mostly done by business students and designers. Home or consumer use of 3D printing is mostly limited to people trying out the technology. However there is a lot of value in printing 3 dimensional objects for students' designers and anyone who need a small object to demonstrate their ideas or create usable objects. Students as young as 10 years old also might use a 3D printer in shop class .

It's the future use of this technology we have people excited. For example replacing the plastic bag of our TV remote might involve going to a website filing the part clicking a button to have the power printed locally where we can pick it up. Today we either replace the complete remote control or figure out where to get the replacement part which has been created elsewhere likely overseas.

More interesting 3D printing makes it possible to experiment with fashion and other parts of our lives we take for granted. It might be possible to create medical implants, for example using tissue from the patient.

It is also possible 3D printing will be used as part of a larger manufacturing process for example to create cars in addition to a new set of cars offer every year by automakers.

How 3D printing works

At a high level a 3D printer text material usually plastic wrapped on a spool, heats the material and then fuses the material layer by layer to build a 3 dimensional object. The material is excluded or pushed out and deposited. Precision is critical for 3D printers the print head pulleys are extruder hardware must be aligned as well as software dimensional translated to the correct real world dimensions used by printer hardware The printrbot printer is a low end enter we can build ourselves to understand how all the pieces of a 3D printer together and work most people have ever use a pre-built printer where they adjust the location of the printer head and build platform as well as test the screwdriver head inside the material used to print. There are at least 2 kinds of additive 3D printing resin and non Resin.

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