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Principal's Message



Technical Education is the most potential instrument for socio-economic change. Presently, the engineer is seen as a high-tech player in the global market. Distinct separation is visible in our education between concepts and applications. Most areas of technology now change so rapidly that there is a need for professional institutes to update the knowledge and competence.

Institute of Engineering and Science, IPS Academy is a leading, premium institution devoted to imparting quality engineering education since 1999. The sustained growth with constant academic brilliance achieved by IES is due to a greater commitment from management, dynamic leadership of the president, academically distinctive and experienced faculty, disciplined students and service oriented supporting staff.

The Institute is playing a key role in creating an ambiance for the creation of novel ideas, knowledge, and graduates who will be the leaders of tomorrow. The Institute is convinced that in order to achieve this objective, we will need to pursue a strategy that fosters creativity, supports interdisciplinary research and education. This will also provide the students with an understanding and appreciation not only of the process of knowledge creation, but also of the process by which technology and knowledge may be used to create wealth as well as achieve social economic goals.

I am delighted to note that the engineering graduates of this institute have been able to demonstrate their capable identities in different spheres of life and occupied prestigious positions within the country and abroad. The excellence of any institute is a measure of achievements made by the students and faculty.

Dr. Archana Keerti Chowdhary
Principal

HOD's Message



Education, particularly Technical Education is playing a vital role in the development of the country by creating skilled manpower, enhancing industrial productivity and improving the quality of life. People talk about wonders of the world and include structures and monuments but Communication Engineering is the greatest wonder of the world that even no one imagined. To continuously spread the quality technical education we the Dept of Electronics and Communication Engineering are committed to take up responsibility of the holistic growth of the pupil coming in to its folds, is committed to make all possible efforts to help in realizing their dreams as well as the society to which he or she hails from.

Prof. Rupesh Dubey
Professor & Head, Dept. of ECE

SESSION 2016-17

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To the Readers

In continuing our endeavor to inform, educate as well as provide an opportunity to deserving people, this edition of Magazine “Electronica” is the premier chronicler of computing technologies, covering the latest discoveries, innovations and research that inspire and influence the field. Every year, we bring readers in-depth stories of emerging areas of Electronics and Communication Engineering, new trends in IT and practical research applications. Faculty and students choose this to debate technology implications, public policies, engineering challenges and market trends.

Besides that it doesn't forget it's primary objective that is to promote Electronics and Communication Engineering from it's grass root levels. We hope that this edition would be enjoyable as well as informative.

Editors.....

PROGRAM EDUCATIONAL OBJECTIVES (PEO's)

PEO 1: Preparation: To prepare students to excel in undergraduate programs and to succeed in industry / technical profession through global, rigorous education.

PEO 2: Core Competence: To provide students with a solid foundation in mathematical, scientific and engineering fundamentals required to solve engineering problems and also to pursue higher studies.

PEO 3: Breadth: To train students with good scientific and engineering breadth so as to comprehend, analyze, design, and create novel products and solutions for the real life problems.

PEO 4: Professionalism: To inculcate in students professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate engineering issues to broader social context, additional courses with regard to physical, psychological and career growth.

PEO 5: Learning Environment: To provide student with an academic environment aware of excellence, outstanding leadership, written ethical codes and guidelines with moral values, and the life-long learning needed for a successful professional career.

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

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

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

DEPARTMENT INFORMATION

Name and Address of Department

Department of Electronics and Communication Engineering
IPS Academy , Institute of Engineering & Science,
Knowledge Village
Rajendra Nagar, A. B. Road, Indore (M. P.) PIN – 452012

Head of Department

Prof. Rupesh Dubey
HOD, Electronics and Communication Engineering
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History of Department

Institute of Engineering & Science (IES) was established in the year 1999, with Electronics and Communication Engineering branch having an intake of 60 students. In the year 2004, BE (EC) intake was increased from 60 to 90 and further to 120 students in the year 2005 via approval from AICTE, New Delhi. The Department got the approval for starting ME degree course (Specialization- ECE) in the year 2007. In the year 2017, Department got accredited from National Board of Accreditation.

VISION AND MISSION OF DEPARTMENT

Vision

The vision of Department of Electronics and Communication Engineering is to provide higher education in the field of technology and reach status of a Nationally and Internationally reputed Institution which is based upon the culture and the values of universal science and contemporary education and a center of research which lay the groundwork in shaping the future in the field of Engineering.

Mission

To create world class facilities and environment for human resource development capable of contributing towards research and innovations in the field of Electronics and Communication Engineering with emphasis on development of Society.

DEPARTMENT FACULTY DETAILS

 <p>Dr. M.G. Sharma Advisor</p>	 <p>Prof. R C Dubey Prof.</p>	 <p>Prof. Rupesh Dubey (Asso. Prof.)</p>	 <p>Mr. Amiteshwar Bhalavi (Asso. Prof.)</p>
 <p>Ms. Angita Hirwe (Asso. Prof.)</p>	 <p>Dr. Dharmendra S. Yadav (Asso. Prof.)</p>	 <p>Ms. Kavita Upadhyay (Asso. Prof.)</p>	 <p>Mr. Nitin Jain (Asso. Prof.)</p>
 <p>Ms. Smita Patil (Asso. Prof.)</p>	 <p>Mr. Amit Pathak (Asst. Prof.)</p>	 <p>Mr. Ashish Sharma (Asst. Prof.)</p>	 <p>Mr. Deepak Bicholia (Asst. Prof.)</p>

 <p>Mr. Dharmendra Yadav (Asst. Prof.)</p>	 <p>Mr. Gaurav Matange (Asst. Prof.)</p>	 <p>Mr. Gopal Gupta (Asst. Prof.)</p>	 <p>Mr. Harsh Gaud (Asst. Prof.)</p>
 <p>Mr. Indra Kumar Shah (Asst. Prof.)</p>	 <p>Mr. Nilesh Sharma (Asst. Prof.)</p>	 <p>Ms. Namrata Atre (Asst. Prof.)</p>	 <p>Ms. Poonam Lilhare (Asst. Prof.)</p>
 <p>Mr. Rahul Pal (Asst. Prof.)</p>	 <p>Mr. Rajesh B. Ahirwar (Asst. Prof.)</p>	 <p>Mr. Ritesh Gupta (Asst. Prof.)</p>	 <p>Mr. Roopesh Makwana (Asst. Prof.)</p>
 <p>Mr. Sunil Chavda (Asst. Prof.)</p>	 <p>Mr. Sharad Jain (Asst. Prof.)</p>	 <p>Ms. Shobha Shakya (Asst. Prof.)</p>	 <p>Ms. Vandana Dubey (Asst. Prof.)</p>

DEPARTMENT MEMBERSHIP

Department of Electronics and Communication Engineering has membership of Institution of Electronics and Telecommunication Engineering (IETE) student forum & IEEE Student chapter. Many Events and Expert Lecture are organized under the banner of IETE & IEEE Student chapter in 2016-17.

SPORTS ACTIVITIES

Students had received winner and runner up awards in different sports activities such as Cricket (Female), Volley Ball (Female), Table Tennis (Female), Badminton (Female), Basket Ball (Female), Volley Ball (Male) at institute level.

ESSAY

Cloud Computing and it's use in Education.

1. Introduction

To understand the meaning of Cloud Computing, it is necessary to understand the origin of such name. It derives from an old practice of representing the Internet as a “small cloud”, in an attempt to depict with this metaphor what the Internet actually is – a gargantuan net formed by hundreds, thousands of sub-networks, some available for the general public, others restricted to private use, all interconnected.

There are different types of services available to Internet users on these sub-networks. Services that can be totally or partially paid for, such as those of Newspapers and Magazines; free services, which intend to become charged, such as LinkedIn; services that bear a cost, but are sponsored, so there is no expense to the user, such as Yahoo; services that are totally free, which certainly intend to bear a price in the future; Private Services, such as Banks and Airway Services, which exist to assist their clients; Public services, offered by government bodies or institutions to provide citizens with information and services, such as City Administrations, State or Federal Government Secretariats; and, of course, learning computational environments made available by the teaching institutions.

In this chapter, we will use as example, a hypothetical major educational institution, with units across the country.

This educational institution has to be concerned over its administrative, academic and pedagogic support systems. We are aware that the use of Information and Communication Technologies (ICT) and its results on teaching and learning have been studied for a long time by Education

researchers. They have observed huge government and private investments in schools to equip them to use information technology; the various forms of use of these Technologies pro education have already been classified, and it has been highlighted the importance of computational learning environments, where simulations and animations need to be integrated, and where the interaction occurs mediated by the computer. Invariably, researchers recommend deeper studies, which might bring about more conclusive results, necessarily implying broader scale research, as the currently available technological frameworks only allow limited experiments. Focusing on educational environments available at teaching institutions, we verified that they are all offered by the institutions themselves through their data-centers – groups of application and databank servers, such as the institutions that are Moodle or TeleEduc users. The greater the success of this computational learning environment, the bigger will the data-center have to be and the better will the communication have to be, between the data-center and the Internet. This great framework demands a powerful computing infrastructure in order to be functional, along with its inherent costs.

2. The Cloud Computing

The Cloud Computing technology allows services provided by a site to be transferred to the “Internet cloud”, that is, it allows applications and databases of a data-center to be transferred to an Internet sub-network. This activity is facilitated by companies specialized in handling data-center services, transferring data to their own data-centers, strategically positioned on the Internet - large organizations [5] such as IBM, SUN, Microsoft, Accenture, EDS, Google, etc; which study the best location for specific installations, manage performance through demand analysis and take on responsibility

for the data integrity. Ultimately, all the physical structure (hardware) as well as the logical structure (systems and data) can be replaced through a “Cloud computing” transfer.

Although the Cloud Computing is not free of charges, it offers 4 (four) great advantages for a teaching institution: it does not consume resources from the local data-center; its cost is based on demand (pay per use); it provides Interoperability, as it allows the usage of technologies from various sources, such as Windows and Linux applications; and it does not require software installation on users’ equipment (in our case, students, Professors and Researchers).

It is not an experimental technology, as it was launched in 2008 [5] and it is currently utilized by practically all known social networks. We can easily identify services that are already on Cloud Computing, just by asking: Can we use them directly from our web browser? Without any new installation? Can we access these services from any computer, even from someone else’s? MSN Messenger, Facebook, Linkedin and Live@Edu are classical examples of Cloud applications.

Cloud Computing has the potential to solve three big concerns. First, it reduces initial investments of a teaching institution, which would have no need to assemble, maintain or expand its physical infrastructure to hold its computational learning environments; second, costs become variable because charges are on demand, that is, many users at a certain moment, make costs go up, few users at another moment, lower the costs; and third, it sorts out the technical issue of site location, since this problem is transferred to the company that operates the Cloud services, which is interested in maintaining excellence in services.

3. The impact of Cloud Computing on Educational Institutions

Regarding the evolution of Information Technology, Cloud Computing is as revolutionary as, or even more than, the earlier big technological leaps, such as “time-sharing”, which in the 1970’s, allowed large computers to perform various jobs at the same time, increasing their processing power dramatically; and, later, in the 80’s/90’s, client-server computing, which enabled “job sharing” between computers of different sizes, such as personal computers, which assisted users through their user-friendly interface, exchanging information with larger machines, with more processing capacity and speed – where bulk volumes of data were processed and stored. By the advent of local, regional networks, and then, the Internet, the client-server computing became the basis of all the accelerated development of the use of Information Technology in wide scale, such as we have today. It has evolved from a business support framework to become an inherent part of it. Today, we cannot devise companies or institutions such as banks, telecommunications operators or large educational institutions, deprived of Information Technology.

The main advantages of a migration to Cloud Computing are linked to development, cost cutting and performance:

- Interoperability – capacity to develop with different software platforms;
- High computing capacity – HPC capacity (high processing computing);
- Data in Cloud – security and enormous storage capacity in servers;
- Cost cutting, by pay per use (not by licenses);
- Fast system implementation, quick to adapt or change systems;
- Possibility of cutting fixed costs, enabling their change into variable costs.

In addition to these advantages, there are two other very important ones, though

obvious, given that they derive from general concept. They are usually overlooked as far as Cloud Computing is concerned: one is the freedom and flexibility that teaching institutions have gained in being disconnected from the physical world of their data-centers and entering a virtual/logical world, where everything is possible with various options of implementation of Cloud Computing strategy; and the other is the interoperability, which is the capability of integration of different platform systems (Windows and Linux; Linux and Windows), which seems to be an intrinsic quality of Cloud Services Platforms.

The differentiated access control required between students and Professors can be implemented easily on a Software framework as a Service, which does not depend on client-applications, and, mainly, it can be implemented, managed, reconfigured, and modified, without difficulty, in a centralized manner, to thousands of students in the entire country. Most importantly, it will not consume hardware and software resources of the teaching institution - a current significant barrier to these educational centers, as they usually experience a serious disproportion between the number of students and the number of Professors.

Another issue to be considered is that in average usage situations, thousands of Internet users operate accessing hundreds of different sites, distributing statistically the traffic on the net and the load on servers, which are hosting the services. An Educational activity, using a virtual environment, which hosts an e-learning system, entails a different behavior – hundreds of users accessing the same site, at the same time, causing a “ traffic jam“ problem. This problem may be resolved through Cloud Computing, given that the

traffic management becomes a responsibility of the company in charge of the Cloud processing.

4. Classification of Cloud Computing Environments

The Cloud Computing environments may be classified in terms of access and location as Public, Private or Hybrid:

□ General Public Cloud: available to anyone on the Internet; that is, any user may access and use a public Cloud. Its benefits are as follows:

- o Easy and low cost infrastructure management - since its hardware and software can be managed by the service provider;

- o Scalability and Elasticity – processing and storing resources are used on demand,

- o Eliminates complex cycles of search for resources – increasing speed of delivery application, once resources are always available, when necessary;

- o Relieves the IT team of the user company – from concerns about infrastructure to pursue the development of business applications.

- o OBS: examples of Public Clouds: Amazon Elastic Computer Cloud, Google App Engine and

Microsoft Windows Azure.

□ Private Clouds: Cloud environments which can only be accessed by a limited number of users. They are Clouds normally installed within the limits of a data-center, behind a firewall. Their benefits are as follows:

- o Exclusive use – greatest control on data, security and quality of services;

- o Ownership – total control of the infrastructure and of how applications are executed;

- o Management by the IT team of the user organization – which implies high level of control.

o OBS: in this case, most advantages of the Cloud Computing application are restricted to savings on hardware and management of physical infrastructure, because though costs are reduced they still remain at high levels.

□ Hybrid Clouds: also known as “virtual private clouds”, they offer services that are performed on a Public Cloud, but within the limits of a VPN (Virtual Private Network). Their benefits are:

o A mix of the two previously mentioned, but they may be very attractive to companies interested in global coverage associated with total control.

5. What Cloud Computing is not

Every major supplier of Cloud services, such as Google App Engine and Microsoft Windows Azure, offers free options for experimental use, within certain limits, allowing tests and experiments. Costs of more complex services depend on the category of the services and the volume of transactions involved. These costs, usually linked to demand, are much lower than the fixed costs of a complete installation suitable to provide equivalent services. The latter offers the opportunity to clarify some misconceptions of what Cloud Computing is not:

□ It is not the next generation nor an alternative to the Internet – but a set of functionalities that complement it;

□ It is not a free source of unrestricted virtual resources – its use depends on the adherence to policies, accountability, management and costs;

□ It “shall not conquer the world” and it will not make current data-centers obsolete – maybe small and medium sized companies will make their data-centers redundant, but large organizations and teaching institutions will continue working with them, in a joint operation with Cloud Computing;

□ It is not possible to “shut down a data Center today” and “wake up tomorrow on

the cloud” – there is a migration process that needs to be planned and carried out cautiously. The advantages will make this operation worthwhile, but it is still an operation of migration from one environment to the other.

6. Development in Cloud Computing of the Applied Technology Laboratory of Unesp
The LTIA – Laboratory of Applied Information Technology of Unesp/SP, Brazil has been developing an application of Interoperability and Cloud computing for a few years. Its main achievement has been the development in Open Source of “plug-ins”, which allow Moodle 2.0 to run on a Microsoft Windows Azure environment, demonstrating the flexibility of the Azure solution and its easy application in Education.

7. Conclusions

Cloud Computing has the potential to help teaching institutions reduce costs in their offer of access to computational learning and collaboration environments, leading to educational experiments in wider scale and offering conditions for deeper and broader experiments to be conducted by researchers using the ICTs in Education. This favors the adoption of more adequate uses promoting the improvement of both teaching and learning. Furthermore, the various application modalities of Cloud Computing allow an optimal use of resources of the current data-centers, which may be kept for activities that are less susceptible to demand fluctuations.

Professors and students will be able to increase the experience of spontaneous creation of collaborative sites and the practice of sharing information on the projects being developed, through access from home and school, allowing the discovery of new paths that favor the improvement of teaching and learning.

Finally, we can state that we are on the threshold of a new technological era, which will contribute to the expansion of the use of Information and Communication Technologies in Education, research and knowledge of the area, in as much as it generates more and more support and contributions from researchers.

(Ref - E. Martins Morgado, Education in a technological world)

EVENTS

Following Eight workshops have been organized by department –

1. Two Days workshop on “Sensor based Robotics & IOT” has been organized from 25/11/2016 to 26/11/2016 for students.
2. One Day National Workshop on “Robotics, Manual and Autonomous”has been organized from 17/10/2016 to 17/10/2016 for students
3. Entrepreneurship Awareness Camp has been organized from 01/09/2016 to 03/09/2016 for students
4. One Day workshop on” IOT” has been organized from 13/04/2017 to 13/04/2017 for students
5. One Day workshop on” PIC Microcontroller”has been organized from 10/05/2017 to 10/05/2017 for students
6. One Day workshop on” AVR Microcontroller”has been organized from 11/05/2017 to 11/05/2017 for students
7. Two Days National Workshop on "Wavelet Transform & its Applications in Signal Processing”has been organized from 04/11/2016 to 05/11/2016 for all Faculties.
8. One Day FDP on “Demonstration working & operational of Lab Equipments” has been organized from 24/04/2017 to 24/04/2017 for all Faculties.

Following is the list of Expert lecture organized in the department –

1. Expert lecture on “IoT challenges & security issues” by Dr. Vaibhav Neema on 25/04/17
2. Expert lecture on “Gap Between the Industrial Requirement and the Present Viability of Man Power” by Mr. Timir Her Mandloi on 28/03/17
3. Expert lecture on “Broadband Access Networks” by Dr. Raksha Upadhyay on 28/03/17
4. Expert lecture on “Wireless Communication” by Mr. Kalpant Pathak on 14/10/16

FACULTY ACHIEVEMENTS

Following are the research papers published by Faculty members of department of ECE.

1. "Performance Analysis of Adaptive MIMO OFDM System" by Mrs. Angeeta Hirwe in July – 2016.
2. "Efficient resource provisioning using traffic balancing in multidomain optical networks" by Dr. Dharmendra S. Yadav in Aug – 2016.
3. "Performance evaluation of MC-CDMA System over Rayleigh Fading Channel" by Mrs. Angeeta Hirwe in Oct – 2016.
4. "Overview of MIMO Technology in LTE" by Mrs. Angeeta Hirwe in Nov – 2016.
5. "A review of Vehicular Ad-hoc network QoS monitoring and their enhancement techniques" by Mr. Nilesh Sharma in Nov. – 2016.
6. "An Implimentation on Vehicular Adhoc Network QoS Enhancement using various routing protocols" by Mr. Nilesh Sharma Dec – 2016.
7. "PAPR Reduction in Weighted OFDM system and it's BER Analysis" by Mr. Nilesh Sharma in January 2017.
8. "Relay selection techniques and cluster based routing algorithms for wireless sensor network" by Mr. Nitin Jain in March – 2017.

Following is the list of workshops attended by Faculty members of Dept. of ECE-

1. Workshop on "Use of ICT in Education for Online and Blended Learning" from 02/05/2016 to 10/07/2016 by 11 faculty members.
2. Workshop on "Wavelet Transform & its Applications in Signal Processing" from 04/11/2016 to 05/11/2016 by all faculty members.
3. Workshop on "Mathematical Modeling & its Applications" from 11/11/2016 to 12/11/2016 by 10 faculty members.
4. Workshop on "CMOS Mixed Signal & Radio frequency design" from 31/01/2017 to 04/02/2017 by all faculty members.

STUDENT ACHIEVEMENTS

Four students Ms. Aanchal Gupta (4th year), Ms. Samiksha Singh (3rd year), Ms. Sakshi Singh (2nd year) and Ms. Samiksha Jain (1st year) have participated in Devang Mehta ITT Award 2016. These students have achieved First rank in their respective batches.