



**PRAGATI ENGINEERING COLLEGE**

Approved by AICTE, Permanently Affiliated to JNTUK Kakinada &  
Accredited by NAAC with 'A' Grade

# SUTANTRA

-Information of Enlighthouse

DEPARTMENT OF  
INFORMATION TECHNOLOGY

JULY-2018



## About Department

The Department of IT was established in the year 2001 to groom the student of A.P for the requirements of IT industry. The Department has emerged as a reputed center of learning in the coastal districts of Andhra Pradesh. Footprints of the department's students can be found in most of the local and global software majors. Student of this department mainly, brought glory to the college by securing University Rank. The department strives to empower the students, to achieve the demanding standards of IT industry, by bringing about a synergistic academic environment wherein cutting edge technologies, industry experts, faculty and students are engaged in a sustained interaction.

## Vision of the Institute

To emerge as a Premier Institution for Technical Education in the Country through Academic Excellence and to be recognized as a Centre for Excellence in Research & Development, catering to the needs of our Country.

## Mission of the Institute

To realize a strong Institution by consistently maintaining State-of-art infrastructure and building a cohesive, World Class Team and provide need based Technical Education, Research and Development through enhanced Industry Interaction.

## Department Vision

To attain academic excellence in the field of Information Technology and research serving to the needs of the society through technological developments.

## Department Mission

M1: To create stimulating learning ambiance by providing state-of-art infrastructure and to induce innovative and problem-solving capabilities to address societal challenges.

M2: To impart quality technical education with professional team to make the graduates globally competent to IT Enabled Services.

M3: To strengthen industry-academia relationship for enhancing research capabilities.





## PSOs for B.Tech IT Program

PSO1: Develop software programs in various programming languages learnt to create the software applications to solve the real life problems of the society.

PSO2: Excel in emerging software tools and technologies.

PSO3: Effectively transform their ideas and bring consensus for the transformation of the idea into a usable software product / application.

## PEOs for B.Tech IT Program

PEO 1: To have a successful career in IT as researchers, entrepreneurs and IT professionals satisfying the needs of the society.

PEO 2: To motivate students towards higher education and incline them towards continuous learning process.

PEO 3: To inculcate professional ethics of IT industry and prepare them with effective soft skills essential to work in teams.



## PROGRAM OUTCOMES

### 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,

### 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.



## Big Data



Big Data and Hadoop Training – Explore the Curriculum to Master Big Data and Hadoop.

Big data refers to problems that are associated with processing and storing different types of data. Most of the companies today, rely on big data analytics to gain huge insight about their: customer,

product research,

marketing initiatives and many more.

For your surprise, big data led Germany to win the world cup.

Hadoop and Spark are the two most famous frameworks for solving Big Data problems.

If you already have some knowledge of Big Data, splendid! If not, now is the time to start.

**Mrs. D Sirisha**  
Assoc Professor & HOD



## Blockchain



Blockchain Training – Explore the Curriculum to Master Blockchain.

☒ This is the tech that powers bitcoins, the whole new parallel currency that has taken over the world. ☒ Interestingly, blockchain as a technology has far-reaching potential in everything from healthcare to elections to real estate to law enforcement.

Understand how blockchain works and your career is as sorted as the secure ledger this tech is based on!

A block chain is a transaction database shared by all nodes participating in a system based on the Bitcoin protocol. A full copy of a currency's block chain contains every transaction ever executed in the currency. With this information, one can find out how much value belonged to each address at any point in history.

**Dr. S Suresh**  
Associate Professor





## Cognitive Cloud Computing



AWS Solution Architect Training – Explore the Curriculum to Master AWS.

Cognitive Cloud is an extended ecosystem of traditional Cloud and Cognitive Computing.

It's due to this, you can create Cognitive Computing applications and bring to the masses through cloud deployments. Cognitive computing is considered as the next big evolution in the IT industry.

It converses in human language and helps experts in better decision making by understanding the complexities of Big Data. Its market size is expected to generate revenue of \$13.8 billion by 2020 and is one of the top 10 trending technologies to consider this year. ☒ Big brands such as IBM, Google, Microsoft, Cisco have already started implementing this next-gen tech to gear up for the upcoming market.

**Mr. V Surya Prakash**

Assistant Professor





## Cyber Security



Cybersecurity might not seem like emerging technology, given that it has been around for a while, but it is evolving just as other technologies are. That's in part because threats are constantly new. The malevolent hackers who are trying to illegally access data are not going to give up any time soon, and they will continue to find ways to get through even the toughest security measures. It's also in part because new technology is being adapted to enhance security. As long as we have hackers, we will have cybersecurity as an emerging technology because it will constantly evolve to defend against those hackers.

As proof of the strong need for cybersecurity professionals, the number of cybersecurity jobs is growing three times faster than other tech jobs. However, we're falling short when it comes to filling those jobs. As a result, it's predicted that we will have 3.5 million unfilled cybersecurity jobs by 2021.

Many cyber security jobs pay six-figure incomes, and roles can range from ethical hacker to security engineer to Chief Security Officer, offering a promising career path for someone who wants to get into and stick with this domain.

In today's connected world, everyone benefits from advanced cyberdefense programs. At an individual level, a cybersecurity attack can result in everything from identity theft, to extortion attempts, to the loss of important data like family photos. Everyone relies on critical infrastructure like power plants, hospitals, and financial service companies. Securing these and other organizations is essential to keeping our society functioning.

Everyone also benefits from the work of cyberthreat researchers, like the team of 250 threat researchers at Talos, who investigate new and emerging threats and cyber attack strategies. They reveal new vulnerabilities, educate the public on the importance of cybersecurity, and strengthen open source tools. Their work makes the Internet safer for everyone.

**Ms. B Preethi Devi**  
Assistant Professor





## Smart Mirror



Smart mirrors are straight from science fiction. They're part of an optimistic vision of the future that imagines a world where screens and data are everywhere, ready to feed you whatever information you need at a moment's notice. Basically, the mirror looks like a normal mirror but when someone stands in front of it the scene changes. The mirror provides a functional, user-friendly and interactive UI to its user for accessing their social sites, messengers, etc. It has widgets for displaying the current weather conditions, Time, Events, Latest news headlines. The Smart Mirror would help in developing smart houses with embedded artificial intelligence, as well as finding its applications in industries. Switching home appliances becomes easy with a mirror. Virtual dressing, a smart way of having trials with your fashion sense, makes things quite easy in malls. Having such an intellectual mirror will only surge the beauty of home. The Raspberry Pi is programmed using Python and connects to a monitor with an inbuilt speaker so as to provide an onscreen interface and voice assistance as well.

A smart mirror, also known as a magic mirror, displays the time, weather, calendar, news, and social media updates. The magic is created by placing a transparent mirror over a screen such as a tablet, monitor, or TV. The technology is driven by a Raspberry Pi or Windows PC, combined with voice recognition and touch technology.

Looking to build a smart mirror? Order the glass, frame, or the entire system for your project. We specialize in manufacturing glass and acrylic mirrors that are superior to standard 2-way mirrors. Unlike a 2-way mirror, smart mirrors provide a crystal clear view of the text and graphics.

### Technology

Virtual mirrors or smart mirrors usually utilize computer vision, face detection and face tracking technologies to analyze visual patterns and represent digital information. The technology uses algorithms to collect, analyze and make meaningful inferences from data from one or multiple images.

A virtual mirror or smart mirror is a device that displays a user's own image on a screen as if that screen were a mirror. Some versions feature augmented reality additions to the video display, or use an entirely virtual graphical avatar of the user.

Virtual mirrors are available as mobile phone applications, with some allowing users to modify the appearance of their hairstyle, make-up or accessories. The technology is also used in online shopping and in-store shopping to show people how an item of makeup, clothing, handbag or accessory might look on them. Some major retailers use the technology to provide virtual dressing rooms to customers.

Many color contact sites feature a similar virtual try-on environment to simulate the look a user will achieve when actually wearing the contact lenses. The best product in this domain is Purple Patch from Wifin Technologies. The Freshlook color studio, and Colorful Eyes eye color changer are both examples of color contact sites that feature this cutting edge technology.

**Mrs. P V Komali**  
Assistant Professor





## Space Mouse



Every day of your computing life, you reach out for the mouse whenever you want to move the cursor or activate something. The mouse senses your motion and your clicks and sends them to the computer so it can respond appropriately. An ordinary mouse detects motion in the X and Y plane and acts as a two dimensional controller. It is not well suited for people to use in a 3D graphics environment

Space Mouse is a professional 3D controller specifically designed for manipulating objects in a 3D environment .It permits the simultaneous control of all six degrees of freedom - translation rotation or a combination. The device serves as an intuitive man-machine interface

The predecessor of the spacemouse was the DLR controller ball. Spacemouse has its origins in the late seventies when the DLR (German Aerospace Research Establishment) started research in its robotics and system dynamics division on devices with six degrees of freedom (6 dof) for controlling robot grippers in Cartesian space. The basic principle behind its construction is mechatronics engineering and the multisensory concept. The spacemouse has different modes of operation in which it can also be used as a two-dimensional mouse.

Mice first broke onto the public stage with the introduction of the Apple Macintosh in 1984, and since then they have helped to completely redefine the way we use computers. Every day of your computing life, you reach out for your mouse whenever you want to move your cursor or activate something. Your mouse senses your motion and your clicks and sends them to the computer so it can respond appropriately.

**Mrs. Y Srilatha**  
Assistant Professor



## PILL CAMERA

The aim of technology is to make products in a large scale for cheaper prices and increased quality. The current technologies have attained a part of it, but the manufacturing technology is at macro level. The future lies in manufacturing product right from the molecular level. Research in this direction started way back in eighties. At that time manufacturing at molecular and atomic level was laughed about. But due to advent of nanotechnology we have realized it to a certain level. one such product manufactured is PILL CAMERA, which is used for the treatment of cancer, ulcer and anemia. It has made revolution in the field of medicine. This tiny capsule can pass through our body, without causing any harm. We have made great progress in manufacturing products. Looking back from where we stand now, we started from flint knives and stone tools and reached the stage where we make such tools with more precision than ever. The leap in technology is great but it is not going to stop here. With our present technology we manufacture products by casting, milling, grinding, chipping and the likes. With these technologies we have made more things at a lower cost and greater precision than ever before. In the manufacture of these products we have been arranging atoms in great thundering statistical herds. All of us know manufactured products are made from atoms. The properties of those products depend on how those atoms are arranged. If we rearrange atoms in dirt, water and air we get grass. The next step in manufacturing technology is to manufacture products at molecular level. The technology used to achieve It takes pictures of our intestine and transmits the same to the receiver of the Computer analysis of our digestive system. This process can help in tracking any kind of disease related to digestive system. Also we have discussed the drawbacks of PILL CAMERA and how these drawbacks can be overcome using Grain sized motor and bi directional wireless telemetry capsule.

**Parts of pill camera: Optical Dome:** This shape results in easy orientation of the capsule axis along the central axis of small intestine and so helps propel the capsule forward easily.

**Lens Holder:** The lens is tightly fixed to the holder so that it doesn't get dislocated anytime.

**Lens:** The lens is an integral component of the capsule. It is arranged behind the Light Receiving Window.

**Illuminating LED's:** Around the Lens & CMOS image sensor, four LED's are present. These plural lighting devices are arranged in donut shape.

**CMOS Image Sensor:** CMOS image sensor is the most important part of the capsule. It is highly sensitive and produces very high quality images.

**Battery:** Battery used in the capsules is button shaped and is two in number as shown. The batteries are arranged together just behind the CMOS Image Sensor.

**V. Amrutha**

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## BIO CHIPS

Most of us won't like the idea of implanting a biochip in our body that identifies us uniquely and can be used to track our location. That would be a major loss of privacy. But there is a flip side to this! Such biochips could help agencies to locate lost children, downed soldiers and wandering Alzheimer's patients. The human body is the next big target of chipmakers. It won't be long before biochip implants will come to the rescue of sick, or those who are handicapped in some way. Large amount of money and research has already gone into this area of technology. Anyway, such implants have already experimented with. A few US companies are selling both chips and their detectors. The chips are of size of an uncooked grain of rice, small enough to be injected under the skin using a syringe needle. They respond to a signal from the detector, held just a few feet away, by transmitting an identification number. This number is then compared with the database listings of register pets. Daniel Man, a plastic surgeon in private practice in Florida, holds the patent on a more powerful device: a chip that would enable lost humans to be tracked by satellite.

It consists of two parts Transponder and Reader or Scanner

**Transponder:** The transponder is the actual biochip implant. It contains:

**Microchip:** The microchip stores a unique identification number from 10 to 15 digits long. The storage capacity of the current microchips is limited, capable of storing only a single ID number.

**Antenna coil:** It is coil of copper wire around a ferrite or iron core. It receives and sends signals from the reader or scanner.

**Tuning Capacitor:** It stores the small electrical charge (less than 1/1000 of a watt) sent by the reader or scanner. It activates the transponder. This allows the transponder to communicate with the scanner.

**Glass Capsule:** It is a small capsule measuring 11 mm in length and 2 mm in diameter, about the size of an uncooked grain of rice. The capsule is made of biocompatible material such as soda lime glass.

**Scanner:** It consists of an "exciter coil" to excite or activate the implanted biochip. It also carries a "receiving coil" that receives the ID number from the biochip.

### Applications:

It is widely used in monitoring pets and animals in zoos. Implanted under the skin of the animal with a unique ID number.

A biochip can store and update financial, medical, demographic data, basically everything about a person.

It is used as Glucose Detector.

Biochip as an Blood Pressure sensor.

Biochips really are potent in replacing passports, cash, and medical records.

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