

VIMAL JYOTHI ENGINEERING COLLEGE,
CHEMPERI

DEPT. OF ELECTRONICS
& INSTRUMENTATION

METRON

6th EDITION

JULY 2013

INSTRUMENTATION

Just imagine a world without instruments. It would be like traversing into a time that probably goes even beyond the Stone Age. Man has always been fascinated towards instruments and the quest to invent and innovate on new instruments has pushed mankind beyond barriers to an age where instruments have become a part and parcel of the life. Today, we find instruments at home and at workplace, and this was possible only because of the science instrumentation.

In scientific terms, instrumentation is defined as the art and science of measurement and control of process variables within a production, or manufacturing area. The science has further opened up the realm of instrumentation engineering.

Almost all process and manufacturing industry such as steel, oil, petrochemical, power and defence production will have a separate instrumentation department, which is manned and managed by instrumen-

tation engineers. "Automation is the buzz word in process industry, and automation is the core job of instrumentation engineers. Hence, the demand for instrumentation will always be there," says the professor.

The growth in the avionics, aeronautical and space science sectors has also increased the scope for instrumentation engineers. Instrumentation engineers can also fit in both software and hardware sectors.

Apart from covering core subjects such as system dynamics, industrial instrumentation and process control, analytical and bio-medical instrumentation and robotics, the students deal with software and hardware topics such as microprocessor and micro controller based instrumentation, embedded system designs, computer architecture and organization and computer control of processes. This makes an instrumentation engineer fit for both the hardware and the software industry. Moreover, since in-

strumentation engineers are presumed to be good in physics, the logical ability is expected to be on the higher side, which is a basic quality needed to excel in the software industry.

Nature of work of an instrumentation engineer ranges from designing, developing, installing, managing equipments that are used to monitor and control machinery and processes.

"Though there is a demand for instrumentation engineers from the software sector, we prefer the core area, as that is where we can showcase our creativity and knowledge,"

The shift towards core sector is not only due to the opportunity to showcase ones creative talent and knowledge, but also because of the long term stability and quick growth. Bio-medical is another area that is fast catching up and there is huge requirement for instrumentation professionals.

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Placement training conducted for S7 AEI students from 1st—3rd July 2013 by INSIGHT JOBGURU



Engineering education quality embraces the activities through which a technical institution satisfies itself that the quality of education it provides and standards it has set are appropriate and are being maintained. There is a need to develop a standardized approach to most aspects of quality assurance for engineering programmes which is sufficiently well defined to be accepted for all assessments.

Globalization and age of the internet have influenced and transformed our education system and interested our inputs in the knowledge sector.

As computers speed and software advances engineering education Will have to deal with the adapting for the digital natives living in the globalised world. Quality of this education is as crucial as quantity of output produces by industrial units , in order to enjoy appropriate benefits of technical education. In today's educational system there is a gap between the skill set needed for the profession and what the engineering graduates actually possess after graduation. This gap can be bridged through innovations in technical educations.

Engineering education is now subject to a range of formalized mechanisms as part of an overall process by which quality is assured in its various activities. These features are: Teaching; Research; Entry Standards; Student- to-staff ratio; Library and computer spend-

ing; Facilities; percentage of high degrees; graduate destinations; and completion rate. The quality of engineering and technology education is complex and challenging due to various reasons, and can be analogous to industry. Any standard industrial activity includes three different stages, such as the input, the process and the output, where feed-back closes the loop. In this process, feedback gained from the output can be utilized to improve the quality of the process.

Educational Input: The Input parameters relate to various components, including the student's intake or student's enrollment into an engineering educational process, etc, and may be comprised of the following aspects: Societal needs; New knowledge; Advancing technologies; Human and material resources; Student enrollment process; Student fees structure and Student

eligibility criteria, etc.

Educational Process: The educational process lies in between the input and the output, and this is where teaching/learning is facilitated. It may consist of the following important factors: Curriculum design; Learning styles; Learning methods; Teaching/learning facilities; Assessment methods and Staffing, etc.

Learning Outcomes: The Output component is associated with the student output after finishing the course curricula. It consists of the following elements: Academic results; Professional profile; Employability; On-the-job success rate and Social and workplace activities, etc. The quality of engineering education can be controlled and assessed according to three different approaches. On the exit where the knowledge, skills, arrangements, values acquired by the students at the time of training are verified.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

1. Graduates will achieve broad and in-depth knowledge of Electronics and Instrumentation Engineering relating to industrial practices and research to analyze the practical problems and think creatively to generate innovative solutions using appropriate technologies.
2. Graduates will make valid judgment, synthesize information from a range of sources and communicate them in sound ways appropriate to their discipline.
3. Graduates will sustain intellectual curiosity and pursue lifelong learning not only in areas that are relevant to Electronics and Instrumentation Engineering, but also that are important to society
4. Graduates will adapt to different roles and demonstrate leaderships in global working environment by respecting diversity, professionalism and ethical practices.



PROJECT 4 U . COM

CIP AUTOMATION IN A MILK PLANT

Developed by,

Dhanesh Sebastian

Clint A Jose

Jibin Devasia

In Charge,

Mrs. Reshma K V

Cleaning in place (CIP) & sterilization in place (SIP) are systems designed for automatic cleaning & disinfecting without major disassembly & assembly work. The conventional definition of CIP is the removal of process equipment & piping soil by recirculation or spray application of flush, wash & rinse solutions without the removal or dismantling of equipment. CIP automation is typically a complex part of the automation process in many instances it is more complex to automate the cleaning process than to make the product. Since the final CIP automation sequence is often defined after the process equipment is built & cleaning tests are performed.

There are many requirements for cleaning equipment as well as many cleaning types. Some process equipment is cleaned with only water while other equipment is cleaned using detergents such as acid or caustic solution. Some plants have taken to recovering the water used for a final rinse & use it as the initial rinse of the next CIP sequence in order to reduce the overall cost of production. In the dairy industry, a CIP system is typically designed as a three tank system holding chemicals, alkaline & acid & rinse water. The dairy CIP system is defined as a utility

system that its sole purpose is to hold & transfer cleaning solutions from separate holding tanks into the process equipment to perform cleaning after termination of a production batch. This dairy type CIP method release exclusively on chemical cleaning to remove/dissolve water soluble product residuals. In today's pharmaceuticals, food, dairy & biological manufacturing, cleaning the process equipment & system is crucial to the overall success of the enterprise. For large production & bulk facilities, cleaning is accomplished by a centralized CIP system & is considered as a critical utility. The cleaning can be carried out with automated systems & is a reliable & repeatable process that makes the stringent hygiene regulations demanded by the industries. Other benefits of a well designed CIP plant includes operator safety & downtime between product runs/product changeover is minimized.

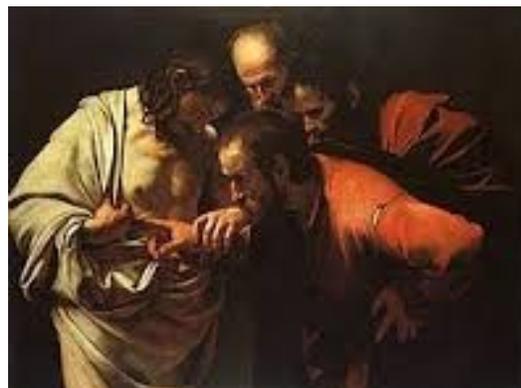


TRUST TAKES YEARS
TO BUILD
SECONDS
TO BREAK
AND FOREVER
TO REPAIR

*Celebrated St Thomas Day
on 3rd July 2013 with
great pomp & splendour*

QUIZ 4 U . COM

1. Load cells are used for the measurement of —
2. Working principle of radiation pyrometer is based on the — law
3. First empirical temperature scale developed was the __ scale.
4. An Open Loop control system is:
5. The usual range of current use in signal transmission is —
6. The device that changes one instrument signal value to another instrument signal value is known as:
7. What is the gain of a P to I convertor?



***"I HAVE
NOT
FAILED.
I'VE JUST
FOUND
10,000
WAYS
THAT
WON'T
WORK."
THOMAS
A. EDISON***

M.TECH

AICTE Approved new batch for **M.TECH IN CONTROL & INSTRUMENTATION** affiliated to Kannur University

Eligibility: B.Tech in
Electronics & Instrumentation Engg/
Electronics & Communication Engg/ Applied Electronics &
Instrumentation Engg/ Instrumentation & Control Engg

24 seats available

PLACED STUDENTS

Escube Technologies—

1. Layamol Joseph
2. Uthara Balachandran
3. Neena K
4. Abhishek T P
5. Aswini V
6. Prabitha Balakrishnan

LGB Pvt Ltd, Coimbatore--

1. Dhanesh Sebastian

NEW FACULTIES OF EIE DEPARTMENT



Mr. Akhil Jose

M.Tech in Control
Systems



Mr. Sarath T S

M.Tech in Industrial
Power & Automation



Mr. Clint Augustin

M..Tech in Control
& Instrumentation



Ms. Mary Mol

M.Tech in Control &
Instrumentation

STUDENT ACHIEVEMENTS

- **Semester 8 Result for 2009-2013 admission batch—97.83%**
- **Top three students of S8 (2009-2013 Admission):**
Layamol Joseph (85.4%), Anakha P V (83.7%), Neena K (83.3%)
- **Top three students of S8 (2008-2012 Admission):**
Nijith M George (74.9%), Shamlin Sunny (73.5%), Rohitha Rajan (73.1%)
- **Semester 7 Mini project review conducted on 5th & 6th July 2013 for 8 batches.**
- **Semester 3 students with 100 percentage attendance till 2nd July 2013:**
Akhil T & Ashwin Prem

SEMINAR HANDLED BY EIE DEPARTMENT ALUMINI

EIE Department in association with ISOI conducted a seminar for S7 & S5 students on 10th July 2013 by 2008-2012 batch student SHONE JOSE on the topic titled

“ INNOVATION DRIVEN PROJECTS”




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Student In Charge:
Aswini V

ANSWERS

1. Weight
2. Stefan-Boltzman law
3. Farenhite
4. A control system where feedback is not used.
5. 4 to 20 mA
6. Transducer

STAFF PUBLICATIONS

1. **Ms. Mary Mol Paul** “*Identification and control of a cylindrical tank based on system identification models* “ *IJTARME, ISSN: 2319– 3182 Vol.2 Issue 1 2013.*
2. **M. Clint Augustine** Participated as an invited speaker in the National conference titled ‘trends in electronics, instrumentation, embedded system and automation ’organized by the department of Electronics and Instrumentation, Karunya University, Coimbatore .
3. **Mr. Sarath T S** presented a paper named "Design and modelling of assembly robot with vision capability" International conference on intelligent interactive systems and assistive technology
4. **Ms. Divya K** “ A versatile multimedia functional unit using SPST technique”

Ms. MARY MOL PAUL receiving the Gold Medal from **Dr. PAUL DINAKARAN** for being the First Rank Holder in M.Tech Control & Instrumentation from Karunya Univer-

