WHAT YOU WILL GAIN:

• Skills and know-how in the latest technologies in all aspects of Plant Engineering
• Guidance from practicing Plant Engineering experts in the field
• Knowledge from the extensive experience of lecturers, rather than from clinical information gained from books and college
• Improved career prospects and income
• An EIT Advanced Diploma of Plant Engineering

Ensure you and your company remain at the forefront of Plant Engineering
Join the next generation of sought-after Plant Engineers
Through innovative e-learning, participate from your home or office

Visit our website: www.eit.edu.au
Introduction

Embrace a well paid, intensive yet enjoyable career by undertaking this comprehensive and practical program. It is delivered by live distance learning and presented by some of the leading Plant Engineering lecturers in the world today. There is now a critical shortage of senior Plant Engineers around the world due to retirement, restructuring and rapid growth in new industries and technologies. Many industrial enterprises throughout the world comment on the difficulty in finding experienced Plant Engineers despite paying outstanding salaries. Often universities and colleges do not teach Plant Engineering as a core subject. Much of the vital knowledge (e.g. practical maintenance planning and procedures) you need when commencing work as a qualified Plant Engineer is missing from their curricula. However, there are a few notable exceptions with some highly dedicated practitioners. Many of those universities and colleges that do teach Plant Engineering do so mainly from a theoretical point of view. Furthermore, lecturers often have insufficient experience in industry due to the difficulty in attracting good engineers from the highly paid private sector. The aim of this 18 month e-learning programme is to provide you with core Plant Engineering skills.

The program gives extensive coverage in the various fields of Plant Engineering. Subjects are covered such as Plant Operations, Facility Management, Instrument Control Engineering, Electrical Engineering, Environmental Engineering, Safety and Financial Management. Practical knowledge is not neglected; a Plant Engineer should also be well informed about metal forming, joining, heat treatment and protection.

This practical program avoids over emphasis on theory. This is rarely needed in the real industrial world where time is short and immediate results are required. Hard-hitting and usef ul know-how, are needed as minimum requirements. The lecturers presenting this advanced diploma are highly experienced engineers from industry who have many years of real-life experience as Plant Engineers. The format of presentation - live, interactive distance learning with the use of remote labs means that you can hit the ground running and be of immediate benefit to your company or future employer.

"If you want to improve career prospects and be trained by excellent trainers with a thorough knowledge of the industry and train at your own pace then I would recommend this program.”
Gary Burrowes, BHP Billiton

“This has been the best study process I have gone through and for advancing the career it is a must. The program content is extremely good and practical as I have baffled my engineers with some of the questions in the assignments making them question the content they actually studied.”
Henk Barnard

“This is ideal for people such as myself that don’t live or work in a city environment. It is the only viable way of increasing knowledge whilst working full time on a fly-in-out roster pattern.”
Brett Lapham

"When you are in a particular field and profession for a long time you rather think you know it all. This program has made me realize that there are new things to learn every day especially with the ever changing technology. ”
Stephen Dzveya

To enrol please contact enquiries@eit.edu.au

EIT Program Delivery Methodology
Not all e-learning is the same. See why our methodology is so unique and successful.
Visit:

VALUE plus!
As part of the incredible value we have built into this program, you also receive:
• Two places on any IDC Technologies public 2-day workshop*
OR
• Two places at any IDC Technologies conference [conference component only, excludes workshop if available]*
PLUS
• A library of 30 technical eBooks
All of this is valued at over US$5000!
You may also be eligible for a tax deduction on your personal income tax – contact your tax advisor for more information.

*to be used within 2 years of program enrolment and subject to availability. Your fee for this program must be up to date. The offer is for workshop or conference fee only and does not include travel, accommodation or other costs. The EIT is not responsible for cancellation or postponement of IDC Technologies workshops and conferences. Other conditions may apply at our discretion.

To the left: "If you want to improve career prospects and be trained by excellent trainers with a thorough knowledge of the industry and train at your own pace then I would recommend this program.” – Gary Burrowes, BHP Billiton
To the right: EIT Program Delivery Methodology – Not all e-learning is the same. See why our methodology is so unique and successful.

"This has been the best study process I have gone through and for advancing the career it is a must. The program content is extremely good and practical as I have baffled my engineers with some of the questions in the assignments making them question the content they actually studied.” – Henk Barnard

“This is ideal for people such as myself that don’t live or work in a city environment. It is the only viable way of increasing knowledge whilst working full time on a fly-in-out roster pattern.” – Brett Lapham

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To enrol please contact enquiries@eit.edu.au

EIT Program Delivery Methodology
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Visit:
The EIT (and many individual programs) has received recognition, endorsement and/or accreditation as a training provider from authorizing bodies based around the world, including those listed below. Please ask us for specific information for your location.

AUSTRALIA
The Engineering Institute of Technology was declared an educational institution under Section 10 of the copyright Act 1968. The notice was published in accordance with section 10A(4) of the act in the Commonwealth of Australia's Business Register. "The Engineering Institute of Technology declares that its principal function is the provision of programs of study or training for the following purpose: the continuing education of people engaged in a particular profession or occupation." – Dated 8th November 2011.

The Engineering Institute of Technology (EIT) is a private Registered Training Organization (RTO) – provider number 51971. EIT is registered with and regulated by the Australian Skills Quality Authority (ASQA). ASQA is the national regulator for Australia’s vocational education and training sector. They regulate programs and training providers to ensure nationally approved quality standards are met.

Many of the programs offered by EIT are nationally accredited and recognized qualifications and are listed on training.gov.au (TGA). TGA is the official National Register of information on Training Packages, Qualifications, Programs, Units of Competency and Registered Training Organizations (RTOs). EIT qualifications accredited to date can be viewed on EIT’s registration page on TGA under the “Scope” tab. You can find EIT on TGA by searching for our provider number – 51971. Programs listed on EIT’s scope have been approved for delivery in all Australian states and territories. Please note that many additional programs are also in the process of accreditation.

The Advanced Diploma of Plant Engineering (52489WA) is a nationally accredited and recognized qualification under the AQF. The Australian Qualifications Framework (AQF) is the national policy for regulated qualifications in the Australian education and training system. Members of Engineers Australia (EA) are entitled to claim CPD hours for private study, short programs, and learning activities at the workplace. CPD hours can be claimed for our programs in most cases, but we would always advise individual members to check with EA regarding specific programs.

NEW ZEALAND
The New Zealand Qualifications Authority recognizes individual qualifications gained overseas on a case-by-case basis. Advanced Diplomas, for example, when registered at the time of award under the Australian Qualification Framework (AQF) are typically recognized as broadly comparable to a National Diploma at level 6 on the NZQF.

SOUTH AFRICA
The Engineering Council of South Africa (ECSA) which aims to promote a high level of education and training of practitioners in the engineering profession, has validated a large number of EIT programs. Members can check details on the ECSA website. South African students who successfully complete an EIT Advanced Diploma and other qualifications have the option to apply for recognition by SAQA, who have determined in the past that an Australian Advanced Diploma program is at Level 6 in the South African National Qualifications Framework (equivalent to Higher Diploma) in South Africa’s educational system. However, in most cases formal individual recognition by SAQA is not required as the international validity and accreditation of this credential is very sound.

UNITED STATES
IEEE is the world’s largest professional association advancing innovation and technological excellence. EIT is an IEEE Continuing Education Provider. IEEE Continuing Education Programs are peer-reviewed by content experts. This peer review guarantees both quality of the technical content of learning materials, as well as adherence to IEEE’s strict criteria for educational excellence. All programs that pass this strict process are entitled to award IEEE Continuing Education Units (CEUs), recognized as the standard of excellence for continuing education programs in IEEE’s fields of interest.

The International Society of Automation (ISA) is a leading, global, non-profit organization that sets the standard for automation around the world. ISA develops standards, certifies industry professionals, provides education and training, publishes books and technical articles, and hosts conferences and exhibitions for automation professionals. ISA has reviewed the curricula of the programs offered by EIT as they relate to the instrumentation, control and automation discipline and are enthusiastic about promoting their availability to the automation community.

UNITED KINGDOM
Nationally recognised qualifications that have been achieved at EIT can be compared by UK NARIC to the UK framework. UK NARIC is the UK’s national agency responsible for the recognition of qualifications from overseas and provides services for individuals and organizations to compare international qualifications against UK qualification framework levels. UK NARIC is managed by ECTCIS Ltd (see http://www.ecctis.co.uk/naric/Default.aspx) which administers the service for the UK Government. Graduates of EIT’s Advanced Diploma programs in the UK can be confident that their international qualification has been officially evaluated as comparable to the BTEC/SDA Higher National Diploma (HND) standard/Foundation Degree Standard. A BTEC Higher National Diploma is at the same level of the National Qualifications Framework as NVD/SVO Level 4. Recognition will be at a higher level for graduate programs.

The Institute of Measurement and Control in the United Kingdom is Britain’s foremost professional body for the Automation Industry. An EIT Advanced Diploma is recognized by the Institute of Measurement and Control as contributing to the initial professional recognition required for eventual registration as Chartered or Incorporated Engineers. The Advanced Diploma is also approved by the Institute as providing CPD.

CANADA
EIT is a Participating Partner with the Engineering Institute of Canada (EIC) and EIT programs can be utilised by members to register for Continuing Education Units (CEUs). EIT’s Continuing Education Program is supported by The Canadian Council of Professional Engineers, The Association of Consulting Engineers of Canada, and The Canadian Academy for Engineering. EIC is a member of the International Association for Continuing Education and Training, with headquarters in Washington, DC.

OTHER COUNTRIES
Students who successfully complete an EIT Advanced Diploma and other qualifications may be able to apply for recognition of their qualification within the local (home country) education system. Many countries have a process for recognition of foreign qualifications which is utilised by new residents when they have qualifications earned overseas. Although you will be studying from your home country you will be awarded an Australian qualification from the EIT, so your EIT qualifications may be able to be recognized as a “foreign qualification” if you apply through your local system. If you would like to find out more, please contact your local education authorities because it is not practical for the EIT to know the systems that apply in all countries. However, in many cases formal individual recognition within the home country may not be required because the international validity and accreditation of this credential is very sound.

Members of other engineering organizations may be able to claim credit for professional development and are advised to check with their own organization.

For additional information please see http://www.eit.edu.au/international-standing.
ABOUT THE PROGRAM

The Plant Engineering function in any organization incorporates multi-various disciplines touching upon different aspects of plant operation and facility management. The advent of newer technologies has transformed this function into one that is becoming highly specialized and increasingly sophisticated. In recent times, there is huge demand for highly skilled, knowledgeable and practically oriented plant engineers. This program has been designed and structured, keeping this fact in mind. This 18 month diploma provides advanced knowledge in the area of plant engineering and is designed to develop your overall skills, boost your career options, and benefit your employer. It is a comprehensive and practical program that focuses on real systems. It is delivered by live distance learning and presented by outstanding experts from across the world. The numerous practical application tips and tricks to engineering problem solving are imparted during the program making it highly practical and relevant to your applications and its successful completion will provide a gateway to a fulfilling, intensive, yet enjoyable career.

Ease of installation, serviceability and operational and design flexibility are critical factors determining the success of any system. In order to identify and select a suitable system for a particular application, it is important that the selection and design related parameters are properly understood, besides getting a thorough grasp of the key principles involved. For example, taking into account the load characteristics and lifting considerations for material handling equipments such as hoists and cranes. This program places the tried and tested and latest practices and technologies in perspective, while also equipping the participants with the requisite knowledge and skill sets needed to tackle problems related to various systems in a facility. It is presented by lecturers who are highly experienced engineers from industry, having a mix of both extensive experience and teaching prowess. All our lecturers have been carefully selected, and are seasoned professionals. This program tackles the subject from a practical point of view and avoids weighty theory. This is rarely needed in the real world of industry where time is short and immediate results, based on hard-hitting and useful knowledge, is a minimum requirement. It is worth mentioning here that this program is not intended as a substitute for a 4 or 5 year engineering degree, but rather intended to be the distillation of key skills and know-how in modern, practical plant engineering disciplines. The topics that will be covered are derived from the acclaimed IDC Technologies’ programs attended by over 300,000 engineers and technicians during the past 20 years. The program comprises 19 modules in all, to provide you with maximum practical coverage.

Who Should Attend

Anyone who wants to gain solid knowledge of the key elements of Plant Engineering to improve their work skills and to further their job prospects:

- Electrical Engineers who need an overall Plant Engineering appreciation
- Electricians
- Maintenance Engineers and Supervisors
- Persons studying for one of the South African Engineers Certificates of Competency
- Automation and Process Engineers
- Design Engineers
- Project Managers
- Consulting Engineers
- Production Managers
- Chemical and Mechanical Engineers
- Instrument and Process Control Technicians

Even those who are highly experienced in Plant Engineering may find it useful to follow some of the topics to gain know-how in a very concentrated but practical format.

See program structure on page 5

For more information or to register, please contact us at enquiries@eit.edu.au

Presentation Format

The program features real-world applications and uses a multi-pronged approach involving interactive on-line webinars, simulation software and self-study assignments with a mentor on call. The program consists of 72 topics delivered over a period of 18 months. Presentations and group discussions will be conducted using a live, interactive software system. For each topic you will have an initial reading assignment (which will be delivered to you in electronic format in advance of the online presentations). There will be coursework or problems to be submitted and in some cases there will be practical exercises, using simulation software and remote labs that you can easily do from your home or office.

You will have ongoing support from the lecturers via phone, fax and e-mail.

Live Webinars

During the program you will participate in 72 live interactive sessions with the lecturers and other participants from around the world. Each webinar will last approximately 60 to 90 minutes, and we take student availability into consideration wherever possible before scheduling webinar times. Contact us for details of webinar session scheduling. All you need to participate is an adequate Internet connection, speakers and a microphone. The software package and setup details will be sent to you prior to the program.

Prior Learning Recognition and Exemptions

The EIT can give you full or partial credit for modules where you can demonstrate substantial prior experience or educational background. An assessment fee may apply. If you wish to find out more please ask us for your copy of the policy for recognition of prior learning.

Time Commitment for the Program

You will need to spend an estimated 6-10 hours per week. This includes the reading of the material prior to your attendance at each hour webinar and the time needed to complete assignments for submission. This time would be required to ensure the material is covered adequately and sufficient knowledge is gained to provide sound, enduring and immediately useful skills in engineering. The EIT operates almost all year long, so your studies will continue most weeks of the year to enable you to achieve the qualification in an accelerated time period when compared to a traditional semester-based system.
Program Structure
The program follows six engineering threads to provide you with maximum practical coverage in the field of Plant Engineering:

- Overview and where the Plant Engineer fits into the 21st century production sphere
- Engineering technologies in detail
- Skills for project, process, environmental and energy management
- Maintenance management
- Safety management; with corresponding legal knowledge
- Other necessary skills to master

The program is composed of 19 modules. These modules cover a range of aspects to provide you with maximum practical coverage in the field of Plant Engineering.

The modules are:

1. Introduction and Fundamentals Related to Plant Engineering and Maintenance
2. Plant Operations and Facility Management
3. Electrical Equipment and Technology
4. Pressure Vessels and Boilers
5. Mechanical Components
6. Hydraulics and Pneumatics
7. Pumps and Seals
8. Thermodynamics, Compressors, Fans and Blowers
9. Piping, HVAC and Materials Handling
10. Noise and Vibration
11. Structural and Civil Engineering Concepts
12. Project Management
13. Process Management
14. Energy Management
15. Instrument and Control Engineering
16. Maintenance Management
17. Environmental Engineering and Concepts
18. Safety Management

For detailed information on the content and breakdown of modules, see pages 13 to 31.

Entrance Requirements
This Engineering Institute of Technology advanced diploma is an accelerated, practical, work-oriented program. It is designed for engineers and technicians who have some background in the field. This includes those who have technical or ‘trade’ qualifications who want to move to the next career step, those with substantial relevant work experience who need to formalise and enhance their achievements, and those with higher level qualifications in a related field who wish to develop specialist knowledge. Practical work experience in related areas of engineering would help enormously. It would not be suitable for a student with no relevant work experience. We will review your enrolment application and may recommend pre-program studies if required.

Advanced Diploma Preparation Program
If you are unsure if you have a strong enough grasp of the fundamental knowledge required for this program, or you simply want to refresh your skills and experience e-learning in a shorter program, we recommend that you consider the EIT’s engineering studies preparation program. This intensive 4-month program covers the fundamentals of engineering maths, physics and chemistry. Please ask your advisor for the brochure. If you don’t currently have an existing qualification and/or experience, please contact us for advice. Most important, however, is a determination to persist and complete this program.

On completion of this program, 50% of the program fees can be used as a credit towards your fee for an EIT Advanced Diploma program.

Hardware and Software Requirements
All you need in order to join the webinars once registered for the program is an adequate internet connection, PC, speakers and a microphone. The software package and setup details will be sent to you prior to the program.

We are Flexible with your Commitments
We recognise that personal circumstances can make it difficult to complete the program in the time available. We will be flexible about the time you require to complete the program. You can “pause and restart” by joining a subsequent intake (a rejoining fee may apply). We will allow up to 3 years from your original start date to complete the program.

You can withdraw from the program at any time and receive a Statement of Attainment for the topics you have completed. However, completion of all 72 topics will earn you the EIT Advanced Diploma of Plant Engineering.
Practical Exercises, Remote Labs and Assignments

You will participate in practical exercises using a combination of remote laboratories and simulation software, to ensure you get the requisite hands-on experience. This will give you a solid practical exposure to the key principles covered in the program and ensure you are able to put theory into practice.

As research shows, no matter how gifted and experienced an lecturer [and we believe ours are some of the best worldwide], no one learns from an lecturer only presenting program materials to them in a lecture format. It is only by the additional activities of hands-on exercises using simulation software, remote laboratories, practically based assignments and interactive discussion groups with both your peers and the lecturer that you are able to internalize this knowledge, "take ownership of it" and apply it successfully to the real world. You should note that there is some degree of overlap between the practical sessions between the different units to reinforce the concepts and to look at the issues from different perspectives.

Traditional distance learning thus presents challenges in achieving these goals but we believe today with the modern e-learning technologies available combined with outstanding lecturers that we can achieve these goals and give you an equivalent or indeed even better experience than on a traditional university campus. Practical sessions may be added, deleted or modified by the lecturers to ensure the best outcome for students.

For more information or to register, please contact us at enquiries@eit.edu.au

About the Engineering Institute of Technology (EIT)

The key objective of the Engineering Institute of Technology (EIT) is to provide an outstanding practical engineering and technology education; from Diplomas and beyond. The finest engineering lecturers and lecturers, with extensive real engineering experience in industry, are drawn from around the world. The learning is gained through synchronous, online [e-learning] technologies.

The EIT offers awards in a growing array of engineering fields. Many (perhaps, most) engineering faculties at universities and colleges experience a significant challenge delivering the program-work affordably and with excellence. The EIT achieves this using online based education - economical class sizes are attainable, international experts are engaged to instruct and remote laboratories and simulation software are employed.

The EIT is a sister company of the well known and reputable engineering training organisation, IDC Technologies. IDC has been operating for over 20 years, from offices throughout the world, delivering practical short programs to well over 500,000 engineers and technicians.

Why EIT?

- Our lecturers are selected and recruited from amongst the top engineers/lecturers in their field - worldwide. These lecturers are highly skilled at presenting challenging concepts and ideas to students of varying levels and abilities.
- As shown in the detailed program prospectus, the programs are aimed at practising professionals giving hard-hitting practical know-how relevant to today’s market and is aimed at people working in industry. We design and select Case Studies and practical exercises in the program based upon real-world business requirements.
- Feedback from the tens of thousands of students we have trained over many years has allowed EIT a unique understanding of real world business requirements and we have tailored the program accordingly.
- We have experience in training over 500,000 engineers and technicians throughout the world and have built up a library of outstanding reference materials which focus on what engineers and technicians need in their work today in industry and mining. The value of these references is considerable and they are a great asset to industry professionals. These reference materials are included in the cost of the program.
- The program content is challenging and designed for engineers and technicians already working in industry. We assume a general understanding of the demands of the workplace. A student without practical experience would be unsuited to the program.

Program Fees

Your program fees include weekly webinars with leading engineering and technical experts, 30 technical eBooks, all program materials, software and postage, plus grading and support from the program coordinators and lecturers. We provide payment options and can accept fees in a variety of currencies. Please contact your advisor for fees in an appropriate currency for your location.
Comprehensive e-Books and Associated Documentation

You will receive 30 of our up-to-date technical e-Books to add to your library. Together these texts contain over 5000 pages of valuable know-how distilled from years of experience in presenting these programs throughout the world.

Participants only completing selected topics will receive only the relevant documentation.

1. Practical Fundamentals of Heating, Ventilation and Airconditioning (HVAC)
2. Practical Boiler Plant Operation and Management for Engineers and Technicians
3. Best Practice Design, Maintenance and Troubleshooting of Conveyors and Chutes
4. Practical Pumps and Compressors: Control, Operation, Maintenance and Troubleshooting
5. Practical Operation and Maintenance of Industrial Fans and Blowers
6. Practical Hydraulic Systems: Operation and Troubleshooting
7. Practical Lubrication Engineering for Engineers and Technicians
8. Practical Mechanical Drives (Belts, Chains and Gears) for Engineers and Technicians
10. Practical Machinery and Automation Safety for Industry
11. Practical Mechanical Seals - Selection, Maintenance and Troubleshooting
12. Practical Machinery Vibration Analysis and Predictive Maintenance
13. Practical Project Management for Engineers and Technicians
14. Practical Power Distribution
15. Fundamentals of Chemical Engineering
16. Setting Up, Understanding and Troubleshooting of Industrial Ethernet and Automation Networks
17. Practical Fundamentals of Telecommunications and Wireless Communications
18. Practical Energy Efficiency, Design, Engineering and Auditing
19. Practical Earthing, Bonding, Lightning and Surge Protection
20. Practical Power System Protection for Engineers and Technicians
21. Practical Instrumentation for Automation and Process Control
22. Practical Safety Instrumentation and Emergency Shutdown Systems for Process Industries
23. Practical SCADA Systems for Industry
24. Practical Troubleshooting of Instrumentation, Electrical and Process Control
25. Practical Balancing, Alignment and Condition Monitoring of Rotating Equipment
26. Fundamentals of Process Plant Layout and Piping Design
27. Fundamentals of Pipe Stress Analysis with Introduction to Caesar II
28. Leading Your Engineering Team to Top Performance
29. Practical Shutdown and Turnaround Management for Engineers and Managers
30. Practical Specification and Technical Writing for Engineers and Other Technical People

Please Note: Students who choose to pay upfront will receive all 30 e-Books in advance. If you opt to pay by installments you will receive e-Books periodically throughout the program. e-Books are available in hard copy at 50% of the recommended retail price. Contact us for pricing details.
“Good reputation, had attended good full-time programs previously.” Worley Parsons

“Program facilitator CV, ...reputation, e-learning flexibility.” SMK, New Zealand

“Content tends to practical and targeted.” MIPAC, Australia

“Non-vendor specific training and lower program costs with online training capabilities.” Worley Parsons

“The content of the program and the way the program was broken down were the key factors.” GEA Group

“I can do those programs at my own free time which made it more convenient for me.” Iluka, Australia

“Content was applicable to my job and industry. Taught by industry experts not academics. E-room delivery mode. Accreditation in various nations.” Sanofi Pasteur, Australia

“Because it is specialist, and so many available programs.” Kacst, Saudi Arabia

“Covered all my criteria and gave me recognised qualifications on completion.” Netafirm

“I took a previous program, IDC [associated organisation] is professional.” Cat Group

“I have done other programs with IDC [associated organisation] and was happy with the service provided.” GHD

“Had completed programs previously. Good content.” Woodside

“I understood from friends that it is good quality.” Rio Tinto

“Better choice of topic.” Rockwell RA

“Believed to be good quality based on previous training programs I have done in person.” BHP Billiton, South Africa

“It was referred to me by a colleague and I have attended seminars run by IDC before. The program that I am currently enrolled in also had all the outcomes I was looking for to further my career.” Rio Tinto

“The program content was relevant to my work environment and practical.” Alcoa

“I have done a few IDC programs in the past and found them to be very good and delivered by people with practical knowledge of the subjects.” Kalgold

“It provides good online program delivery including its quality support structures.” OneSteel

“Program interest and content.” ABB, Australia

“The fact I could do it online and it was in line with furthering my knowledge for work.” CAED, Australia

“It ticked all the boxes ... quality, suitability, depth, length.” Powerco, New Zealand

“Better choice of topic.” Rockwell RA

“Program was visible and relevant.” Schneider Electric, UK

“Convenience.” Rio Tinto

“To be perfectly honest with the small amount of research on various programs I did the programs are generally the most relevant to my area of work. That’s not to say they are perfect but they seem to be superior to others readily available in this part of the world.” WEL Networks, New Zealand

“Program content seems practical and applicable. I already have a BSc where the focus is on the theory.” BHP Billiton, South Africa

“Industry recognition and recommendation by colleagues.” Rio Tinto

“Seemed the most convenient option, and it was!” CPIT, New Zealand

“Program content ease of study option.” Nestle, South Africa

“The content of the program made up my mind.” Transportadora de gas del Norte, Argentina

“Their programs are standard and program material as well as lecture are okay.” Shell, UK

“Its international recognition with body endorsing certification. Easy to attend lessons after work hours. Easy way of program payment.” Kinyara Sugar Ltd, Uganda

“The most practical and technical offerings by the most qualified lecturers for distance learning.” Encana Natural Gas

“On line references, price, and various time frames available to sit in on the class. Also, one more important item was being able to converse with the lecturer and class instead of working totally on my own.” Mitchell Technical Institute

“Program content. Accreditation of the training institution. Cost.” MODEC

“Offer the correct program, timing and affordable cost.” Folec, Brunei

“Possibly the most recognised online institution within my industry.” DRA, South Africa
Frequently Asked Questions

What are the advantages of studying online?

We know that many potential students have part or full-time employment as well as family commitments, so finding the time to study a classroom-based program is not always possible. Many students also have geographical, travel and time limitations and do not have an accessible institution or training provider. We have taken this into consideration and developed an affordable, flexible, online approach to training. This means that you can study from anywhere, with minimum downtime from work – but still have the necessary interactive learning experience. The software we use does not require very fast Internet connection or a sophisticated computer. A basic connection and hardware are sufficient.

What are the fees?

The EIT provides distance education to students located almost anywhere in the world – it is one of the very few truly global training institutes. Program fees are paid in a currency that is determined by the student’s location. A full list of fees in a currency appropriate for every country would be too complex list here and, with today’s exchange rate fluctuations, difficult to maintain.

To find out the fees for your location, contact us at enquiries@eit.edu.au.

What do I need?

A PC, an adequate Internet connection, speakers and a microphone. A headset is recommended. The necessary software and program materials are provided by us.

Doesn’t it get boring? How can an e-Learning program be interactive?

Boredom can be a real risk in any form of learning; however, we use an interactive approach to our e-Learning – with live sessions (instead of recordings) for most presentations. The webinar software allows everyone to interact and involves participants in group work, including hands-on exercises with simulation software and remote laboratories where possible. You can communicate with text messages, or live VoIP speech, or can even draw on the whiteboard during the sessions. This all helps to keep you motivated and interested.

What do live webinars involve?

These are live, interactive sessions over the Internet. You will join the lecturer and other participants from around the world in an online ‘virtual classroom’ where you are able to watch a presentation, and communicate with the lecturer and other students via audio, text messaging or drawing on the whiteboard. Each webinar is between 60 and 90 minutes in duration and the sessions may be scheduled at 2 or 3 different times, depending on class size, during the presentation day. This allows you to select the session which is most convenient.

What if I cannot join or I miss a live webinar?

Webinars are recorded and available to students upon request. One requirement of the program is that you join at least 70% of the live sessions. The live webinars offer the opportunity to interact with the lecturer and other participants from around the globe - an essential yet enjoyable part of the learning process.

Circumstances such as on-site work can make attendance difficult at times. These situations need to be clearly communicated with your e-learning coordinator. Feedback from the recordings may be required and assessment submission maintained.

When will the sessions take place? When will I receive a webinar schedule?

The webinar schedule is not put together until after registrations close. The reason for this is that the program is promoted globally and we often have participants from several time zones. When you enrol you will receive a questionnaire which will help us determine your availability. When all questionnaires are returned we create a schedule which will endeavour to meet everyone’s requirements.

Each webinar may run 2 or 3 times during each presentation day and we try our best to ensure that at least one session falls into your requested time frames. This is not always possible, however, due to the range of locations of both lecturers and students. If you are unable to attend the webinars scheduled, we do have some options available. Contact the EIT for more details.

Can I complete the program in less time?

Our programs actually require ‘attendance’ and participation at the live webinars. The interaction which takes place is an important part of the learning process. Our experience has shown that the interactive classes work exceptionally well and students are far more likely to stay motivated, enjoy the program, and complete the program successfully. See also ‘What if I cannot join or I miss a live webinar?’ In addition, accelerating the program would be quite onerous for most students.

How much time do I need? How long is the program?

The program reading and assignments may consume anywhere from 6 to 10 hours per week. This will vary depending on the program subject matter and your existing knowledge.

The EIT does not use a traditional semester-based system, which means that you can complete the qualification faster without long breaks. Each advanced diploma program is delivered over an intensive 18 months. We do break for about 4 weeks per year for traditional festive seasons.
International Expert Speaker Faculty

Your team of professional lecturers and facilitators are drawn from experts in their field. They will work closely with you for the duration of the program. Please note: Lecturers are subject to change. Students will be notified in the event new lecturers join the faculty.

GUEST SPEAKER AND PROGRAM LECTURER

RICHARD E. MORLEY

Richard E. Morley, best known as the father of the Programmable Logic Controller (PLC), is a leading visionary in the field of advanced technological developments. Mr. Morley [Dick] is a member on the Board of Directors of various companies across the United States and has worked in high tech industries since the beginning of solid-state electronics.

He is currently Chairman of the Board of NCMS (National Center for Manufacturing Sciences) and has a proven track record in the founding of successful high-tech companies for where he provides initial product concept and a continuing technological presence.

He is a nationally recognized expert in the field of computer design, artificial intelligence, automation and is an authority on the factory of the future. Mr. Morley is an engineer, consultant and inventor. His inventions include the PLC [Programmable Logic Controller], which now stands in the Smithsonian Institute. He holds more than twenty United States and foreign patents. Mr. Morley is well known as a lecturer, has written extensively for such publications as Manufacturing Systems magazine and Manufacturing Automation magazine. He has published many works of his own. His latest book, 'Out of the Barn', was published in October 2002 and another book, 'The Technology Machine', was published in September 1999. Mr Morley founded the angel investment group, the Breakfast Club. He is currently an active member with this group of investors having participated in more than 100 startup companies in the New Hampshire area.

He was the former Director of Advanced Technologies for Gould, Inc. He is a Gould Fellow of Science and Engineering, a Fellow of SME, Bios LP and ICS. In addition, he was awarded the 1990 Entrepreneur of the Year by Inc. magazine, Merrill Lynch and Ernst and Young.

He is a 1991 recipient of The Franklin Institute’s Howard N. Potts Medal, and holds the Prometheus Medal placing him into the Automation Hall of Fame. International IEN ranked him 3rd in the “Top 100 Most Significant Industrial Products of the 20th Century” for his work with the PLC.

In October 1999, ISA [Instrumentation, Systems and Automation Society] honored him with the “Life Achievement Award” and Fortune magazine awarded him their “Heroes of Manufacturing Award” in March 2000.

Recognized as one of the giants in the field by the Engineering Society of Detroit, he has extensive experience in high-tech consulting and is involved in new product development at the highest management levels. Currently he works out of his barn in New Hampshire where he and his wife have been home to more than two dozen foster children.

LECTURER

John Lawrence  BSc [Hons] MSc BCom [Hons]

In today’s hyped up world, one is hesitant to describe anyone as ‘outstanding’, but John Lawrence has distinguished himself over the last 15 years with excellent program reviews.

John was extensively associated with the Diamond and Gold mining industries in Southern Africa, and has over 20 years of experience as a project and departmental manager for a multinational oil company, focusing on designing and managing the infrastructure of the telecommunications, data communications and IT systems.

In the past 5 years, John has worked extensively for a number of multi-national clients, managing projects including facilities management, budgeting and financial forecasting.

When John is not consulting or lecturing, he enjoys increasing his own skills by reading and writing about state-of-the-art technology topics and how to optimise Return On Investment (ROI) for the overall IT infrastructure. John is a dedicated professional who has trained engineers and technicians throughout the world.

LECTURER

Roland Green  Mechanical Engineer / Estimator

Roland brings more than 20 years of experience in engineering and estimating fields, gained mostly in South Africa. He has worked on many projects spanning the minerals industry, including power stations, coal stockyards and manganese. Over the past two years Roland has been extensively involved with major projects across Western Australia ranging from $460 Million to projects of more than a few Billion dollars.

Key projects include: Kusile Power Station Coal Stockyard, Kalagadi Manganese, Medupi Power Station, Minproc RIO TINTO Ramp Conveyor.
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LECTURER
John Piperides

John is a professional electrical engineer with over 25 years experience in industrial maintenance, production, management, sales and improvement. He has held management positions in several manufacturing and sales companies. His diverse responsibilities have included contract negotiation, authoring and responsibility of departmental budgets, daily management of over 20 reports, practice of cGMP, auditing in a pharmaceutical plant, and system administration and programming of diverse IT and embedded systems. He has been directly involved with industries including building management, pest control, mining, power utilities, food, pharmaceutical, steel, building products, sugar, paper and pulp, rail and airports.

John has completed many years of further education including developing, writing and delivering many work based programs and seminars. He has spent 10 years as a part time teacher at TAFE in electrical engineering, and 15 years delivering structured programs in thermography, power quality, instrument safety, motor drive theory, PLC, SCADA, and pest inspection.

LECTURER
Robert Snaith  HND (Mech.Eng)

With over 30 years of experience in fluid transport systems and associated equipment, Rob has done the hard yards. After graduating he commenced work immediately in Fluid System Applications Engineering. In later years, Rob expanded his focus to the management of the national and international distribution networks of a major international fluid sealing and transport equipment manufacturer.

In the past decade as a private consultant, he has worked extensively in designing and troubleshooting complex fluid transport systems and equipment.

When not working long hours on the design, commissioning and troubleshooting of pumps, pipelines and associated equipment, Rob squeezes some time in for his Harley Davidson motorbike and scuba diving expeditions. He has done many presentations and workshops throughout the world and was placed in the world's top three in an international, “Train the Trainer” exam during a workshop in Boston, Massachusetts in 1998.

One of his passions and sources of enjoyment is instructing technical programs and he is in constant demand both locally and internationally. No matter whether you have very little knowledge or are a veritable guru; you will be sure to take away valuable information from his programs.

LECTURER
Dr Cornie Scheffer  BEng(Mech), MEng, PhD

Cornie is an engineer who combines a deep understanding of the theoretical aspects of engineering with a passion for the practical applications of the technology. He is currently Associate Professor at Stellenbosch University and is responsible for numerous consulting and research projects that are done in close collaboration with industry, with a special focus on mechanical design and mechatronic systems throughout the world. He has designed and commissioned numerous mechanical products and automation systems for industry.

Cornie is also an experienced lecturer on a wide range of topics within mechanical engineering, including mechanical design, maintenance, mechanical vibrations, structural mechanics and mechatronics. Through the years he has prepared and presented workshops on these topics to over 1,000 engineers and technicians worldwide, including the USA, Europe, Australia, South Africa and the Middle East. He is also the author and co-author of numerous technical papers, published locally and internationally. His book on Predictive Maintenance has just been released to the largest technical publisher in the world - Elsevier.

Cornie presently consults to a wide variety of industries and is a passionate teacher that follows a hands-on approach in his workshops. His enthusiasm and down-to-earth manner makes for an enjoyable and instructive program.

LECTURER
Tom Neillings  Dip EE, Dip Bus Mngmt

Tom started his career as an engine fitter in the RAF. After leaving the RAF Tom worked in oil and gas North Sea projects. During this period he gained valuable experience and knowledge of diesel power generating systems operating in harsh environments. Tom continued his career in South Africa with a short period in Saudi Arabia.

Tom's down-to-earth and practical, yet entertaining approach makes him a sought after speaker and lecturer. His enthusiastic approach to training coupled with his helpful nature is guaranteed to maximise the learning outcome for his students.
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LECTURER

Haresh Khemani  B.E [Mechanical] from University of Pune

Haresh Khemani is passionate about Mechanical Engineering, and teaching and writing. In a career spanning over 17 years he has gained extensive industrial experience in the area of utilities, which provides him command in this field to teach and provide consultancy. Haresh has worked in the installation, erection, and commissioning of utility plants, such as air compression plants, water chilling plants, central air conditioning systems, chlorine liquefaction plants, diesel generators, and payloader etc. He has been responsible for the maintenance and operations of the above plants, along with boiler plants, and various types of pumps and blowers.

As a lecturer at the SSVPS College of Engineering, Haresh has taught his favorite subjects including Refrigeration and Air Conditioning (HVAC), Thermodynamics, Automobile Engineering, Power Plant Engineering and Industrial Instrumentation. He has written program materials on HVAC and other subjects for multiple companies including IDC.

One of his major involvements has been with www.brighthub.com, where he and his team have published more than 2500 articles covering various areas of engineering. He has personally written more than 400 articles for the website.

Over the years, Haresh has specialized in the fields of utilities of which HVAC is the major part. He has worked in the industry as HVAC consultant and has also written a number articles and program materials in this field.

For more information or to register,
please contact us at enquiries@eit.edu.au
Module 1: INTRODUCTION AND FUNDAMENTALS RELATED TO PLANT ENGINEERING AND MAINTENANCE

Duration: 2 WEEKS

You will learn how to:

1. Define and describe the organisation of the plant engineering function and the role of the plant engineer
2. Detail and assess the considerations in site selection of a plant
3. Detail and evaluate plant location and layout
4. Describe and assess industrial building requirements
5. Detail and evaluate electricity requirements for a plant
6. Detail and evaluate fuel requirements for a plant

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

This module contains a detailed description of the plant engineering function and the responsibilities and activities of the plant engineer. It assesses the various criteria involving site selection and plant layout, while also detailing the requirements regarding security, ventilation, maintenance, fire, flooring, lighting, electricity etc.

THE PROGRAM

Topic 1.1
DEFINITION AND ORGANIZATION OF THE PLANT ENGINEERING FUNCTION
- Plant engineering function
- Principles of organization
- Organization structures
- Organizational prerequisites

ROLE OF THE PLANT ENGINEER
- Legal responsibilities
- Activities
- Knowledge areas

CONSIDERATIONS IN SITE SELECTION
- Topography
- Environmental considerations
- Design considerations
- Access
- Site drainage including storm water and trade effluent
- Water supply and storage
- Drainage and site ability to contain contaminated water
- Sewage treatment considerations (may not be an onsite function, could be regarded as a specialist function)
- Discharge of effluents

Topic 1.2
PLANT LOCATION AND LAYOUT
- Services – water, electricity, effluent discharge
- Ecology and pollution
- All forms of atmospheric pollution and emission control systems

INDUSTRIAL BUILDINGS
- Approval
- Occupancy and various regulations regarding statutory and hazardous tasks
- Carbon foot print assessment
- Green energy and technology
- Security
- Fire detection and suppression
- Ventilation
- Building maintenance and repairs
- Flooring, lighting and insulation considerations
- Accommodation of plant and equipment

ELECTRICITY
- Determining the site requirements
- Tariff structures and billing calculations
- The various areas of consumption
- Characteristics of these areas including the electrical supply parameters
- Basics of electrical networks in industrial installations
- Generation, local and remote for continuous and stand by supply
- Distribution of power to areas of control and consumption
- Instrumentation techniques and general practices

FUEL
- Types including solid and liquid
- Energy content
- Applications
- Piping design and conformity assessment criteria
- Distribution systems
- Delivery
- Storage facilities
You will learn how to:

1. Evaluate material handling requirements in a facility and select the correct type of equipment
2. Implement effective pollution control and waste disposal techniques
3. Evaluate fire safety requirements in a facility and detail measures to reduce fire related risks
4. Identify toxic hazards in the workplace and formulate guidelines for safe disposal of toxic and radioactive materials
5. Implement good housekeeping practices
6. Devise measures aimed at controlling noise and vibration
7. Assess water treatment needs
8. Evaluate the principles of cooling systems
9. Examine the management of HVAC and electrical systems, and discuss computer networks available within a facility

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

Material handling equipments form a vital part of any plant operation and it is important that they are properly sized and selected, especially with regard to load and safety. It is also important to understand how solid and liquid wastes in a facility are to be disposed. Another important aspect of plant operation is to identify all possible sources of pollution, fire, toxic hazards, noise and vibration and devise ways of dealing with them. All these topics are dealt with in adequate detail, during the program of the discussion. On completion of this module, you will be well conversant with the methods employed for water treatment as also the basic principles of water cooling systems. The need for effective HVAC communication and intelligent control is adequately emphasized.

THE PROGRAM

**Topic 2.1**

**MATERIAL HANDLING**
- Selection and types of equipment
- Load considerations for various transportation devices
- Maximum legal loads that lifting equipment must adhere to
- Safety issues
- Open and closed conveyor system operation

**AIR POLLUTION CONTROL**
- Sources of pollution
- Consequences and legal requirements
- Particulate control mechanisms
- Control devices

**SOLID AND LIQUID WASTE DISPOSAL**
- Solid and liquid wastes in a facility
- Characteristics of solid and liquid wastes
- Waste control and utilization
- Legal requirements
- Solid and liquid waste control system components

**Topic 2.2**

**FIRE PROTECTION AND PREVENTION**
- Underlying causes of fire in a facility
- Eliminating risks
- Fire protection equipment
- Fire control
- Fire detection and suppression systems

**TOXIC HAZARDS AND RADIATION**
- Identifying hazards – Workplace survey
- Nature of contamination
- Guidelines for safe storage and disposal of toxic materials
- Radiation hazards and safeguards

**HOUSEKEEPING**
- Maintaining a clean and orderly working environment
- Good housekeeping practices
- 5 “Ss”, Six Sigma, 20 keys systems for compliance

**Topic 2.3**

**NOISE AND VIBRATION CONTROL**
- Source of noise and vibration
- Measurement of sound
- Human response
- Legal requirements
- Noise monitoring
- Vibration measurement and analysis
- Vibration tools and sample reports
- Effects of vibration on rotating equipment
- Sound insulation
- Vibration isolation

**WATER TREATMENT**
- Need for treatment
- Types of systems requiring treatment
- Chemistry of the various systems
- Methods of treatment
- Preventing contamination
- Wastewater treatment systems
- Various chemical additives and their roles in water treatment
- Different treatment mechanisms, i.e., corrosion, oxygen scavenging, legionnaire bacteria control etc.

**Topic 2.4**

**WATER COOLING SYSTEMS**
- Basic principles of cooling systems
- Cooling towers
- Evaporation rates
- Calculation of circulating rates
- System volume
- Treatment systems
- Absorption and compression cooling systems
- Refrigerant properties and applications
- Design of industrial cooling systems
- Control
- Efficiency calculations

**MANAGEMENT OF ELECTRICAL SYSTEMS**
- Supply security
- Component identification and characteristics
- Switchgear integrity auditing
- Protection protocol
- Safety hazards and considerations
- Periodic inspections and reviews
- Identification of internal networks
- Maintenance
- Switching protocol and safe working procedures
- Live working safety measures
- Lock out systems

**Topic 2.5**

**HVAC COMMUNICATIONS**
- HVAC components
- Operational parameters
- Statutory inspection for pressured systems
- Maintenance procedures
- HVAC control concepts
- Intelligent control
- Distributed control systems
- Building heating and cooling days for efficient management
- Avoidance of the “sick” building syndrome

**Topic 2.6**

**COMPUTER NETWORKS**
- An appreciation of the various computer networks that are available for industrial applications and their advantages and disadvantages.
Module 3: ELECTRICAL EQUIPMENT AND TECHNOLOGY

Duration: 8 WEEKS

You will learn how to:

1. Detail power generation mechanisms and methods
2. Differentiate between AC vs. DC and single-phase vs. three-phase power
3. Assess the selection criteria, operational parameters and maintenance requirements for prime movers and variable speed drives
4. Examine the role of PLC in automation
5. Examine how power transmission and distribution systems are designed
6. Outline the design requirements for electrical protection systems
7. Evaluate the requirements for explosion protected equipment and lightning protection
8. Identify and troubleshoot electrical system faults

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

This module describes the nature, type and technology associated with electrical equipment in a facility. A comparative study of AC and DC transmission is made and their relative merits and demerits discussed. The operating principles of AC motors are evaluated and a clear distinction made between constant and variable speed drives. Any discussion of electrical systems would be incomplete without a discussion on the characteristics of different types of prime movers. The design principles of power transmission, distribution and protection systems are covered in adequate detail. The significance of PLCs and their role in automation is also brought into focus. This module will further prepare you to effectively deal with electrical system faults through proper diagnosis and remedial action.

THE PROGRAM

Topic 3.1
POWER GENERATION METHODS
- Fundamentals of power generation
- Methods employed for power generation
  - a comparative study
- Rotating and static components
- Static and dynamic vibration detection techniques including remedial guidelines

AC POWER VS. DC POWER
- Alternating and direct current fundamentals
- AC vs DC transmission
- Common applications
- Relative merits and demerits

Topic 3.2
SINGLE PHASE AND THREE PHASE AC POWER
- Single-phase vs. three-phase
- Applications
- Operating principles of single-phase and three-phase AC motors
- Induction vs. synchronous motors
- Maintenance requirements
- Check lists and specification tools for effective maintenance
- Efficiency calculations

PRIME MOVERS
- Comparative study of IC engines, gas/steam turbines, hydraulic/air motors, electric motors
- Selection criteria and applications
- Maintenance requirements
- Check lists and specification tools for effective maintenance
- Efficiency calculations

Topic 3.3
VARIABLE SPEED DRIVES
- Drive components
- Operating parameters
- Component identification
- Energy conversion in electric drives
- Constant speed VS. variable speed
- Application range of variable speed drives
- Maintenance requirements
- Check lists and specification tools for effective maintenance
- Efficiency calculations

Topic 3.4
PLC AND AUTOMATION
- PLC concepts
- Introduction to PLC hardware
- PLC fundamentals
- Role of PLC in automation

Topic 3.5
ECONOMICS OF POWER SUPPLY
POWER TRANSMISSION AND DISTRIBUTION SYSTEMS
- Technology of power transmission - industrial systems
- Components

- Sub-station equipment including earthing and touch potentials
- Primary feeders and network systems
- Distribution transformers
- Secondary systems
- Distribution capacity
- Design and operation of distribution systems
- Power factor equipment
- Capacity improvement
- Harmonic influences

Topic 3.6
DESIGN OF PROTECTION SYSTEMS
- Protective equipment used in power systems
- Operation of fuses, circuit breakers, protective relays and insulators
- All aspects of earth leakage protection
- Motor protection devices
- Switching equipment for electrical systems
- Maintenance systems
- In service testing
- Primary and secondary current injection methods
- OEM parameter to compare with the test results

METHOD OF EARTHING PROTECTION
- Purpose of earthing
- Importance of earthing
- Earthing systems
- Component selection for functional earthing

Topic 3.7
EXPLOSION PROTECTED EQUIPMENT
- Hazardous area identification
- Area classification
- Calculation of the Zone [now category] extent
- Explosion prevention techniques
- Selection of the correct technique for the identified hazard, gas, vapor, dust etc.
- Introduction to the various codes of practice in force across the world
- The ATEX requirements
- Mechanical glands and types of cable approved for the area
- Earthing requirements
- Minimum energy transfer [intrinsic safety concepts]
- Standards

LIGHTNING PROTECTION
- Lightning protection risks
- Risk assessments as per IEC 62305-2
- Need for lightning protection
- How a lightning protection system works
- Physical installation
- Design of the system

Topic 3.8
TROUBLESHOOTING ELECTRICAL SYSTEM FAULTS
- Identify the various electrical systems
- Selection of the faulting technique
- Typical electrical system faults
- Diagnosing failures
- Troubleshooting procedures for electrical systems
Module 4: PRESSURE VESSELS AND BOILERS

Duration: 4 WEEKS

You will learn how to:

1. Evaluate the basic design principles and assess the selection criteria and legal safety requirements for pressure vessels
2. Examine the fundamental principles of industrial boilers and steam generation and identify the various components and their functions
3. Examine all aspects of boiler safety and assess the importance of inspections and the statutory requirements associated with them
4. Compare and contrast basic combustion equipment design and types, and discuss common applications

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

This module helps you grasp the basic design principles of pressure vessels, while also examining the various selection criteria and legal requirements associated with them. Also, the fundamental principles of steam generation are dealt with separately. The discussion specifically focuses on the common boiler types, operational principles, boiler components and associated equipment. A special effort is made to underline the importance of boiler safety during operation, along with related design and repair standards, emergency procedures and functional safety aspects.

THE PROGRAM

Topic 4.1 PRESSURE VESSELS
- Basic design principles
- Name plates details
- Internal and external inspections
- Pressure vessel selection
- Legal safety requirements
- Safety valve maintenance

Topic 4.2 INDUSTRIAL BOILERS AND STEAM GENERATION AND UTILIZATION
- Combustion theory and steam generation fundamentals
- Boiler types and applications
- Auxiliary equipment
- Components
- Inspections
- Log sheets
- Statutory inspection

Topic 4.3 BOILER SAFETY
- Legal requirements
- Good operating practice
- Safety for start up and shut down
- Emergency procedures
- Access to, and knowledge of design and repair standards
- Third party inspection concepts
- Category classification of the pressure components
- Safety valve design and operation
- Safety concepts for all the functions
- Blow down operation
- Water treatment concepts
- Efficiency calculations

Topic 4.4 COMBUSTION EQUIPMENT
- Basic designs and types
- Common applications
Module 5: MECHANICAL COMPONENTS

Duration: 5 WEEKS

You will learn how to:

1. Evaluate the design principles for various types of gears, couplings and bearings, examine selection criteria and assess load capacities
2. Explain the concepts related to shaft alignment and rotor balancing
3. Examine the design principles and selection criteria for belt, gear and chain drives
4. Outline the operation and performance criteria for brakes and clutches
5. Identify the operating principles and applications of agitators and mixers

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

This module deals with the selection, design, performance and load characteristics of important mechanical components such as gears, couplings, bearings, belts, chains, clutches and brakes. The importance of shaft alignment and rotor balancing is stressed upon during the discussion and the different alignment and balancing procedures are explained clearly. The discussion is rounded off with a detailed overview of the design and principle of operation of agitators and mixers, along with their applications.

THE PROGRAM

Topic 5.1
GEARS, COUPLINGS, BEARINGS
- Gear geometry and types
- Gear load carrying capacity
- Gear selection
- Gear lubrication
- Backlash and adjustment
- Rigid and flexible couplings
- Service factoring and load characteristics
- Universal joints
- Broad classification of bearings – rolling and sliding contact
- Bearing selection considerations
- Bearing loads
- Bearing lubrication, clearance and pre-loading
- Vibration analysis
- Remedial actions

Topic 5.2
SHAFT ALIGNMENT AND ROTOR BALANCING
- Consequences of misalignment
- Factors influencing alignment procedure
- Alignment techniques and tolerances
- Rotor balancing concepts
- Balancing methods
- Balancing machines and field balancing

Topic 5.3
BELT, GEAR AND CHAIN DRIVES
- Flat and V-belts
- Selection of belts
- Belt materials
- Service factors
- Selection of chains and sprockets
- Chain types and lubrication
- Drive selection
- Service factoring

Topic 5.4
CLUTCHES AND BRAKES
- Classification of clutches
- Hydraulic couplings and torque converters
- Brake types and applications
- Lining materials
- Brake selection and performance

Topic 5.5
AGITATORS AND MIXERS – OPERATING PRINCIPLES AND APPLICATIONS
- Static and dynamic mixers
- Mixing principles
- Agitator design and operation
- Agitator applications
- Blade design
- Bearing and sleeve design
Module 6: HYDRAULICS AND PNEUMATICS

Overview
In this module, the basic concepts associated with hydraulics and pneumatics are presented in a simple, yet detailed manner. The module provides you with a good working knowledge of the fundamental concepts and operation of hydraulic and pneumatic systems and their underlying principles. During the program of the discussion, one not only gets to understand the functions of the various hydraulic and pneumatic system components, but also obtain a good overall perspective from the point of view of design, maintenance and application.

THE PROGRAM

You will learn how to:
1. Examine the fundamental concepts related to the field of hydraulics and pneumatics
2. Evaluate the basic hydraulic principles and identify system components
3. Evaluate the basic pneumatic principles and identify system requirements

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview
In this module, the basic concepts associated with hydraulics and pneumatics are presented in a simple, yet detailed manner. The module provides you with a good working knowledge of the fundamental concepts and operation of hydraulic and pneumatic systems and their underlying principles. During the program of the discussion, one not only gets to understand the functions of the various hydraulic and pneumatic system components, but also obtain a good overall perspective from the point of view of design, maintenance and application.

THE PROGRAM

You will learn how to:
1. Examine the fundamental concepts related to the field of hydraulics and pneumatics
2. Evaluate the basic hydraulic principles and identify system components
3. Evaluate the basic pneumatic principles and identify system requirements

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview
In this module, the basic concepts associated with hydraulics and pneumatics are presented in a simple, yet detailed manner. The module provides you with a good working knowledge of the fundamental concepts and operation of hydraulic and pneumatic systems and their underlying principles. During the program of the discussion, one not only gets to understand the functions of the various hydraulic and pneumatic system components, but also obtain a good overall perspective from the point of view of design, maintenance and application.

THE PROGRAM

You will learn how to:
1. Examine the fundamental concepts related to the field of hydraulics and pneumatics
2. Evaluate the basic hydraulic principles and identify system components
3. Evaluate the basic pneumatic principles and identify system requirements

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.
Module 7: PUMPS AND SEALS

Duration: 3 WEEKS

You will learn how to:
1. Examine the operating principles and applications of pumps
2. Evaluate packing and sealing principles
3. Discuss lubrication theory and implement good lubrication practices

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview
Any discussion on mechanical systems would be incomplete without touching upon the operating principles and performance parameters of a critical equipment such as a pump. This is what this module aims at focussing on. The operating principles and performance considerations of pumps are explained in a simple yet effective manner, to enable easy understanding. This module further underlines the importance of implementing good lubrication practices and the setting up of an effective lubrication regime.

THE PROGRAM

Topic 7.1
PUMPS - OPERATING PRINCIPLES AND APPLICATIONS
• Basic pump types and classification
• Operating principles
• Pump performance charts
• Pump performance parameters and factors affecting them
• Pump selection
• Pumps in series and parallel
• Efficiency calculations
• System curve calculation
• Variable speed drive advantages

Topic 7.2
PACKING AND SEALING PRINCIPLES
• Sealing and packing principles – an overview
• Static and dynamic sealing
• Common seal types and applications
• Common packing types
• Simplex and duplex seals
• Mechanical seals
• Leak path concepts

Topic 7.3
LUBRICATION THEORY AND PRACTICE
• Friction and the importance of lubrication
• Metallic wear
• Lubrication theory and types
• Lubricant selection
• Good lubrication practices
Module 8: THERMODYNAMICS, COMPRESSORS, FANS AND BLOWERS

Duration: 2 WEEKS

You will learn how to:

1. Identify fundamental thermodynamic concepts and principles
2. Describe the operating principles and applications of compressors, fans and blowers

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

In this module, the fundamental thermodynamic concepts are presented in a vivid yet simple manner, to enable easy understanding. Compressors, fans and blowers play a significant role in determining the overall efficiency of mechanical systems in general. Therefore any discussion on mechanical systems must necessarily involve a study of the operating principles and performance parameters of these equipments. Simple ways of performing performance and efficiency related calculations are also presented during the program of the discussion.

THE PROGRAM

Topic 8.1
THERMODYNAMIC CONCEPTS AND PRINCIPLES
- Basic thermodynamic concepts
- Working substance and thermodynamic processes
- State of a system and its transformations
- Ideal gases
- Equilibrium state
- Laws of thermodynamics

Topic 8.2
COMPRESSORS, FANS AND BLOWERS – OPERATING PRINCIPLES AND APPLICATIONS
- Operating principles of compressors
- Compressor classification
- Design and operation
- Compressor staging
- Compressor safety considerations
- Operating principle of fans
- Common fan configurations
- Methods of applying fans
- Blower types and operating principles
- Blower applications
- Inter cooler and after cooler design
- Compressor efficiency calculations
Module 9: PIPING, HVAC AND MATERIAL HANDLING

Duration: 4 WEEKS

You will learn how to:

1. Assess considerations related to piping design, layout and insulation
2. Examine the design aspects of HVAC systems
3. Evaluate the working principles and design of heat exchangers
4. Evaluate the principles of material handling including conveyors, elevators, hoists and cranes

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

The discussion commences with a detailed overview of piping fundamentals, piping types and components comprising the piping system. The participants will be able to fully comprehend and understand all issues ranging from design, layout, arrangement, and routing, to proper sizing and selection. This module evaluates the design principles of HVAC systems in adequate detail, while also examining the operation and selection aspects of various types of heat exchangers. The design criteria for material handling equipments of the likes of elevators, conveyors, cranes and hoists are described separately. The importance of various safety and legal requirements related to material handling equipments is also emphasized.

THE PROGRAM

Topic 9.1
PIPING SYSTEMS AND LAYOUT AND PIPING INSULATION
- Piping system fundamentals
- Piping system components
- Piping types
- Piping design and layout
- Pipe routing
- Coefficient of linear expansion
- Design for steam systems
- Conductive and convective heat transfer
- Insulation types and materials

Topic 9.2
HEATING, VENTILATION AND AIR-CONDITIONING
- Fundamental aspects of HVAC systems
- Indoor and outdoor design conditions
- Indoor air quality
- HVAC system design and operation

Topic 9.3
HEAT EXCHANGER PRINCIPLES AND DESIGN
- Principle of working of heat exchangers
- Classification and types
- Thermal design, rating and nomenclature
- Fundamental aspects of heat exchanger design and selection
- Heat exchanger fouling
- Applications of the thermodynamics principles
- Maintenance of heat systems
- Heat exchange calculations
- Efficiency calculations
- Shell and tube heat exchanges
- Plate heat exchanges
- Operational calculations

Topic 9.4
MATERIAL HANDLING EQUIPMENT – CONVEYORS, ELEVATORS, HOISTS AND CRANES
- Principles of material handling and load considerations
- Introduction to material handling equipment
- Lifting considerations
- Static electricity generation
- Design and operational features of conveyors, elevators, hoists and cranes
- Safety and legal requirements
Module 10: NOISE AND VIBRATION

Duration: 3 WEEKS

You will learn how to:

1. Evaluate the fundamentals of noise and vibration and apply the principles of noise and vibration control
2. Implement vibration monitoring and analysis as a predictive maintenance tool
3. Identify and assess mechanical system faults and failures and implement troubleshooting techniques

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

The discussion commences with an overview of the fundamentals of noise and vibration and the human response to it. The various techniques involved in noise and vibration control are described clearly. On completion of this module, you will recognize the importance of vibration monitoring as a predictive maintenance tool. This module also aims at equipping you with the necessary skills at diagnosing and troubleshooting mechanical system faults and to undertake remedial measures aimed at preventing such failures.

THE PROGRAM

Topic 10.1 FUNDAMENTALS OF NOISE AND VIBRATION
- Introduction to acoustics
- Vibration basics
- Fundamentals of human response to sound and vibration
- Noise and vibration control

Topic 10.2 - OPC SPECIFICATIONS VIBRATION MONITORING AND ANALYSIS
- Vibration analysis as a predictive maintenance tool
- Fault detection and diagnosis using vibration analysis
- Vibration monitoring and analysis techniques

Topic 10.3 TROUBLESHOOTING MECHANICAL SYSTEM FAULTS AND DIAGNOSING FAILURES
- Typical problems affecting mechanical equipment
- Fault indicators
- Diagnosing failures
- Mechanical troubleshooting techniques
Module 11: STRUCTURAL AND CIVIL ENGINEERING CONCEPTS

Duration: 8 WEEKS

You will learn how to:

1. Discuss the theory of structures and the fundamental concepts related to stress, strain, torsion, shear force, bending moment and fatigue
2. Apply the principles of soil mechanics
3. Identify common building materials and construction principles
4. Design simple structures and examine the design procedures for steel and concrete components, roof systems and drainage
5. Differentiate between various types of structures and perform simple structural analysis
6. Evaluate the principles of construction management

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

A proper understanding of the structural and civil engineering concepts is best ensured by a study of the theory of structures and the fundamental concepts of stress, strain, bending moment, torsion, fatigue etc. One must make a clear distinction between the various types of structures, in order to perform effective structural analysis. It is also important that the principles of soil mechanics be understood clearly and to evaluate the design aspects of simple structures and roof systems.

THE PROGRAM

Topic 11.1
THEORY OF STRUCTURES
- Strength, stiffness and stability of beams
- Plastic theory
- Load factor
- Deflection and stability

Topic 11.2
STRESS AND STRAIN CONCEPTS
- Definitions
- Stress-strain relationship

TORSION, SHEAR FORCE AND BENDING MOMENT
- Basic concepts and fundamentals

Topic 11.3
FATIGUE AND TEMPERATURE STRESSES
- Stages of fatigue
- Stress ratio
- Thermal expansion phenomenon
- Low and high temperature stresses

Topic 11.4
SOIL MECHANICS AND FOUNDATION
- Fundamentals of soil mechanics
- Structure of earth
- Soil mineralogy
- Particle size distribution
- Foundation materials
- Foundation types
- Loads and resistances

Topic 11.5
BUILDING MATERIALS AND CONSTRUCTION
- Common building materials
- Classification of building materials
- Basic properties of building materials
- Concrete and steel applications
- Recent trends in building material technology
- Environmental considerations
- General construction principles

Topic 11.6
DESIGNING SIMPLE STRUCTURES
- Columns, beams, using section tables, applying moment of inertia,
- Bending moment and shear force diagrams

DESIGN PROCEDURES FOR STEEL AND CONCRETE COMPONENTS
DESIGN OF ROOF SYSTEMS, DRAINAGE

Topic 11.7
STRUCTURAL ANALYSIS
- Classification of structures
- Loads on structures
- Analysis of statically determinate and indeterminate structures
- Force and displacement analysis methods

Topic 11.8
PRINCIPLES OF CONSTRUCTION MANAGEMENT
- Construction management in practice
- Strategic management and decision-making techniques
- Managing people
- Budgeting and costs
Module 12: PROJECT MANAGEMENT

Duration: 7 WEEKS

You will learn how to:

1. Describe project life cycles, define project tasks and examine factors responsible for project success and failure
2. Estimate project costs and perform financial and risk appraisal and analysis
3. Define organization structures and work breakdowns
4. Apply the key rules of critical path analysis (CPA) and examine how scheduling of resources and personnel is undertaken
5. Identify the components of a procurement management system and examine the process of managing progress through monitoring, reporting and schedule updating

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

This module describes the project life cycles and examines factors responsible for the success or failure of a project. While it is important to define project tasks, one must also know how to estimate project costs accurately. The organization structures and work breakdowns must be clearly defined, while also ensuring that resources and personnel are properly scheduled. Application of the principles of critical path analysis (CPA) is another key issue related to project management. Another crucial aspect is the procurement process and knowledge of the components comprising a procurement management system.

THE PROGRAM

Topic 12.1 PROJECT LIFE CYCLES
• Introduction and phases of the project life cycle

FACTORs RESPONSIBLE FOR SUCCESS OR FAILURE
• Success/failure factors in relation to initial project definition
• Success/failure factors during project execution
• Primary objectives – cost, performance, time

Topic 12.2 DEFINITION OF PROJECT TASK
• Importance of initial project definition
• Projects difficult or impossible to define
• Feasibility studies to improve early project definition
• Checklists
• Enquiries and proposals for new projects
• Contractor’s strategy and design specification
• Specifications for internally funded development projects
• Developing and documenting the project specification

Topic 12.3 ESTIMATION OF PROJECT COSTS
• Introduction
• Classification of estimates according to confidence
• Estimating accuracy in relation to prices and profits
• Version control of project cost estimates
• Approaches to cost estimation of large projects – Top-down or Bottom-up
• Compilation of task list
• Level of detail in cost estimation
• Formats for estimation
• Estimation of manufacturing costs
• Personal estimating characteristics
• Material and equipment cost estimates
• Reviewing the cost estimates

Topic 12.4 FINANCIAL APPRAISAL AND RISK MANAGEMENT
• Project feasibility analysis
• Perspectives of project investor and contractor
• Project financial appraisal methods
• Project funding

• Introduction to project risk management
• Identification of risks
• Risk appraisal and analysis
• Insurance

Topic 12.5 ORGANIZATION STRUCTURES AND WORK BREAKDOWNS
• Benefits of effective organization and communication
• Organization charts
• Matrix organizations
• Project teams and task forces
• Concept of work breakdown structures

CRITICAL PATH NETWORKS
• Activity network
• Critical path

KEY RULES OF CRITICAL PATH ANALYSIS (CPA)
• Use of GANTT charts – advantages and limitations
• PERT charts, use of MS “Project”
• Network notation systems

Topic 12.6 SCHEDULING RESOURCES AND PERSONNEL
• What resources to schedule?
• Resource scheduling and the use of charts
• Role of critical path networks in resource scheduling
• Specifying the resources for each activity
• Conflict between project time and resource limits
• Personnel allocation
• Scheduling considerations for personnel

Topic 12.7 PROCUREMENT MANAGEMENT
• Components
• Procurement process overview
• Procurement systems
• Emerging techniques

MANAGING PROGRESS
• Progress monitoring, reporting and schedule updating
• Progress meeting
• Project progress reports
Module 13: PROCESS MANAGEMENT

Duration: 3 WEEKS

You will learn how to:

1. Outline the theories, concepts and principles of process management
2. Describe process operations, structures and characteristics, and define control philosophy
3. Define the characteristics of control systems and various controller types
4. Implement HAZOP study techniques

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

This module helps you to fully comprehend the theories and principles of process management. Process operations, structures and characteristics are described in adequate detail, while the characteristics of control systems and controllers are clearly defined. The procedures involved in HAZOP study are clearly defined.

THE PROGRAM

Topic 13.1
THEORIES, CONCEPTS AND PRINCIPLES OF PROCESS MANAGEMENT
- Process management principles and practices
- Capabilities of process management systems
- Integration of people and systems

CONTROL SYSTEMS AND CONTROLLER TYPES
- Characteristics of open-loop and closed-loop systems
- Genesis of feedback control theory
- Feed-forward feedback control structure
- Performance of control systems
- Controller system types – pneumatic, electrical, electronic

Topic 13.2
PROCESS OPERATIONS
- Process structures and characteristics
- Optimization of process operations

CONTROL THEORY AND CONTROL MODES
- Chemical reactions
- Exothermic and endothermic reactions
- Control philosophy

Topic 13.3
HAZOP STUDY AND PROCEDURES
- Basic features
- Purpose of HAZOP study
- Detailed study procedure – description, generating a deviation, identifying causes, evaluating consequences, safeguards, recommended action, recording
- Organizing a Hazop study

SPECIFIC APPLICATIONS
Module 14: ENERGY MANAGEMENT

Duration: 2 WEEKS

You will learn how to:

1. Evaluate the principles of energy conservation and management
2. Identify the principles of energy optimization and examine the design and operation of systems for optimum energy utilization
3. Estimate energy costs for buildings and examine the concept of energy saving through intelligent buildings
4. Examine and perform energy auditing and analysis

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

The principles of energy conservation and management are clearly explained in this module. In view of the huge energy requirements of today, it is always prudent that systems are designed for optimum energy utilization. While making you familiar with the methods used to estimate energy costs and perform energy auditing and analysis, this module also examines the concept of intelligent buildings and their role in effectively managing energy requirements.

THE PROGRAM

Topic 14.1
PRINCIPAL CONCEPTS
- Fundamentals and principles of energy management
PRINCIPLES OF ENERGY CONSERVATION
- Managing an effective energy conservation program
- Modern energy conservation techniques
- Continuous conservation monitoring
OPTIMIZATION OF ENERGY
- Reducing energy losses and increasing efficiency
- Process integration for enhanced efficiency

Topic 14.2
OPERATION AND DESIGN OF SYSTEMS FOR OPTIMUM ENERGY UTILIZATION
- Introduction to optimum energy utilization technologies
- Designing an optimal energy system
- Principles of dynamic power management
BUILDING MANAGEMENT
- Estimating energy costs for buildings – space heating, hot water supply, cooling loads
- Energy saving systems for buildings
- Intelligent buildings
ENERGY AUDITING AND ANALYSIS
- Purpose and benefits of energy auditing
- Energy audit preliminaries and outcomes
- Measurement of primary energy consumption
- Monitoring energy consumption
- Data analysis
You will learn how to:

1. Evaluate the fundamental principles of instrumentation and control in industrial plants
2. Identify the various modes of control, controller and transmitter types and control room equipment
3. Describe the function of PLCs and other logic devices
4. Define the role of regulators and final control elements and their operation
5. Select and size control valves

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

Control systems and instrumentation are used to control various critical parameters in industrial plants and one must therefore be fully conversant with the different modes of control, control equipment and controller and transmitter types employed in the control process. Along with defining the role of regulators and final control elements, this module also contains a detailed description of the function of logic devices such as PLCs. Another important part of the control engineering function is the correct selection and sizing of control valves.

THE PROGRAM

Topic 15.1
INTRODUCTION TO BASIC INSTRUMENTATION
- Role of instrumentation and control in industrial plants
- Principles of industrial instrumentation
- Fundamentals and characteristics of measuring systems

CONTROL THEORY
- Basic concepts and control loops
- Modes of control

TRANSMITTERS AND CONTROLLERS
- Design and operating principles
- Controller and transmitter types

CONTROL ROOM EQUIPMENT
- Overview of single loop process controllers and distributed control systems
- Supervisory control and data acquisition systems

Topic 15.2
PLCS AND OTHER LOGIC DEVICES
- Introduction
- Basic PLC components
- PLC sizing and selection
- Relay types and features
- Time delay relays
- Solid state logic devices

Topic 15.3
REGULATORS AND FINAL CONTROL ELEMENTS
- Dampers and louvres
- Linear and angular positioning of machine controls
- Principles of flow, level, pressure and temperature regulators
- Thermostats and humidistats
- Operation of variable-speed drives

CONTROL VALVE SELECTION AND SIZING
- Selecting a control valve for a particular application
- Valve sizing for liquid, gas and vapor flow
- Software tools for valve sizing
Module 16: MAINTENANCE MANAGEMENT

Duration: 4 WEEKS

You will learn how to:

1. Evaluate key maintenance principles and objectives and recognize the important role played by maintenance in the upkeep of plant machinery and equipment
2. Examine asset management including how assets are identified, classified, prioritized and maintained
3. Recognize the significance of maintenance planning and examine the planning and scheduling of outages
4. Evaluate the effectiveness of maintenance and the use of key performance indicators
5. Perform failure root cause analysis (RCFA) and implement reliability centered maintenance (RCM)
6. Examine and benchmark best organizational practices

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview
Another key organizational function is maintenance management and this module assists you in evaluating key maintenance principles and recognizing its importance in the upkeep of plant equipment. It enables a better understanding of how assets are identified, classified, prioritized and managed. The role of maintenance planning in ensuring the success of a maintenance plan is emphasized. After completion of this module one would get a clear idea of implementing standard maintenance practices such as reliability centred maintenance (RCM), performing root cause failure analysis and benchmarking best organizational practices.

THE PROGRAM

**Topic 16.1**

**MAINTENANCE OBJECTIVES AND PRINCIPLES**
- Effective management of maintenance operations and resources
- Measures for achieving maintenance objectives
- Key maintenance principles

**ROLE OF MAINTENANCE IN THE UPKEEP OF PLANT MACHINERY AND EQUIPMENT**
- Primary role of maintenance
- Benefits associated with best maintenance practices

**ASSET MANAGEMENT**
- Identifying, classifying and prioritizing assets
- Location and types
- Maintenance strategies for various categories of assets
- Managing assets by criticality

**Topic 16.2**

**MAINTENANCE PLANNING**
- Planning needs and objectives
- Planning for resources
- Maintenance budgeting
- Implementing the maintenance plan
- Maintenance inventory
- Reasons for planning failures
- Benefits of planning

**PLANNING AND SCHEDULING OUTAGES**
- Scheduling considerations and requirements
- Proper scheduling of resources and materials
- Priority system and equipment criticality
- Maintenance schedules
- Managing maintenance backlogs

**Topic 16.3**

**EFFECTIVE MAINTENANCE MANAGEMENT**

**MAINTENANCE TOOLS, STRATEGIES AND TECHNIQUES**
- Types of outages
- Maintenance plans, tools and techniques
- Standard maintenance practices
- Choosing the right maintenance strategy

**KEY PERFORMANCE INDICATORS**
- Performance measurement
- Evaluating maintenance effectiveness
- Reporting and use of key performance indicators

**FAILURE ROOT CAUSE ANALYSIS**
- Introduction to root cause analysis
- RCFA methodology
- Procedure
- Preventing reoccurrence of failure

**Topic 16.4**

**RELIABILITY CENTERED MAINTENANCE**
- Introduction to RCM
- Plant registration
- Function and failure
- Preventive action
- Organizing and controlling proposed tasks
- Implementation of RCM

**BENCHMARKING BEST PRACTICES**
- Equipment availability
- Inventory and purchasing benchmarks
- Benchmarking labour resources
- Preventive maintenance
- Maintenance repair
- Fasteners and other standards
- Benchmarking cost comparisons
- Maintenance staffing
- Maintenance and equipment performance
- Maintenance training
- Hidden factors in benchmarking
- Repair functions: joining, forming, heat treating, protection of metals
Module 17: ENVIRONMENTAL ENGINEERING AND CONCEPTS

Duration: 2 WEEKS

You will learn how to:

1. Design to achieve good indoor air quality (IAQ)
2. Identify the properties and effects of dust, and examine the implementation of environmental management systems

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

This module deals with the fundamental environmental engineering concepts and ways of putting in place an effective environmental management system. An important component of the environmental management function is to identify the common sources of dust and its effects and to design for good indoor air quality (IAQ).

THE PROGRAM

Topic 17.1
INDOOR AIR QUALITY
- Introduction
- Typical effects on occupants
- Design choices for good IAQ

PROPERTIES AND EFFECTS OF DUST
- Common sources of pollution from dust
- Common components of dust
- Prevention and control

Topic 17.2
HEALTH AND SAFETY MANAGEMENT
- Environmental Management Systems and their implementation
Module 18: SAFETY MANAGEMENT

You will learn how to:

1. Evaluate safety considerations in the workplace, identify, assess, monitor and review risks and implement safe working practices
2. Identify hazards and implement healthy workplace initiatives to ensure the health and safety of personnel
3. Assess the role of safety in the success of a maintenance plan and design an effective safety management plan

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

Overview

The need for workplace safety programs is examined in this module, along with identifying, assessing and monitoring risks at the workplace. The success of a safety plan can be guaranteed by implementing safe working practices and ensuring the health and safety of personnel.

THE PROGRAM

Topic 18.1
SAFETY CONSIDERATIONS IN THE WORKPLACE
- Need for workplace safety programs
IMPLEMENTING SAFE PRACTICES AND SAFETY MEASURES
- Workplace safety programs and their purpose
- Responsibility for workplace safety programs
- Identifying, assessing, monitoring and reviewing risks
- Best practices
ENSURING HEALTH AND SAFETY OF PERSONNEL
- Safety hazards and health – an overview
- Healthy workplace initiatives
- Legal framework

Topic 18.2
ROLE OF SAFETY IN THE SUCCESS OF A MAINTENANCE PLAN
- Symbiosis of safety and maintenance
- Safety co-relation with planned and reactive maintenance procedures
PUTTING IN PLACE AN EFFECTIVE SAFETY MANAGEMENT PLAN
- Elements of a good safety management plan
- Implementation of an effective safety plan
**Module 19: PEOPLE AND FINANCIAL RESOURCE MANAGEMENT**

**Duration:** 1 WEEK

**You will learn how to:**

1. Examine the finance function, the allocation of budgetary resources and discuss effective inventory control
2. Recognize the importance of proper supervision and control, and discuss effective labour management in the workplace

For the detailed assessment criteria of each learning outcome, please contact your EIT Learning Advisor or Program Coordinator.

**Overview**

This module defines the various soft skills required as part of the larger plant engineering function. These include a grasp of the finance fundamentals, effective allocation and management of resources and inventory control, ensuring proper supervisory control and enforcing workplace discipline.

**THE PROGRAM**

**Topic 19.1**

**PEOPLE AND FINANCIAL RESOURCE MANAGEMENT**

- Finance for the plant engineer
- Effective allocation of budgetary resources
- Effective inventory control
- HR supervision concepts
- Effective labour management
- Implementing workforce discipline