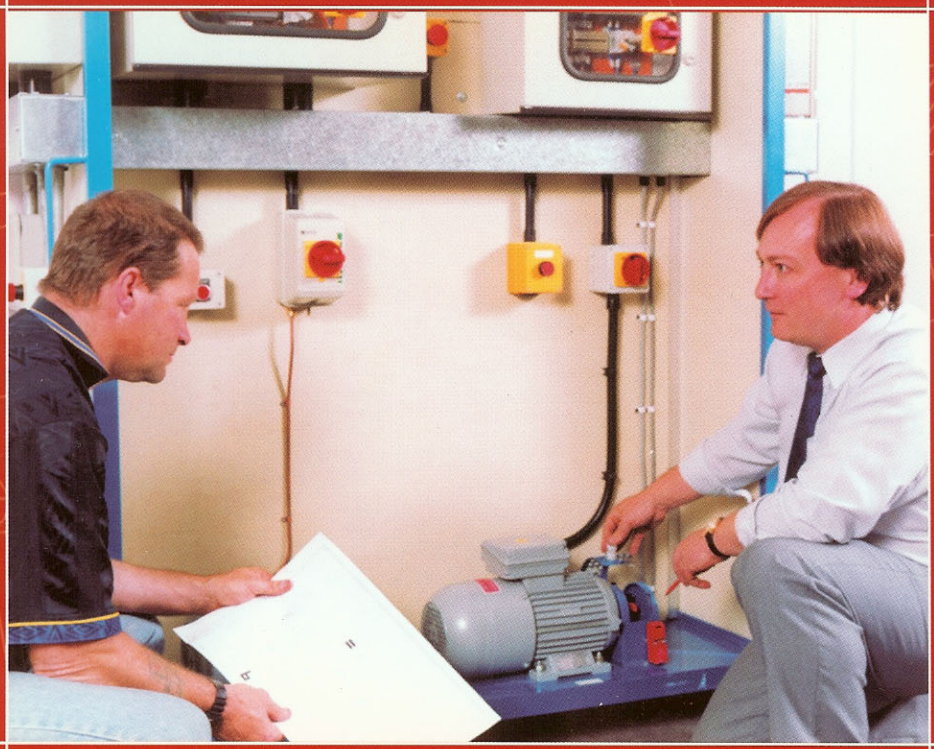
PROSPECTUS 2001

The National College of
Electrical &
Mechanical Engineering

AEEU



The National College of Electrical & Mechanical Engineering...

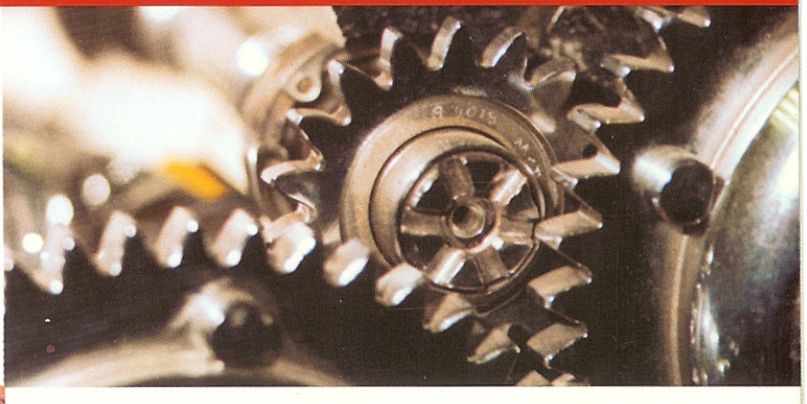
The AEEU's National College provides business and industry in the UK with a unique and valuable service. It is the authoritative body for engineering training provision, having firmly established links with all major professional and vocational engineering bodies. From its base at Cudham Hall in Kent, the College reaches out throughout the length and breadth of the UK - bringing expertise in all areas of engineering training via Regional and Specialist Training Centres - providing to industry the very best in quality training provision.

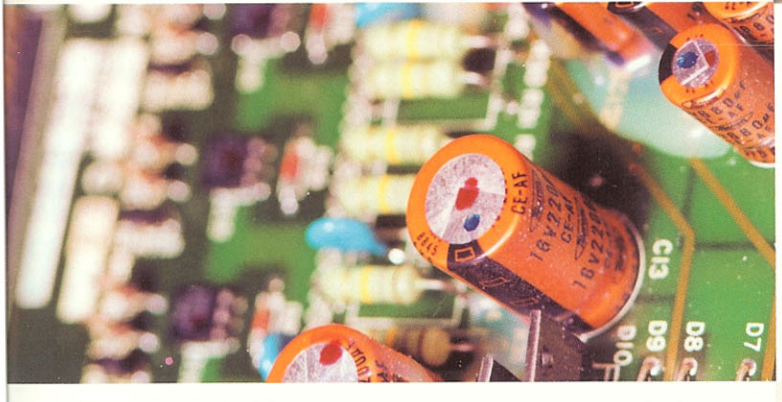
...the professional training body.

ELECTRICAL

SCHEDULED COURSES FOR 2001

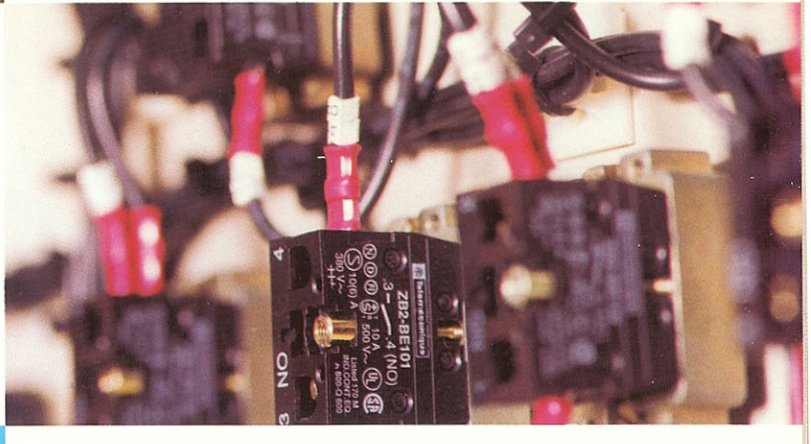
MECHANICAL

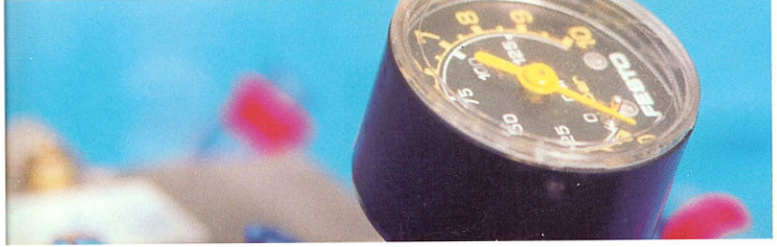




ELECTRONICS & COMPUTERS

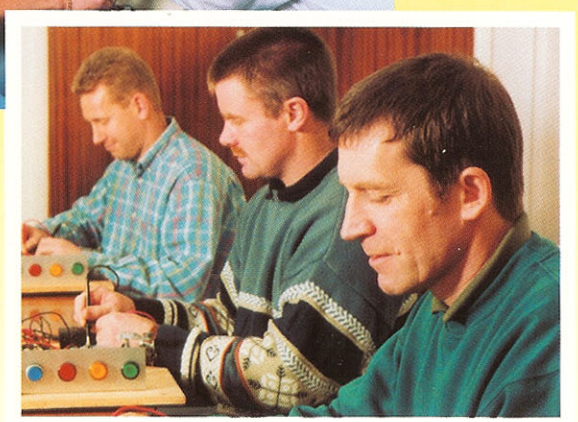
INDUSTRIAL CONTROL





HYDRAULICS & PNEUMATICS

YOU CHOOSE
WHERE THE TRAINING TAKES PLACE



Option 1
AT YOUR OWN SITE

Many companies prefer to hold courses at their own site. Let us bring the course to you - including all the necessary equipment and training aids. Delivering training at your site allows course contents to be tailored to your specific needs, and where appropriate we can utilise your plant and systems to make your training programme even more relevant.

Option 2
AT CUDHAM HALL, KENT

THE COMPLETE ENGINEERING TRAINING SERVICE

Your business or department could benefit from any one of a number of services the AEEU National Engineering College is able to offer:

- **'OFF-THE-SHELF' COURSES** covering a wide range of engineering disciplines
- **TAILOR-MADE TRAINING** provision to meet company-specific requirements
- **SKILLS FLEXIBILITY** training packages for maintenance departments
- **SOURCING**, and management of specialist training provision
- **CO-ORDINATION** of complex training packages
- **GUIDANCE** on the on-site consolidation of training
- **TASK ANALYSIS** and **SKILLS AUDITS**
- **ASSESSMENT, ACCREDITATION** and **CERTIFICATION** of training provision
- **CONSULTANCY SERVICES** - providing expert guidance on statutory and non-statutory regulative requirements in all areas of industrial engineering

Our residential training facility is ideal for companies which prefer training to be delivered off-site, away from day-to-day distractions. The regularly run scheduled courses are suitable where companies wish to release just one or two people at a time. We are easily accessible by road or rail and accommodation can be provided if required.

PROFESSIONAL TRAINING AT A COMPETITIVE PRICE

How much do these services cost? You may be pleasantly surprised. With our policy of competitive pricing they may not cost as much as you might think - and you can rest assured that you are getting the most professional and comprehensive engineering training service available.

CHOOSE THE BEST TRAINING FOR YOUR STAFF

the very best in effective engineering training

The National College has had considerable experience in the implementation of training throughout Britain in a wide range of industry and commerce - and importantly, it is training that gets results. Many engineering managers will appreciate that not all training provision achieves the desired effect. Experience has shown us that many companies encounter unsuccessful and costly attempts at engineering training prior to coming to us. We strive to ensure that your training programme attains your objectives. We are proud to have provided successful and effective training programmes that have achieved real benefits for thousands of UK companies, including many market leaders.

SCHEDULED COURSES

Run throughout the year at Cudham Hall in Kent - you will find details in this prospectus of our most popular scheduled courses. Our bookings department will advise you on dates / availability of places, etc. and our training advisers will be pleased to discuss the contents of the courses and their suitability for your needs.

training designed for your business

TAILOR-MADE TRAINING

Like many companies, you may prefer us to tailor courses to your specific requirements. Whatever your training needs, whatever field of engineering you are in, we can probably provide what you are looking for. Whilst most courses are presented by our own teaching staff, if you require very specialised training we can provide for your needs by bringing in the necessary expertise. Not only are we able to design courses to be of specific relevance to your equipment, your systems, and your processes - but we will put into effect the necessary assessment procedures, so that no matter how special or unique the training, on successfully completing a course your staff can be awarded AEEU National College certification for their efforts.

training the best in the engineering and manufacturing sectors

BBC

Ford

TATE & LYLE

Brittania Zinc Limited

ALLIED DISTILLERS LIMITED

POWERGEN

McVITIE'S

MANAGING YOUR TRAINING PROGRAMME

Let us help you with the co-ordination of your training. In managing your training programme we protect your interests - we source the best trainers for your needs and because of our 'buying power' we are able to ensure that you receive the training at competitive rates. Furthermore, we monitor the training your staff receive, ensuring that it achieves your objectives and meets our high standards of provision. We can carry out evaluation and assessment on your behalf and offer important guidance on the on-site consolidation of training. All of these services would be included as part of your training package, at very reasonable rates and with no hidden extras.

CERTIFICATION & ASSESSMENT

NATIONAL ENGINEERING COLLEGE CERTIFICATION

AEEU Competence Certification offers a new and unique system of certification - designed to meet the needs of those in industry where short, specialised training courses are increasingly in demand in order to respond rapidly to change.

ASSESSMENT OF PRACTICAL SKILLS

This nationally recognised qualification gives recognition for the gaining of practical skills and knowledge - allowing far more flexibility than the traditional forms of qualification normally associated with apprentice training. Certification can be awarded for achievement in courses tailor-made to your requirements. Because AEEU Certification is based on the assessment of competence - on what a person can do - it provides a benchmark for the provision of training within the NVQ framework of assessment.

Kellogg's

3M

CHAMPION

BP

CARNAUD METALBOX

BICC Cables

Armitage Shanks

ICI

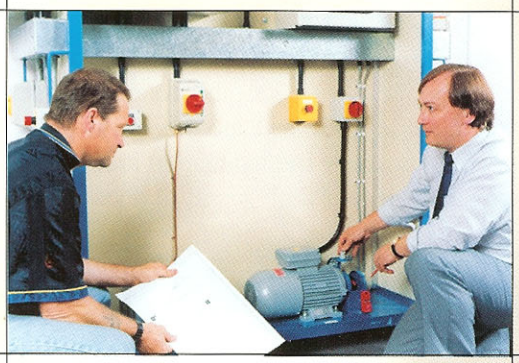
ROLLS ROYCE

BRITISH AEROSPACE

BNFL

ZENECA

RECKITT & COLMAN EUROPE



As an engineering or training manager considering 'flexible/ multi-skill' training, you will naturally have certain questions in mind:

... how do I ensure the safety of my staff in performing new duties?

... is it possible that such training can convey genuine skills that will have a practical use?

... how do I ensure that training provision is converted into real cost benefits?

THE KEY TO FLEXIBILITY

emphasis on safety

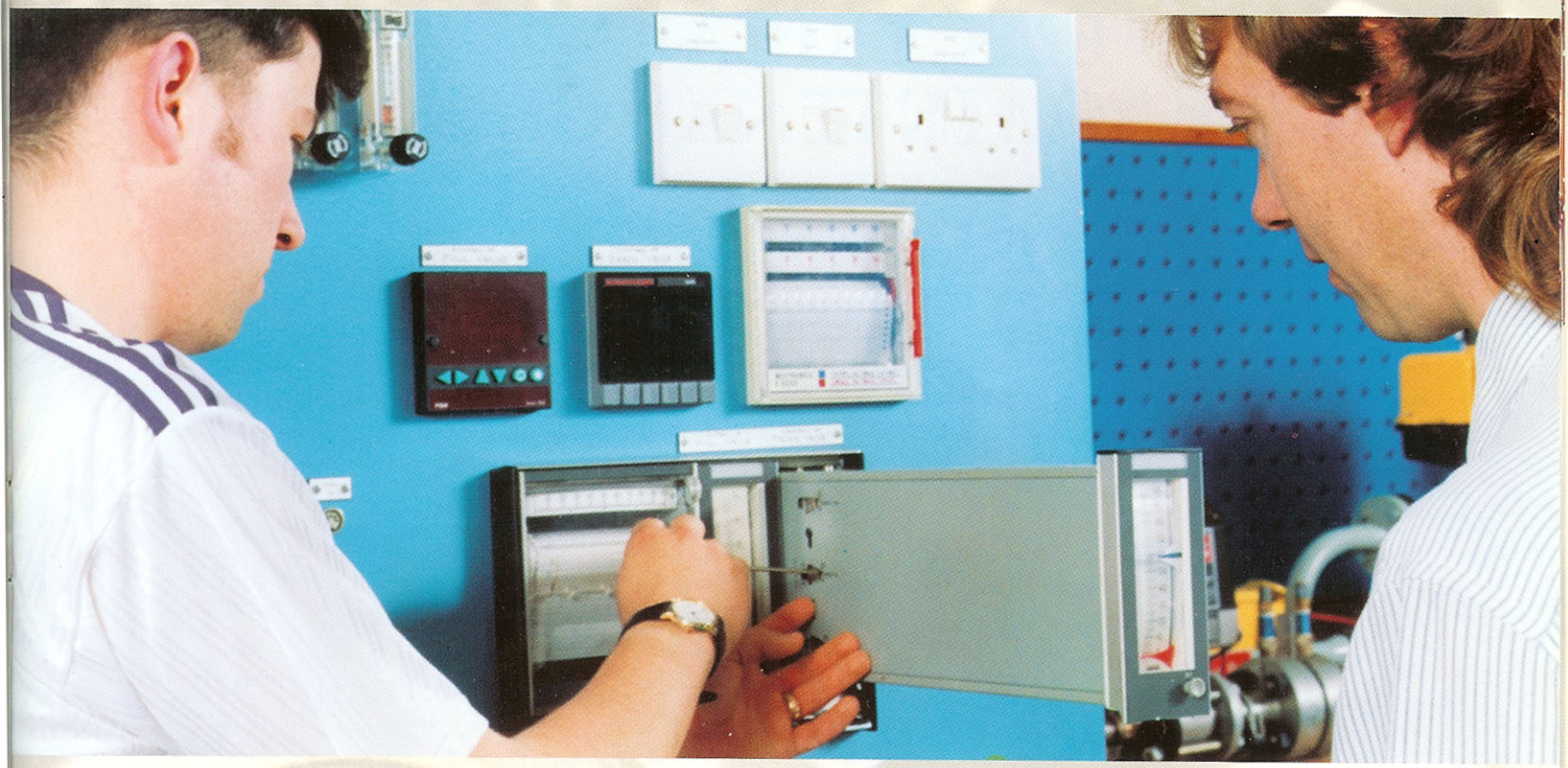
SAFE ENGINEERING - GOOD ENGINEERING

It is generally recognised that one of the most important considerations when implementing 'flexibility' or 'multi-skill' training is that of safety. Of course, all of our training is designed to emphasise safety - but we go much further. Those who are responsible for managing the work of employees, subsequent to training, need to be confident that the legal duty to ensure employee competency has been met - indeed, nowhere is this more the case than with electrical work where the statutory requirements are more stringent. In short, you will want the training your staff receive to be seen to be an integral part of your strategy for ensuring employee competence.

meeting the legal requirements

ENSURING COMPETENCE

The National College is recognised as the UK's foremost expert training provider in this respect - assisting engineering professionals to accurately assess and then, by means of appropriate training provision, meet the relevant statutory requirements for safety. This philosophy is reflected in everything we do - from assessing training needs to course design - from task analysis to on-site consolidation of training.



A PRACTICAL, COMMON-SENSE APPROACH

Time is money - so we ensure that the time you invest in training is spent as effectively as possible. Many people ask how it is possible, in a relatively short time, to gain the sort of skills that have traditionally been acquired by long apprenticeship.

■ Firstly, we ensure that the contents of courses are precisely focused - aimed directly at specific tasks - to enable people to deal effectively with real-life engineering or maintenance situations. It is of course crucial that the contents are relevant - we recognise the importance of avoiding unnecessary or irrelevant detail; for example, the sort of formal mathematics which has tended to persist in the curriculum simply by tradition. The emphasis throughout is on the teaching of useful, specific, practical skills supported by a sound understanding of fundamental principles.

■ Secondly, we believe strongly in the idea of 'learning by doing'. Our teaching methods are founded on this principle so you will find that all of our courses, wherever possible, have a substantial 'hands-on' component. Many of our courses utilise simulators and training aids designed specially by the College - so learning is accelerated by making the courses as practical as possible and closely related to actual industrial circumstances.

■ Thirdly, all of our teaching staff, in addition to being qualified trainers, are experienced engineers - drawn from industry and chosen specifically for the level of expertise they bring with them. Practical experience combined with enthusiasm for their subject enables them to impart useful, up-to-date skills in a down to earth and sympathetic manner.

ON-SITE CONSOLIDATION OF TRAINING

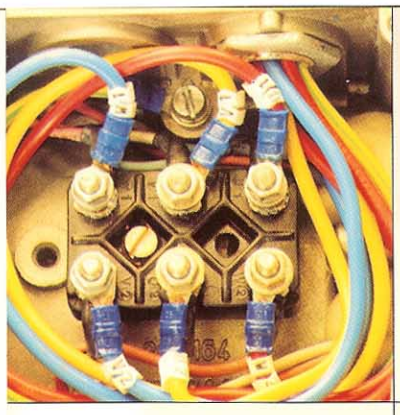
Your staff have had the training - but will it achieve the results your engineering department needs? Are your staff able to apply their new skills? - will supervisors know how to get the best from your newly trained workforce? It is at this stage that many 'flexible/multi-skill' initiatives flounder. Much of our success derives from our ability to offer a unique package of measures designed specifically to guide training through to on-site consolidation and ultimate implementation of the newly acquired skills - providing a service second to none in flexible/multi-skill training support. Measures which include:

■ Guidance on the on-site consolidation of training

■ Provision of documentation to facilitate on-site consolidation

■ Training support seminars for supervisors / line-managers

■ Expert advice on meeting the legal requirements for employee competency. We won't just sell you a course - with our expertise and determination you can be sure that your training programme will achieve the very best for your business.



ELECTRICAL MAINTENANCE SKILLS

This course is designed to provide basic electrical skills to those who wish to perform first-line electrical maintenance tasks - including the safe isolation, replacement, testing and commissioning of a wide range of electrical devices (motors, sensors, heating elements, solenoids etc.) - in a safe and effective manner. Importantly, the format of the course is specifically designed so that, when combined with suitable on-site consolidation of training (see section 'On-site consolidation'), it will assist the maintenance manager in meeting the legal requirements for employee competency in electrical work.

PARTICIPANTS

The structure and content of the course is aimed at those who currently fulfil a maintenance role, for example mechanical fitters. No prior electrical knowledge is assumed.

COURSE PRESENTATION

The course has an extensive 'hands on' component, placing the emphasis on safe working practice and on the development of useful, practical skills. Comprehensive course notes are provided for all participants.

COURSE OBJECTIVES

On completion of the course, participants will be able to

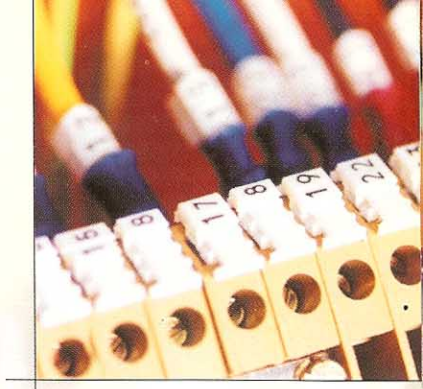
- practice safe working methods on electrical systems and understand the relevant regulative requirements
- demonstrate an understanding of electrical principles and units
- identify a wide range of electrical equipment & devices and understand their principles of operation / connections
- understand the principles of earthing / protection and associated protective devices
- demonstrate an understanding of electrical systems, switchgear and circuit types
- work with a range of cable types and carry out correct terminations and connections
- recognise a wide range of motor types and understand their operation, connections, and maintenance requirements
- use electrical test equipment effectively and carry out testing (insulation, continuity, tong, etc.) of a range of motors, solenoids, cables, etc.
- identify motor faults and correctly distinguish from power or control circuit faults
- read circuit diagrams and use them as an aid to maintenance / fault-finding procedures
- identify a range of motor starters, control gear and their connections, and understand precautions when resetting overloads etc.
- perform safe isolation, testing for dead, etc. on a wide range of devices and circuits, in a safe and secure manner.

COURSE 110

4 WEEKS
(2 X 2 WEEK MODULES)

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering Competence Certificate 110 'Electrical maintenance skills'

ELECTRICAL MAINTENANCE SKILLS
FOR INSTRUMENTATION PERSONNEL



The end objectives are identical to those of the Electrical maintenance skills (Course 110) but this course starts from the assumption of prior electrical knowledge of a level normally associated with instrumentation work. It is designed to provide basic electrical skills to those who wish to perform first-line electrical maintenance tasks - including the safe isolation, removal, testing and commissioning of a wide range of electrical devices (motors, sensors, heating elements, solenoids etc.) - in a safe and effective manner. Importantly, the format of the course is specifically designed so that, when combined with suitable on-site consolidation of training (see section 'On-site consolidation'), it will assist the maintenance manager in meeting the legal requirements for employee competency in electrical work.

PARTICIPANTS
The content of this course is aimed specifically at those who currently fulfil an instrumentation role. Since prior electrical knowledge is assumed it is important to note that basic electrical theory is not covered on this course.

COURSE PRESENTATION
This course places the emphasis on safe working practice and develops useful, practical skills by means of an extensive 'hands on' component. Comprehensive course notes are provided for all participants.

COURSE OBJECTIVES
On completion of the course, participants will be able to

- practice safe working methods on electrical systems and understand the relevant regulative requirements
- understand the principles of earthing / protection and associated protective devices
- demonstrate an understanding of electrical systems, switchgear and circuit types
- recognise a wide range of motor types and understand their operation, connections and maintenance requirements
- identify motor faults and correctly distinguish from power or control circuit faults
- identify a range of motor starters, control gear and their connections, and understand precautions when resetting overloads etc.
- perform safe isolation, testing for dead, etc. on a wide range of devices and circuits in a safe and secure manner.

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering Competence Certificate 120 'Electrical maintenance skills'

COURSE 120

2 WEEKS

ELECTRICAL SAFETY FOR PLUMBERS/GAS FITTERS

Plumbers and other mechanical service craftsmen often work on, or in close proximity to, electrical equipment and wiring as part of their normal duties. Bonding connections to pipe-work, immersion heaters, thermostats, etc. are all encountered regularly and personnel may have occasion to replace fuses, reset trips, or safely isolate circuits in order to carry out simple replacement / fault-finding activities. It is important, even with the performance of seemingly simple tasks, that the legal requirements for employee competency in electrical work are fulfiled - and this course is designed to provide participants with the necessary knowledge and safety awareness to carry out specified electrical tasks safely.

PARTICIPANTS

No prior electrical knowledge is assumed. The course is suitable for those non-electrical personnel who wish to be more aware of electrical safety when working on heating / hot water installations.

COURSE PRESENTATION

The course places the emphasis on safety and safe working practices. Practical experience is gained on a range of electrical devices representing those typically encountered by plumbers and gas fitters. Comprehensive course notes are provided for all participants.

COURSE OBJECTIVES

On completion of the course, participants will be able to

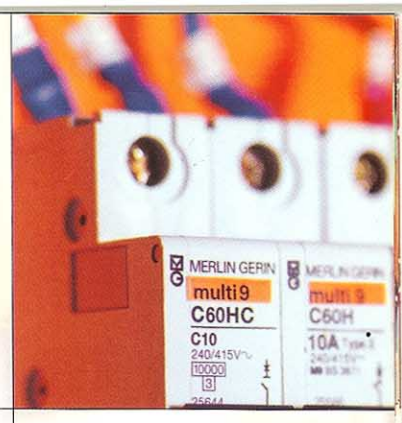
- practice safe working methods on domestic heating electrical systems and appreciate the relevant regulative requirements
- demonstrate an understanding of electrical principles and units
- identify a wide range of electrical equipment & devices and understand their principles of operation / connections (e.g. thermostats, valves, timers, programmers, boiler control/ignition)
- understand the principles of earthing /bonding/ protection, associated protective devices (fuses, MCBs RCDs), and requirements for safety when replacing/resetting
- demonstrate an understanding of domestic electrical circuit types
- carry out correct terminations and connections of flexible cables and be aware of current-carrying capacities
- use electrical test equipment effectively to test (insulation resistance, continuity) thermostats and heater elements
- perform safe isolation, testing for dead etc. on typical heating / hot water circuits and equipment in a safe and secure manner.

COURSE 130

3 DAYS

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering Competence Certificate 130 'Electrical safety for plumbers / gas fitters'

IEE WIRING REGULATIONS (BS 7671)



Traditionally recognised as necessary for all installation electricians, this course is increasingly regarded as essential for those who are involved in, or supervise, electrical work such as electrical maintenance, control or instrumentation. Current legal requirements for employee competence in electrical work now require that anyone involved in certain electrical activities - for example, simply choosing the size or type of cable or fuse - must be fully aware of the regulative requirements governing such work.

PARTICIPANTS

Ideal for all those involved in electrical work of any kind - participants should have an understanding of electrical principles together with an appreciation of electrical installation work practice.

COURSE PRESENTATION

The course is presented in a helpful and informative way, making frequent reference to typical electrical and electrical design problems and offering practical solutions. Students are loaned copies of the IEE Regulations and the IEE "On-site Guide" for use during the course - and are provided with a free copy of the AEEU book "Electricians' Guide to Good Electrical Practice".

COURSE OBJECTIVES

This course is designed to provide participants with:

1. a thorough understanding of the regulations
2. the ability to correctly use the regulations in the design, construction and maintenance of installations
3. the knowledge necessary to successfully sit the City & Guilds 2380 examination.

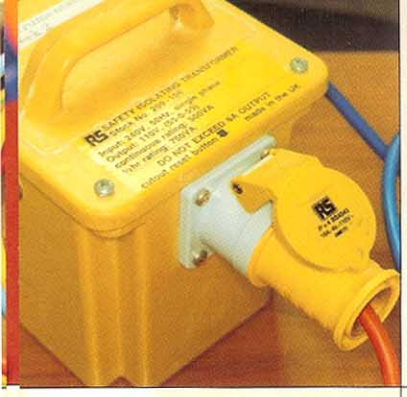
On completion of the course, participants will understand the regulative requirements regarding:

- the scope and object of the Regulations, and fundamental requirements for safety
- the definitions and terms used in the Regulations
- protection for safety
- selection and erection of equipment
- special installations or locations
- inspection and testing.

Successful completion of the course and examination leads to the award of: City & Guilds of London Certificate 2380

COURSE 310

3 DAYS/EVENINGS



ELECTRICITY AT WORK REGULATIONS

What makes a person legally competent to do electrical work? In what way is the requirement for competency in electrical work more stringent than for other types of work? Who is responsible for ensuring that electrical tasks at work are carried out correctly? When is it legally permissible to work live? These are just some of the questions dealt with on this informative course - essential for all electrical engineers, electricians, supervisors - indeed anyone who works with electricity.

PARTICIPANTS

This course is essential, and suitable, for anyone involved in any form of electrical work including those who are responsible for supervising the electrical work activities of others.

COURSE PRESENTATION

This important subject is illustrated throughout by reference to real-life situations and practical applications. Course documentation is provided for all participants.

COURSE OBJECTIVES

On completion of the course, participants will have a thorough understanding of the current legal requirements regarding

- the concept of 'duty holder'
- electrical systems, work activities and protective equipment
- the strength and capabilities of electrical equipment
- electrical equipment in adverse or hazardous environments
- the provision of insulation, barriers, etc.
- earthing, bonding and other means of protection
- the integrity of referenced conductors
- suitability of electrical connections
- protection from overload and short-circuit currents
- disconnection and isolation of circuits
- precautions for safe isolation
- working live
- working space, access and lighting
- the concept of 'competence' in electrical work.

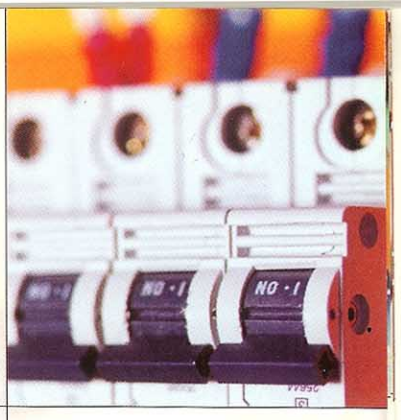
COURSE 330

1 DAY

Successful completion of the course leads to the award of: AEEU National College of Electrical & Mechanical Engineering Attendance Certificate 330 'Electricity at Work Regulations'

THE INSPECTION, TESTING AND CERTIFICATION OF ELECTRICAL INSTALLATIONS

(AEEU COMPETENCE CERTIFICATE 150)



With the testing and inspection of installations now enforceable by statutory regulation all those involved in electrical work are concerned to ensure that it is carried out effectively. Not only contracting electricians but anyone responsible for the maintenance of installations needs to be aware of how to comply with current legislation. This course is designed to meet this need and incorporates AEEU competence-based assessment and certification.

PARTICIPANTS

Prospective candidates should possess City & Guilds of London 2380 qualification in the current edition of BS 7671 (Institution of Electrical Engineers Wiring Regulations).

COURSE PRESENTATION

The emphasis throughout is on the practical application of testing and inspection procedures. Participants are able to carry out testing on purpose built training rigs using a wide range of test equipment. Full course documentation is provided.

COURSE OBJECTIVES

On completion of this course, participants will be able to

- understand the dangers associated with testing and the precautions necessary for the protection of personnel and equipment
- understand the statutory and non-statutory requirements for testing of electrical installations
- carry out visual / physical inspection of fixed electrical installations in accordance with the IEE Wiring Regulations BS 7671
- understand the requirements for periodic inspection and testing
- carry out appropriate electrical tests including the following;

  continuity of protective conductors
  continuity of ring final circuit conductors
  insulation resistance
  polarity
  earth fault loop impedance
  RCD testing

- determine appropriate test pass levels and interpret results correctly
- correctly complete relevant documentation to conclude testing / inspection procedures.

Successful completion of the course leads to the award of: AEEU National College of Electrical & Mechanical Engineering Competence Certificate 150 'Inspection, testing and certification of electrical installations'

COURSE 150

2 DAYS

THE INSPECTION, TESTING AND CERTIFICATION OF ELECTRICAL INSTALLATIONS (C&G 2391)

Aimed at electrical personnel who either carry out, or supervise, the testing and inspection of installations, this course is designed to meet the needs of those who require to sit the City & Guilds of London 2391 examination. The course is aimed at NICEIC requirements for Qualifying Manager status. Candidates for the C&G 2391 examination should note that each individual is required to attend for a pre-arranged half-day assessment.

PARTICIPANTS

Prospective candidates should possess City & Guilds of London 2380 qualification in the current edition of BS 7671 (Institution of Electrical Engineers Wiring Regulations).

COURSE PRESENTATION

The course is designed to prepare candidates for the C&G 2391 assessment. As with Course 150 the emphasis is on the practical application of testing and inspection procedures. Participants are able to carry out testing on purpose built training rigs using a wide range of test equipment. Full course documentation is provided.

COURSE OBJECTIVES

On completion of this course, participants will be able to

COURSE 150A

2 DAYS

- understand the dangers associated with testing and the precautions necessary for the protection of personnel and equipment
- understand the statutory and non-statutory requirements for testing of electrical installations
- carry out visual/physical inspection of fixed electrical installations in accordance with the IEE Wiring Regulations BS 7671
- understand the requirements for periodic inspection and testing
- carry out appropriate electrical tests including the following;

  continuity of protective conductors
  continuity of ring final circuit conductors
  insulation resistance
  polarity
  earth fault loop impedance
  RCD testing

ASSESSMENT 150B

1/2 DAY

- determine appropriate test pass levels and interpret results correctly
- correctly complete relevant documentation to conclude testing/inspection procedures.

Successful completion of the assessment leads to the award of: City & Guilds of London Certificate 2391

PORTABLE APPLIANCE TESTING

The relatively recent legal requirements for the testing of portable equipment affects all of us - wherever we work. This course provides participants with a thorough working knowledge of those legal requirements and the expertise to carry out such testing correctly and effectively.

PARTICIPANTS

Ideally suited for all those involved in either maintenance or contracting roles who wish to undertake the testing of portable equipment.

COURSE PRESENTATION

There is a high 'hands-on' content within the course with ample opportunity for participants to try their hand using a wide range of leading PAT testers. Course documentation is provided.

COURSE OBJECTIVES

On completion of the course participants will be able to

- understand the dangers associated with PAT testing and the precautions necessary both for safety - and for the protection of equipment
- determine the legal requirement for testing portable appliances
- assess the required frequency of testing
- understand the legal requirements for specific identification of equipment
- implement an audit of portable appliances within a company
- recognise the testing requirements for different classes of equipment
- carry out visual inspection of appliances and equipment
- carry out the following tests using a wide range of proprietary PAT testers;

  earth bond
  insulation resistance
  dielectric strength test
  load test
  earth leakage

- correctly interpret test results and determine appropriate pass levels
- create a system of record keeping which complies with the statutory requirements.

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering Competence Certificate 160 'Portable appliance testing'

COURSE 160

1 DAY

ELECTRICAL BUILDING SERVICES

This course is designed to provide the skills necessary to carry out first-line maintenance of electrical installations in hospitals, universities, office blocks, etc. It will enable maintenance or estates personnel to deal safely with a wide range of tasks on circuits and equipment of the sort normally associated with lighting, small power and heating systems. Importantly, when supported by suitable on-site consolidation of training (see section on AEEU On-site Consolidation) provision of this course will assist estates managers in meeting the legal requirements for employee competency in electrical work.

PARTICIPANTS

No prior electrical knowledge is required in order to benefit from this course. It is suitable for all non-electrical specialists in maintenance and estates departments.

COURSE PRESENTATION

The emphasis is very much on 'learning by doing' and the development of useful, practical skills - with particular stress being placed upon safety. Participants are provided with comprehensive course documentation.

COURSE OBJECTIVES

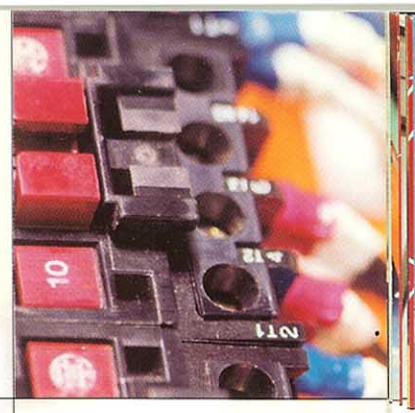
On completion of the course participants will be able to

- practice safe working methods on electrical installations and understand the relevant statutory requirements
- demonstrate an understanding of electrical principles and units
- understand the equipment, circuits and devices typically found in installations, and their principles of operation
- perform safe isolation, testing for dead, etc. in a safe and secure manner
- correctly remove and replace faulty electrical devices
- understand the principles of earthing /protection and associated protective devices
- safely reset overloads, replace fuses, etc.
- correctly terminate a range of cable types
- understand different motor types, their connections and typical faults
- use electrical test equipment to diagnose problems on circuits, motors and other devices
- read circuit diagrams and use them as an aid to fault-finding

COURSE 140

4 WEEKS (2 X 2 WEEK MODULES)

Successful completion of the course leads to the award of: AEEU National College of Electrical & Mechanical Engineering Competence Certificate 140 'Electrical building services'



HAZARDOUS AREAS

The designation of hazardous areas is common in many different sectors of industry. Those involved in the maintenance of electrical apparatus in potentially explosive atmospheres are legally required to have suitable and sufficient training on the special measures, equipment and working practices necessary to ensure safety. This course is designed to provide participants with the knowledge necessary to work safely in hazardous areas together with an appreciation of the appropriate regulative requirements.

PARTICIPANTS

Anyone involved in carrying out electrical work in hazardous areas, or supervising others in carrying out such work, will benefit from this course. No prior knowledge of explosion protection is required.

COURSE PRESENTATION

This informative course deals with practical issues in an informal way making full use of videos and providing plenty of opportunity for participants to raise their own questions. Participants are provided with useful reference documentation.

COURSE OBJECTIVES

On completion of this course participants will have a thorough understanding of the following:

- the definition of hazardous areas
- area classification
- apparatus grouping and temperature classification
- protection methods:

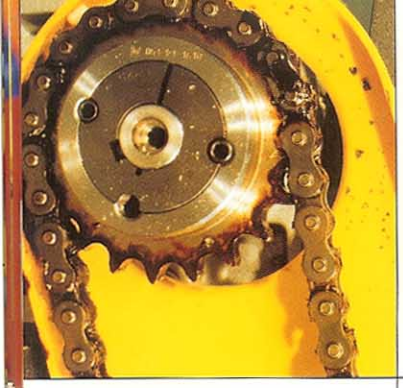
  eex d flameproof protection
  eex e increased safety
  eex i intrinsic safety
  ex N, p, m, o, q

- standards and certification - BS and European
- marking of equipment for hazardous areas
- inspection and testing
- safe isolation and testing for dead in hazardous areas

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering
Attendance Certificate 340 'Hazardous areas'

COURSE 340

1 DAY



MECHANICAL MAINTENANCE SKILLS

This course provides personnel with the skills necessary to perform first line mechanical maintenance including the identification and rectification of bearing faults, the dismantling and re-assembly of a wide range of mechanical assemblies / devices (including drive mechanisms, pumps, couplings, shafts, levers and linkages etc.)

PARTICIPANTS

Designed to benefit anyone required to undertake first line mechanical maintenance, this course is equally suitable for production operatives or for craft personnel (for example maintenance electricians) already involved in maintenance activities.

COURSE PRESENTATION

The course format is very much 'hands on' - the emphasis being on the development of sound practical skills within the context of safe working practice.

COURSE OBJECTIVES

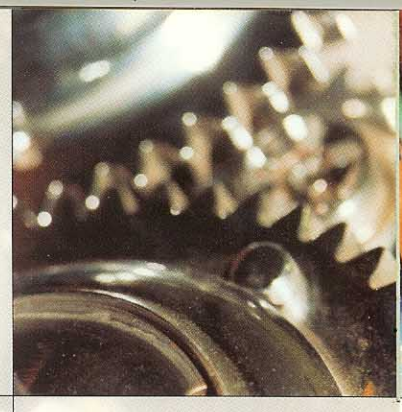
On completion of the course, participants will be able to

- apply safe working practices to first line mechanical maintenance
- correctly diagnose mechanical faults and plan a suitable course of maintenance action
- recognise bearing defects/faults
- correctly remove and replace bearings (plain bush, ball and roller)
- remove and refit taper-lock bushes
- correctly remove and replace seals, gaskets and gland packaging
- correctly use measuring and marking-out equipment (micrometer, vernier callipers/height gauges)
- make and replace worn/broken studs
- make and fit keys
- drill and ream parallel and tapered holes
- cut screw threads (internal/external)
- understand lubrication methods
- competently dismantle mechanical assemblies (pumps, gearboxes, conveyors etc.), examine parts for serviceability, replace defective components and re-assemble
- correctly align bearing shafts
- examine and test reassembled parts/assemblies/mechanisms to ensure correct function.

Successful completion of the course leads to the award of: AEEU National College of Electrical & Mechanical Engineering Competence Certificate 710 'Mechanical maintenance skills'

COURSE 710

2 WEEKS



ABRASIVE WHEELS

For those who work with abrasive wheels, appropriate training is absolutely essential for reasons of safety; indeed, it is a statutory requirement (Abrasive Wheels Regulations 1970, Regulation 9) that those involved in the mounting of wheels should first receive suitable and sufficient training. This course is designed specifically to meet this need.

PARTICIPANTS

This course is suitable for anyone who works with abrasive wheels but is indispensable for anyone involved in the checking, dressing or replacement of wheels. No prior knowledge is assumed.

COURSE PRESENTATION

The course is designed to provide participants with the sound practical skills they need in the workplace together with a thorough understanding of the relevant regulative requirements. Informative reference documentation is provided.

COURSE OBJECTIVES

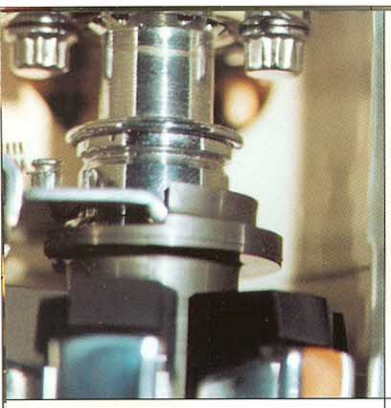
On completion of the course participants will have a thorough understanding of

- the hazards arising from the use of abrasive wheels and precautions which should be observed
- the Abrasive Wheel Regulations and HSE advisory literature
- methods of marking abrasive wheels as to type and speed
- correct storing, handling and transporting of abrasive wheels
- proper methods of inspecting and testing abrasive wheels
- how to determine when wheels need replacing
- the components used with abrasive wheels and their correct assembly
- the correct balancing of abrasive wheels
- the proper method of dressing wheels
- the correct adjustment of rests

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering Competence Certificate 720 'Abrasive wheels'

COURSE 720

1 DAY



CNC PROGRAMMING

With the ever-increasing use of CNC machine tools comes the need for appropriate CNC programming skills. This course is particularly suitable for those who either already possess milling or turning skills, and who wish to extend their expertise to cover CNC, or for machine operators who may benefit from gaining the skills required to program the machines they operate.

PARTICIPANTS

This course is ideal for anyone working with CNC lathes or milling machines but no knowledge of machining or CNC programming is assumed.

COURSE PRESENTATION

'Hands-on' experience and practical CNC programming skills are gained using FANUC CNC simulators. Participants receive comprehensive course documentation.

COURSE OBJECTIVES

On completion of the course participants will be able to

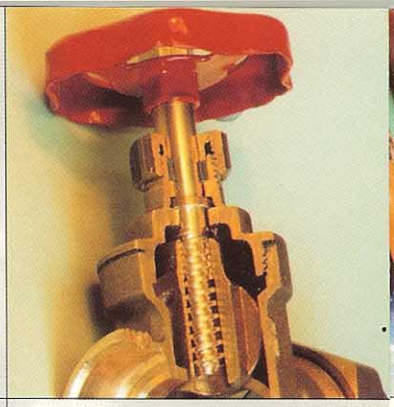
- access menus and select appropriate G-codes and M-codes
- correctly compile program sheets
- produce programming instructions from drawing information
- input appropriate surface speed, feed and depth of cut
- utilise suitable canned cycles
- program tool offset
- carry out absolute and incremental programming
- program sub-routines

COURSE 560

4 1/2 DAYS

Successful completion of the course leads to the award of: AEEU National College of Electrical & Mechanical Engineering Competence Certificate 560 'CNC programming'

MECHANICAL BUILDING SERVICES



Estates Departments responsible for the upkeep of the services of buildings used as office blocks, hospitals, universities etc., often seek to improve the department's overall effectiveness by extending the range of skills possessed by their maintenance personnel. This course is specifically designed to provide non-mechanical specialists with the skills needed to carry out first-line mechanical maintenance on low pressure hot water heating systems, hot and cold water services, and drainage systems - together with associated pipe-work, pumps, valves and other ancillary equipment.

PARTICIPANTS

Estates or maintenance personnel of all kinds will benefit from this course. No prior knowledge is assumed.

COURSE PRESENTATION

The emphasis throughout is on the practical application of skills necessary to deal effectively with first-line maintenance tasks. Course notes are provided.

COURSE OBJECTIVES

On completion of this course participants will be able to

- apply safe working practices and meet relevant regulative requirements when working with mechanical building services
- understand different types of LPHW system
- diagnose faults on LPHW systems
- carry out bending of copper tube
- correctly fabricate soldered pipe-work joints
- remove and replace radiators/radiator valves
- remove and replace taps
- dismantle thermostatic mixer units and replace defective parts
- correctly recharge pressure vessels
- make joints in PVC soil piping using either solvent or 'O' ring type joints
- remove and replace different types of bearings
- dismantle and reassemble shaft couplings
- dismantle and reassemble water pumps
- apply appropriate lubrication
- correctly repack valve gland stuffing boxes

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering Competence Certificate 740 'Mechanical building services'

COURSE 740

3 WEEKS

REFRIGERATION AND AIR-CONDITIONING

Anyone required to work with refrigeration or air-conditioning plant of any kind will find this course indispensable. All aspects of basic unit maintenance, servicing and commissioning are covered and the course also provides the skills necessary to install the pipe-work associated with small to medium sized systems.

PARTICIPANTS

The course is ideal for anyone with a maintenance or contracting background. No prior knowledge of refrigeration or air-conditioning is assumed.

COURSE PRESENTATION

The course is predominantly practical with participants having the opportunity to develop their skills on purpose-built refrigeration/air-con units. Comprehensive course documentation is provided.

COURSE OBJECTIVES

On completion of the course participants will be able to

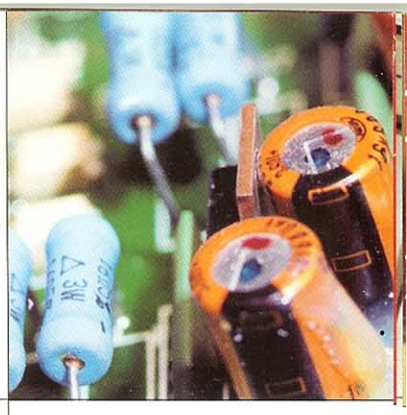
- recognise the component parts of refrigeration/air-con units and understand their function in refrigeration cycle
- produce an operational log of a refrigeration plant and use as an aid to fault-finding
- correctly use a gauge manifold, torr gauge and vacuum pump
- remove refrigerant from a system using a recovery unit
- evacuate a system correctly
- determine appropriate refrigerant types by pressure/temperature relationship, using data sheets and a comparator
- charge a system with refrigerant, by weight or by vapour
- safely charge the low pressure side of a system with liquid to facilitate the charging of blends
- set pressure control switches
- pressure test a system
- leak test a system using halide lamp, electronic leak detectors or soap solution
- form, braze and install pipe-work

COURSE 750

4 1/2 DAYS

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering Competence Certificate 750 'Refrigeration and air-conditioning'

MAINTENANCE OF ELECTRONIC EQUIPMENT



With industrial systems increasingly utilising electronic components and circuitry there is an ever-growing need for electrical maintenance personnel to be familiar with this technology. This course concentrates very much upon practical maintenance applications in the industrial environment - providing participants with the knowledge necessary to be capable of maintaining electronic equipment to component level thereby achieving considerable cost benefits within maintenance departments.

PARTICIPANTS

The course is designed for those who have an electrical background (for example maintenance electricians) who wish to extend their work into the field of electronics.

COURSE PRESENTATION

The course gives participants considerable practical experience of the types of electronic devices and circuitry typically found in industry. After covering the operation of some simple circuits, and some of the faults they typically develop, participants develop their testing / fault-finding skills on a range of industrial electronic devices and circuits. Comprehensive course notes are provided for all students.

COURSE OBJECTIVES

On completion of this course, participants will be able to

- apply suitable safety precautions when carrying out maintenance procedures
- understand the operation of various electronic components
- identify components in terms enabling replacements to be specified
- understand the function of components within circuits
- read electronic circuit diagrams
- correctly analyse electronic circuits using test equipment (oscilloscopes, logic probes etc.)
- apply a systematic approach to fault finding
- locate faulty components and carry out effective repairs.

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering
Competence Certificate 210 'Maintenance of electronic equipment'

COURSE 210

2 WEEKS

PC MAINTENANCE

The course provides the necessary core underpinning knowledge and hands-on experience to enable maintenance personnel to effectively upgrade and repair personal computers in industrial and office environments. The course also provides a thorough understanding of hardware conflicts and methods of overcoming 'boot-up' failures and will enable the engineer to specify system expansion to meet specific requirements.

PARTICIPANTS

Electricians, technicians and computer users alike will find the course indispensable for implementing engineering maintenance policy or for specifying upgrades and new systems.

COURSE PRESENTATION

The basic concepts are backed-up by course notes which are kept by course participants. All relevant topics are also backed-up by practical experience using actual micro computers and associated expansion cards and hardware.

COURSE OBJECTIVES

On completion of this course, participants will be able to

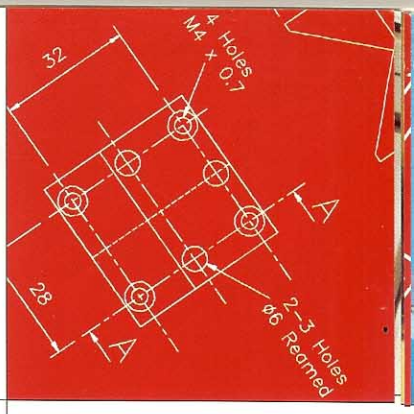
- understand the different performance benefits of the various microprocessors and motherboards
- understand computer memory concepts, optimise its use and perform expansion upgrades
- define the major bus types and their limitations
- modify systems to benefit from the advantages of SCSI interfaces
- identify video interface connections and match the specification with video driver cards
- define the various types of hard drive, their respective limitations and typical faults
- identify defective floppy drives and/or associated back-up media
- define other back-up systems and their limitations
- define the basic interfaces/ports and use them for expansion purposes
- perform a range of upgrades including CD ROM and sound cards
- solve hardware conflicts, identify BIOS limitations, identify faulty motherboards and expansion cards
- identify boot failures using a start-up disk and successfully install operating system software.

COURSE 410

$4\frac{1}{2}$ DAYS

Successful completion of the course leads to the award of: AEEU National College of Electrical & Mechanical Engineering Competence Certificate 410 'PC maintenance'

AUTOCAD: COMPUTER AIDED DESIGN



Virtually every sector of engineering, construction and manufacturing is now benefiting from the use of computer aided design (CAD) technology in the drawing office. This course is intended to provide participants with the skills necessary to use CAD effectively in their own particular discipline - whether in mechanical engineering, electrical, electronic, architectural, construction, etc.

PARTICIPANTS

No prior knowledge of drafting, CAD, or indeed any specific engineering knowledge is necessary. The course is suitable for anyone who wishes to use CAD in any kind of application.

COURSE PRESENTATION

The course is designed with the practical application of CAD very much in mind. Each participant uses an individual workstation and, in addition to developing the essential generic CAD skills, the course provides the opportunity to apply those skills in creating drawings in a discipline of the participant's choice. Course notes are provided.

COURSE OBJECTIVES

On completion of the course participants will be able to

- set up AutoCAD configuration to match given hardware
- set up drawing limits, size, grid, snap, cursor, scale, etc.
- access menus and select appropriate tools/commands for given applications
- use CAD 'layers' to structure drawings
- load and access libraries, and utilise symbols, etc. in drawings
- apply AutoCAD techniques in oblique, isometric and first/third angle projections
- correctly save and retrieve AutoCAD drawings

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering Competence Certificate 440 'AutoCAD: Computer aided design'

COURSE 440

$4^1/_2$ DAYS

INTRODUCTION TO
PERSONAL COMPUTERS AND 'WINDOWS'

The increasing use of computers in the workplace means that more and more people are being required to take on the skills necessary to use computers in an effective way. This course provides an ideal first step towards becoming 'computer-literate'.

PARTICIPANTS

The course is suitable for anyone who wishes to use personal computers in any application. No prior knowledge or experience of using a computer is necessary.

COURSE PRESENTATION

This introductory course is structured to allow participants to 'learn by doing' - applying their skills to practical tasks using 'Windows' on IBM-compatible PCs. Course notes are provided.

COURSE OBJECTIVES

On completion of this course participants will be able to

- power-up, start, access shutdown and exit the PC correctly
- create, edit copy, move, print, save and delete files
- format floppy discs
- clean and maintain the PC, keyboard and mouse
- understand the relevant regulative requirements

COURSE 420

1 DAY

Successful completion of the course leads to the award of: AEEU National College of Electrical & Mechanical Engineering Competence Certificate 420 'Introduction to personal computers and Windows'

USING WORD-PROCESSORS AND SPREADSHEETS

This course provides a comprehensive introduction to the use of Microsoft Word and Microsoft Excel software.

PARTICIPANTS

Those attending should preferably have some experience of 'Windows'; the course is intended as a follow-up to Course 420 'Introduction to personal computers and Windows'.

COURSE PRESENTATION

The course is structured to allow participants to 'learn by doing' - applying their skills to practical tasks using Microsoft Word and Microsoft Excel on IBM-compatible PCs. Course notes are provided.

COURSE OBJECTIVES

On completion of this course participants will be able to

- use Microsoft Word to create and edit letters, memos, etc.
- use Microsoft Excel to create and edit spreadsheets
- create graphs from data held in a spreadsheet
- print hard copies of the above, and arrange page layout
- check work for errors

Successful completion of the course leads to the award of: AEEU National College of Electrical & Mechanical Engineering Competence Certificate 430 'Using word processors and spreadsheets'

COURSE 430

1 DAY

INSTRUMENTATION

Designed to enable maintenance personnel to carry out commissioning, calibration and maintenance, this course covers the key aspects of current instrumentation and process control technology.

PARTICIPANTS

The course is ideal for those who presently possess some electrical knowledge, work in a maintenance environment and seek to expand their activities to include process control and instrumentation systems.

COURSE PRESENTATION

The course is extensively 'hands on', giving participants considerable practical experience of the devices typically found in industry. Comprehensive course notes are provided.

COURSE OBJECTIVES

On completion of this course, participants will be able to

- understand the health and safety implications of working with process control systems
- appreciate the operation of typical instrumentation systems
- identify the various methods of signal transmission
- correctly connect electrical or air-powered devices
- understand the equipment used in;

    1. temperature measurement
       (RTDs, thermocouples, etc.)
    2. pressure measurement
       (air / electrical differential pressure cells)
    3. level measurement
       (bubblers, pressure cells, ultrasonic, load cells)
    4. flow measurement
       (orifice plates, mag-flow meters, weirs, flumes, etc.)

and demonstrate an ability to correctly connect, commission and maintain these devices and their associated wiring

- understand the principles of turbidity, density, pH, proximity and weight measurement and apply relevant maintenance procedures required by each
- commission and calibrate I to P converters, chart recorders and process meters

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering Competence Certificate 510 'Instrumentation'

COURSE 510

4 1/2 DAYS

THREE-TERM CONTROLLERS

Three-term controllers continue to play an important role in many industrial processes and this course is designed to provide the skills and understanding necessary to effectively maintain control systems which utilise this technology. The course is ideal for those who have attended Course 510 'Instrumentation' and who wish to further enhance their instrumentation skills.

PARTICIPANTS

Those attending the course should preferably have an understanding of the input/output devices typically used in process control systems. No prior knowledge of electronic controllers is required.

COURSE PRESENTATION

An extensively 'hands-on' approach is used throughout, with participants gaining substantial practical experience in the configuring, calibrating and tuning of a range of industry-standard controllers. Participants are provided with course documentation.

COURSE OBJECTIVES

On completion of the course participants will be able to

- understand the safety implications of working on closed-loop control systems
- understand the relevance of the three terms (PID) used in controllers
- identify the capabilities of controllers from their exterior markings
- correctly and safely configure and calibrate a range of industry standard electronic controllers
- manually tune electronic controllers
- appreciate the limitations of 'auto-tuning'
- determine when a controller is correctly tuned

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering Competence Certificate 550 'Three-term controllers'

COURSE 550

2 DAYS

INTRODUCTION TO PROGRAMMABLE LOGIC CONTROL (PLC)

Programmable logic control systems are used increasingly in all areas of industry. Accordingly, it becomes ever-more important that maintenance personnel should be familiar with the technology that lies at the heart of many modern industrial processes. The course is invaluable for anyone who is involved in maintenance tasks on systems or equipment controlled by PLC. It aims to develop an understanding of the PLC and its role in the control of industrial plant.

PARTICIPANTS

The course is suitable for anyone in a maintenance role. Participants should ideally have an understanding of electrical principles.

COURSE PRESENTATION

The emphasis throughout is on useful, practical skills and their application in the context of common industrial situations. Much of the course is given over to 'hands-on' experience of PLCs and their practical applications. Participants are provided with comprehensive course documentation.

COURSE OBJECTIVES

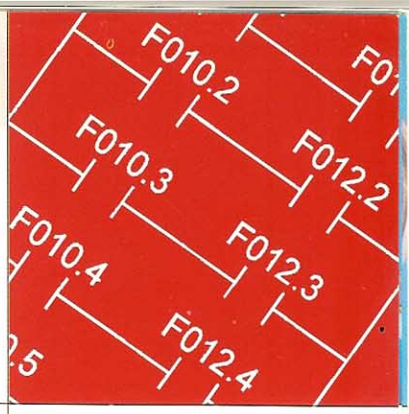
On completion of the course participants will be able to

- understand the safety issues involved with PLCs and appreciate the need for safe working practices
- understand how PLCs are incorporated into modern industrial control systems, and the typical applications they are put to
- understand the logic functions performed by basic PLC instructions
- understand the methods of addressing used on PLCs
- identify the various forms of I/O modules
- understand the various methods of transmitting signals to and from PLCs
- understand the use of battery backup and ROM
- interpret ladder diagrams and statement lists
- use hand-held programmers and personal computers to interrogate PLCs
- monitor I/O lines to determine correct operation
- modify program parameters to solve process problems
- carry out fault-finding on PLC control systems
- backup a PLC program and restore it back to the PLC

COURSE 520

3 DAYS

Successful completion of the course leads to the award of: AEEU National College of Electrical & Mechanical Engineering Competence Certificate 520 'Introduction to programmable logic control'



PLC PROGRAMMING

As more and more use is made of PLCs in industry, maintenance personnel are increasingly required to make small changes to PLC programs - to adjust parameters, or modify programs to reflect changes in plant or processes. This course is designed to supplement Course 520 'Introduction to programmable logic control' and will provide participants with a sound, practical understanding of PLC programming techniques.

PARTICIPANTS

Those attending this course should have a good understanding of basic PLC operation such as is provided by Course 520.

COURSE PRESENTATION

Participants will have extensive access to PLCs and industrial process simulators and benefit throughout from a 'hands-on' approach to learning. Course documentation is provided.

COURSE OBJECTIVES

On completion of the course participants will be able to

- understand the potential health and safety issues involved in making program changes
- apply 'fail-safe' techniques in programming
- safely carry out modifications to PLC programs
- input PLC instructions in both 'ladder logic' and 'statement language' format
- structure programs using 'sub-routines'
- design programs to meet specified industrial process needs
- understand the use of D/A and A/D conversions for variable sensors and control
- use I/O 'forces' as an aid to fault-finding on plant control systems
- test PLC programs for correct operation

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering Competence Certificate 530 'PLC Programming'

COURSE 530

$1\frac{1}{2}$ DAYS

VARIABLE SPEED MOTOR DRIVES

Manufacturers of electronic drives report that of the units returned to them as 'faulty' up to 80% fail to reveal any faults - presumably the result of incorrect programming / fault diagnosis by maintenance personnel. This comprehensive course is designed to counter such difficulties by enabling the maintenance engineer to correctly set up, maintain and carry out effective fault-finding / trouble-shooting on a wide range of drive systems. Unlike some product-specific courses, this course is substantially generic - effectively covering most of the variable speed drive systems found in industry today and providing a thorough understanding of drive operation within the context of industrial systems. The following drive types are covered:

DC converter • AC inverter • Switched reluctance • Eddy current coupled

PARTICIPANTS

Suitable for anyone who is required to maintain or programme electronic drives (electricians, instrument technicians, etc.) Whilst a knowledge of basic electrical principles is desirable, no prior knowledge of motor theory or electronics is necessary.

COURSE PRESENTATION

The practicalities of programming, fault-finding and maintenance are demonstrated and then practised by participants on purpose built training rigs allowing considerable experience to be gained on a representative range of proprietary drive systems. The course is supported by detailed documentation which is provided to all participants.

COURSE 540

3 1/2 DAYS

COURSE OBJECTIVES

On completion of the course, participants will be able to

- apply safe working practices when working with variable speed drives
- demonstrate an understanding of the principles of operation of a range of electronic drive systems
- correctly programme, operate and monitor drive systems
- identify and correct programme errors
- differentiate between drive faults, motor faults and power faults
- differentiate between control / power circuit drive faults
- appreciate the concepts of fieldbus communications and SCADA systems.

Successful completion of the course leads to the award of: AEEU National College of Electrical and Mechanical Engineering Competence Certificate 540 'Variable speed motor drives'

FIBRE OPTICS

Designed to provide maintenance personnel with the knowledge and skills necessary to carry out installation, commissioning and fault finding on simple fibre optic, data communication links.

PARTICIPANTS

The course is intended for anybody working in a maintenance role, who seeks to expand their activities to include fibre optic systems. No prior knowledge or skills are required.

COURSE PRESENTATION

The course is extensively 'hands-on' giving participants considerable practical experience of the various cables, connectors and test equipment used in industry. Comprehensive course notes are provided.

COURSE OBJECTIVES

On completion of the course, participants will be able to

- apply safe working practices when working with fibre optic systems
- recognise the most common types of fibre and connectors used in industry
- understand the operation of the components used in a typical fibre optics system
- correctly connect fibre optic terminations
- correctly fabricate fibre optic mechanical splices
- appreciate how fusion splices are made and tested
- use a light source, power meter and microscope to evaluate the effectiveness of a fibre termination
- understand how an optical time domain reflectometer would be used.

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering Competence Certificate 810 'Fibre optics'

COURSE 810

2 DAYS

HYDRAULICS

PARTICIPANTS

This course is suitable for anyone who wishes to work on or maintain industrial hydraulic systems. No prior knowledge of hydraulics is necessary.

COURSE PRESENTATION

Participants gain useful practical experience on purpose-built training rigs which make use of typical commercial components and are designed specifically to simulate the hydraulic systems found in industry. Relevant course documentation is provided for all participants.

COURSE OBJECTIVES

On completion of the course participants will be able to

- apply safe working practices when working with hydraulic systems
- demonstrate relevant underpinning knowledge (*units, flow, pressure, temperature, forces, etc.*)
- understand the operation of hydraulic circuits and components typically used in industry
- carry out correct maintenance procedures on: power units (*fixed and variable delivery pumps, reservoirs, filters, strainers, pressure and vacuum gauges*), control elements (*directional control valves, manifolds, sequence, counterbalance, check and flow control valves*), and actuators (*cylinders, rams and motors*)
- use hydraulic test equipment to determine the nature and position of faults
- identify and rectify faults on cylinders and valves
- assess the condition of an hydraulic system by oil analysis
- use hydraulic circuit drawings and fault-finding charts as a systematic aid to fault-finding.

COURSE 610

$3\frac{1}{2}$ DAYS

Successful completion of the course leads to the award of; AEEU National College of Electrical & Mechanical Engineering Competence Certificate 610 'Hydraulics'

PNEUMATICS / ELECTRO-PNEUMATICS

This course will provide maintenance personnel, production operators, etc., with the skills and knowledge necessary to carry out first-line maintenance tasks on pneumatic and electro-pneumatic systems.

PARTICIPANTS

Suitable for anyone who is required to maintain industrial pneumatic systems. No prior knowledge of pneumatics or electrical principles is necessary.

COURSE PRESENTATION

A practical approach is taken throughout this course with participants gaining valuable 'hands-on' experience on purpose built rigs designed to simulate industrial systems. Comprehensive course documentation is provided.

COURSE OBJECTIVES

On completion of the course participants will be able to

- understand the need for safe isolation and be able to apply safe working practices when working with pneumatic / electro-pneumatic systems
- demonstrate relevant underpinning knowledge (*units, pressure, forces, etc.*)
- identify, inspect and adjust/replace/repair the following components: service units (*filter regulator lubrication*), sensors (*pneumatics valves and electrical switches, proximity sensors, and switches*), valves (*air and solenoid operated valves, sequence valves, directional control valves*), actuators (*cylinders and rotary actuators*), AND/OR elements, relays, timers, flow controls and quick exhausts
- use visual indicators and manual over-rides to check operation of components
- carry out repairs to pneumatic systems, replace fittings, plastic pipe-work, etc.
- use pneumatic circuit drawings as an aid to systematic fault-finding.

Successful completion of the course leads to the award of:
AEEU National College of Electrical & Mechanical Engineering Competence Certificate 660 'Pneumatics / Electro-pneumatics'

COURSE 660

$4^1/_2$ DAYS

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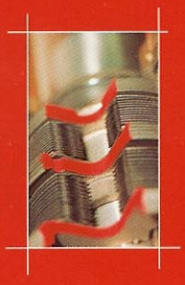
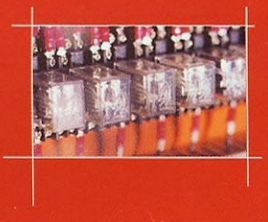
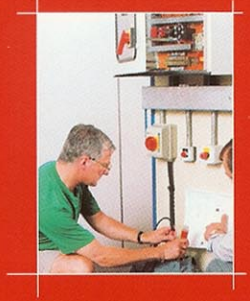


Safe use of electrical equipment on film & TV locations
Turning
Fork-lift truck training
Heating control systems
Drawing appreciation
Water bye-laws
Abrasive wheel Regulations
Oxy-acetylene welding
Instructional techniques
Motor control
NVQ Assessor training
Milling
Sheet-metal work
Machining practice
Cutter grinding
CNC machining
IEE Recommendations for Offshore Installations
MIG/TIG welding
Fitting
Earthing; legal & design implications



...*and* PROFESSIONAL ADVICE *on*

Skills Audits
Task Analysis
Legislative & Regulative Requirements
Electrical safety
European Legislation
Training accreditation
On-site consolidation of training



The National College of Electrical & Mechanical Engineering reserves the right to change the contents of courses at any time.

WHAT BUSINESSES HAVE TO SAY

about *The National College of Electrical & Mechanical Engineering*

"...excellent all-round 'Skill Enhancement' and 'Flexible Skills' training"

SHARWOOD & CO. LTD.

"...very much appreciate the friendly and helpful attitude...which assisted in the smooth implementation of our training initiative."

THE WELLCOME FOUNDATION LTD.

"The programme achieved all of our objectives...we were more than satisfied with the quality of the training...an added benefit was that many of the courses were approved to lead to further qualifications."

KELLOGGS

"...extremely helpful in ensuring that our training needs are matched to the appropriate courses and at the right level."

ZENECA

" ... engineers have found the course tutors informative, communicative and helpful - allowing the mixed range of abilities on each course to understand and complete their training."

CHAMPION AUTOMOTIVE

"The courses presented at our site were of excellent quality, professionally delivered and designed to bring real benefits"

DUNLOP

If you want to know more about how we can help your business, we will be pleased to hear from you -

THE NATIONAL COLLEGE OF ELECTRICAL & MECHANICAL ENGINEERING

CUDHAM HALL, CUDHAM
SEVENOAKS
KENT
TN14 7QB
Tel: 01959 571888 Fax: 01959 576830