ENGINEERING SKILLS TRAINING CENTRE (ESTC)

Prospectus 2014
Table of Contents

1. About us .............................................................................................................................................. 3
2. Accreditations and certificates ........................................................................................................... 3
3. Vision/Mission ...................................................................................................................................... 3
4. OSD Strategy ....................................................................................................................................... 3
   4.1 Strategy ........................................................................................................................................ 3
   4.2 HRD Governance .......................................................................................................................... 4
   4.3 Standards and procedures ............................................................................................................. 4
   4.4 Quality assurance and auditing ................................................................................................. 4
   4.5 Learning material development ................................................................................................. 4
   4.6 Learning from Incidents .............................................................................................................. 5
5. Learnerhips and Skills Programmes ................................................................................................ 6
   5.1 Learnerships/ Qualifications ..................................................................................................... 7
   5.2 Skills Programmes ....................................................................................................................... 7
   5.3 Learnership/ Skills Programme Training Schedule for 2014 ..................................................... 8
6. Specialized short courses .................................................................................................................. 10
7. Diesel Mechanic short courses .......................................................................................................... 17
8. Fitting & Turning short courses ......................................................................................................... 19
9. Plater Boilermaker/Welder short courses ....................................................................................... 27
10. Electrical short courses .................................................................................................................. 30
11. Instrumentation & Electronics short courses .............................................................................. 34
12. Rigging Ropesman short courses .................................................................................................. 38
13. General terms & conditions of service ......................................................................................... 41
14. General payment terms & conditions ............................................................................................. 41
ANGLO AMERICAN PLATINUM LIMITED

Engineering Skills Training Centre (ESTC)

1. ABOUT US

The Engineering Skills Training Centre (ESTC) was established in 1984 and is situated in Randfontein. The growing demand for qualified artisans in the industry prompted ESTC to open its training facility to the private sector and individuals with the relevant entry level qualifications.

The centre provides engineering skills training for engineering employees, including Stope Servicemen, Learnerships, Apprenticeships, Artisan Short Courses, Foremen Development, Planned Maintenance and various specialised short courses.

ESTC’s commitment to safety and quality training is demonstrated by its nationally accepted accreditations and to the upliftment and education of our country’s people.

2. ACCREDITATIONS AND CERTIFICATION

- Accredited training provider for the Mining Qualifications Authority (MQA)
- Programme approval with Manufacturing Engineering Sector Training Authority (MerSeta)
- Decentralised Trade Test Centre
- Institute Of Sectoral and Occupational Excellence (ISOE)
- ISO 9001:2008 certified
- Lexis & Nexis Safety Certification

3. VISION/MISSION

Vision: To become the leading Provider of Engineering Skills training in our region

Mission: ESTC is committed to consistently provide and improve quality learning delivery within the engineering fraternity We are committed to achieve zero harm through effective management of safety in all our disciplines

4. OSD STRATEGY

The Engineering Skills Training Centre (ESTC), as part of the Human Resource Development (HRD) and Transformation function, has been mandated by EXCO to provide a particular HRD service within the Platinum Division, as set out in the Company’s operating model. This is done for the following disciplines:

- Engineering
There are 6 main focus areas, they are:

4.1. **Strategy**

We provide a framework for skills development throughout the Platinum division to ensure compliance with:
- legislation and regulations
- industry requirements and
- Company strategic objectives including the Integrated Development Strategy and Culture transformation.
- We focus on driving performance through measuring, analysing and improving our service.

4.2. **HRD Governance**

We influence industry policy and its implementation through active participation on various external bodies such as those established by the MQA.

ESTC:
- Develop Group policies and procedures and
- Communicate national and industry developments impacting on learning delivery

4.3. **Standards and procedures**

ESTC develop clear standards and procedures which complement the ESTC Governance policy. Gaps in the relevant areas are identified and addressed to ensure that the Learning Delivery sites will continue to be examples of best practise.

4.4. **Quality assurance and auditing**

ESTC provides an integrated internal auditing service to assist sites to maintain both their ISO 9001:2008 listing as well as their Accredited Provider status. This service is based on clearly defined criteria as set out in relevant legislation and industry specific requirements. ESTC acknowledges that auditing must take place against site specific policies and procedures.

ESTC strives to identify areas of best practise in order to continually improve our Learning Delivery systems.

In addition, ESTC provides External Assessment and Moderation of national learnerships. This control mechanism ensures that learners who complete their qualifications are able to meet production demands.

4.5. **Learning material development**

ESTC integrates the threads of “Safe Profitable Platinum” into Group learning material. This is done through researching best practice in order to develop standardised, nationally compliant learning material (to include all learning from incidents).

This material is in line with requirements as set out in the
- various national qualifications and Skills programmes
- The Anglo American Platinum job catalogue.

Gap closure initiatives are implemented in order to confirm the validity of current material or effect revisions where appropriate. New material is developed where necessary.

*This is done for the following disciplines – Mining Conventional, Mining mechanised and Engineering.*
4.6. **Learning From Incidents (LFI)**

ESTC is actively involved in the communication of all LFI incidents. The management of change process includes:

- a risk assessment
- validation of standards and procedures
- drafting standards where necessary
- revising learning material where applicable and
- Updating learning delivery practices of training, assessment and moderation.
5. LEARNERHIPS AND SKILLS PROGRAMMES
ESTC ENGINEERING TRAINING SERVICES

5.1 Learnerships/ Qualifications:

Entry Requirements:
- Grade 12 with at least 40% in English, Mathematics and Physical Science;
- N2 with four (4) Subjects relevant to the trade.
- NCV 3 with at least 40% in Mathematics (not Mathematics Literacy) and all other subjects.

Successful candidates will take part in a Learnership programme leading to a selected Qualification and qualified Artisan.

The following Learnership programmes are offered:

- Automotive Electrician
- National Certificate: Electrical L4
- National Certificate: Millwright L4
- National Certificate: Instrument Mechanician L4
- National Certificate: Plater/Welder L3
- National Certificate: Fitting & Turning L3
- National Certificate: Fitting (Including Machining) L3
- National Certificate: Plater/Boilermaker L3
- National Certificate: Diesel Mechanic L3
- National Certificate: Rigger Ropesman L3
- National Certificate: Mechanical Engineering L2
- National Certificate: Engineering Fabrication L2
- National Certificate: Electrical Engineering L2
- Engineering Hard Rock Metalliferous – Stoping and Developing Level 2 (NQF Level 2)

5.2 Skills Programmes:

MQA Artisan Aide Level 2 – All disciplines (Skills Programme)

Entry Requirements:
- Candidates embarking on learning towards this skills programme have ABET 4/NQF Level 1 or Grade 9 with English and mathematics or equivalent.
- Learners must have knowledge and understanding of Hazard and Risk assessment as prescribed by the MHSA

This MQA Accredited skills programme may be the ideal platform for obtaining credits towards the National Certificate in Engineering (NQF Level 2) and other engineering apprenticeship qualifications or related sub-fields.

The following Skills Programmes are offered at ESTC:

- Fitting including Machining – MQA/SP/0140/13
- Diesel Mechanic - MQA/SP/0141/13
- Plater/ Welder - MQA/SP/0142/13
- Measurement Control & Instrumentation - MQA/SP/0143/13
- Rigger Ropesman - MQA/SP/0144/13
- Electrical - MQA/SP/0145/13
### 5.3 Learnership/ Skills Programme Training Schedule for 2014

#### OLD TRAINING WAY

<table>
<thead>
<tr>
<th>Training Phase</th>
<th>Duration</th>
<th>Trimester 1</th>
<th>Trimester 2</th>
<th>Trimester 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stoping &amp; Developing L 2</td>
<td>90 Days</td>
<td>06 Jan – 09 May 2014</td>
<td>05 May – 05 Sep 2014</td>
<td>04 Aug – 05 Dec 2014</td>
</tr>
<tr>
<td>MQA Artisan Aide L 2</td>
<td>90 Days</td>
<td></td>
<td>On Request and Approval only!</td>
<td></td>
</tr>
</tbody>
</table>

#### NEW TRAINING WAY

<table>
<thead>
<tr>
<th>Training Phase</th>
<th>Duration</th>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Training</td>
<td>115 Days</td>
<td>06 Jan – 13 June 2014</td>
<td>30 June – 05 Dec 2014</td>
</tr>
<tr>
<td>Advanced Training</td>
<td>100 Days</td>
<td>06 Jan – 23 May 2014</td>
<td>30 June – 14 Nov 2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 Feb – 04 Apr 2014</td>
<td></td>
</tr>
</tbody>
</table>
## ENGINEERING TRADES

<table>
<thead>
<tr>
<th>ELECTRICAL</th>
<th>MC &amp; I</th>
<th>RIGGING</th>
<th>DIESEL MECHANIC</th>
<th>PLATING/BOILERMAKING</th>
<th>FITTING</th>
<th>AUTOMOTIVE ELECTRICIAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Baseline Risk Assessment</td>
<td>• Baseline Risk Assessment</td>
<td>• Baseline Risk Assessment</td>
<td>• Baseline Risk Assessment</td>
<td>• Baseline Risk Assessment</td>
<td>• Baseline Risk Assessment</td>
<td>• Baseline Risk Assessment</td>
</tr>
<tr>
<td>• Basic Electricity</td>
<td>• Pressure</td>
<td>• Rigging Skills</td>
<td>• Introduction to basic Diesel</td>
<td>• Oxy-Acetylene cutting &amp; welding</td>
<td>• Stators</td>
<td>• Stators</td>
</tr>
<tr>
<td>• Motor Theory</td>
<td>• Flow</td>
<td>• Identify and use various types of ropes</td>
<td>• Transmission of gearboxes</td>
<td>• Grinding and tempering</td>
<td>• Alternators</td>
<td>• Alternators</td>
</tr>
<tr>
<td>• Domestic &amp; Panel wiring</td>
<td>• Level</td>
<td>• Splicing</td>
<td>• Wheel alignment</td>
<td>• Arc welding</td>
<td>• Batteries</td>
<td>• Batteries</td>
</tr>
<tr>
<td>• Single &amp; three phase circuits</td>
<td>• Temperature</td>
<td>• Inspection of ropes and equipment</td>
<td>• Diesel maintenance</td>
<td>• Plate forming</td>
<td>• Electrical wiring</td>
<td>• Electrical wiring</td>
</tr>
<tr>
<td>• Transformers</td>
<td>• 2 &amp; 3 term controllers</td>
<td>• Prepare hoist rope test specimen</td>
<td>• Pneumatics</td>
<td>• Pipe developing &amp; fabrication</td>
<td>• Generators</td>
<td>• Generators</td>
</tr>
<tr>
<td>• Cables</td>
<td>• Electronics</td>
<td>• Inspect a safety detachment hook</td>
<td>• Hydraulics</td>
<td>• Contour marking</td>
<td>• Solenoids</td>
<td>• Solenoids</td>
</tr>
<tr>
<td>• Fault finding</td>
<td>• Plc’s</td>
<td>• Erect a temporary platform/scaffold</td>
<td>• MIG &amp; TIG welding</td>
<td>• MIG &amp; TIG welding</td>
<td>• Plc’s</td>
<td>• Plc’s</td>
</tr>
<tr>
<td>• Motor starters</td>
<td>• Networking</td>
<td>• Lift and move loads using various methods and equipment</td>
<td></td>
<td></td>
<td>• Auto Electrical circuits</td>
<td></td>
</tr>
<tr>
<td>• DC Machines</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Armatures</td>
<td></td>
</tr>
<tr>
<td>• Electronics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Rectifiers</td>
<td></td>
</tr>
<tr>
<td>• Installation Tests</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Rotors</td>
<td></td>
</tr>
<tr>
<td>• Energy Meters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Regulators</td>
<td></td>
</tr>
<tr>
<td>• Plc’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Electrical Protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Medium Voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Medium Voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Anglo American Platinum – Engineering Skills Training Centre (ESTC)

Printed: 13-Dec-3         HRD_ESTC_ADM_FRM_012 Prospectus Rev 1         Revision date: 24-Oct-2014
6. SPECIALIZED SHORT COURSES

SPECIALISED SHORT COURSES
<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal Knowledge Coaching Foreman (Part A)</td>
<td>EIT Programme Trade Certificate</td>
<td>• Artisans • Foremen • Junior Engineers</td>
<td>4 Days</td>
<td>Prepare candidates for Mine Health and Safety Act Exam</td>
<td>• Interpret and understand Duties imposed by Mine Health and Safety Act - Part A.</td>
<td>ADC 08,15,22/02, 01/03/2014 19,26/07, 02,16/08/2014 This is done on Saturdays Edupark 10-13/02/2014 21-24/07/2014</td>
</tr>
<tr>
<td>Engineering Standards Coaching Foreman (Part B)</td>
<td>EIT Programme Trade Certificate</td>
<td>• Artisans • Foremen • Junior Engineers</td>
<td>4 Days</td>
<td>Prepare candidates for Mine Standard Exam</td>
<td>• Interpret and understand Duties imposed by Group Engineering Standards - Part B</td>
<td>ADC 15,29/03, 05,12/04/2014 23,30/08, 06,13/09/2014 Edupark 10-13/03/2014 11-14/08/2014</td>
</tr>
<tr>
<td>Full time revision (Part A and Part B)</td>
<td>EIT Programme Trade Certificate</td>
<td>• Artisans • Foremen • Junior Engineers</td>
<td>4 Days</td>
<td>Prepare candidates for Mines health safety Exam Prepare candidates for Mine Standard Exam</td>
<td>• Interpret and understand Duties imposed by Mine Health and Safety Act - Part A. Duties imposed by Group Engineering Standards - Part B</td>
<td></td>
</tr>
<tr>
<td>Examination (Part A and B)</td>
<td>EIT Programme Trade Certificate</td>
<td>• Artisans • Foremen • Junior Engineers</td>
<td>1 Days</td>
<td>Determine if candidates prepared for Mine Health and Safety Act and Group Engineering Standards Exam.</td>
<td>• Competency determined by written examination.</td>
<td>06/06/2014 07/11/2014</td>
</tr>
</tbody>
</table>
## Specialized Skills Training (Facilitated by Outside Consultants)

<table>
<thead>
<tr>
<th>Training Programme (Name)</th>
<th>Minimum Entry Requirements</th>
<th>Target Population</th>
<th>Duration</th>
<th>Objective</th>
<th>Learning Outcomes (Critical Content / Tasks)</th>
<th>Date</th>
</tr>
</thead>
</table>
| Conveyor Belt Theory and Repair Techniques     | EIT Programme Trade Certificate | • Artisans  
• Foremen  
• Junior Engineers | 3 Days | Understanding the theory of conveyor belts. Splice a belt | • Understand the basic theory of material handling using conveyor belts  
• Identify types of conveyor belts and construction materials  
• Identify various applications for belt types  
• Store, handle and install conveyor belts  
• Appreciate costs of damages to conveyor belts  
• Understand splicing methods | 09-11/04/2014  
16-18/07/2014  
29-31/10/2014 |
| Lubrication and Filtration                     | EIT Programme Trade Certificate | • Artisans  
• Foremen  
• Junior Engineers | 3 Days | Understand basic additives in lubricants, understand grease types, understand key lubricant, understand lubrication fundamentals | • Store and handle filters  
• Identify minerals vs. synthetic oils  
• Lubricate compressors  
• Lubricate internal combustion engines  
• Lubricate anti-friction bearings  
• Lubricate gears  
• Lubricate plain bearing | 05-07/02/2014  
07-09/05/2014  
13-15/08/2014  
06-08/11/2014 |
<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
</table>
| Specialized Steel Rope Theory (Specific for EIT’s) | EIT Programme | • Junior Engineers  
• Engineers | 3 Days | Identify types of steel wire ropes  
Understand safety aspects when dealing with steel wire ropes | • Test steel wire ropes  
• Discuss rigging configuration and safe rigging practices  
• Identify reasons for premature failure of steel wire ropes  
• Lubricate steel wire ropes  
• Understand maintenance of steel wire ropes (shafts/drag lines)  
• Discuss grades of steel used in the construction of steel wire ropes  
• Understand how different steel wire rope types are produced  
• Identify construction and applications of steel wire rope | To be advised |
| Water Treatment Technology | EIT Programme  
Trade Certificate | • Artisans  
• Foremen  
• Junior Engineers | 1 Days | Understand the effect of contaminants on pump life  
Identify filtration and purification methods  
Understand methods of chemical addition | • Methods of chemical addition  
• Safety aspects of chemicals including storage  
• Pumping contaminated water  
• Methods to purify water  
• Identifying water treatment terminology | 11/04/2014  
11/07/2014  
17/10/2014 |
<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
</table>
| Gas Safety Seminar        | Phase 4/ Advance Plating Programme EIT Programme Trade Certificate | • Phase 4/ Advance Plating Learners  
                                    • Artisans  
                                    • Foremen  
                                    • Junior Engineers | 4 Days | The participant will be able to apply the basic principles to: Handling of gas cutting and welding equipment | • Gauge less regulators – pressures settings incorrect  
                                    • Misuse of gas equipment  
                                    • Live demonstrations on approved gas safety devices  
                                    • Contamination of multistage and single stage regulators  
                                    • LPG regulator installed on acetylene cylinder – working pressures excessive  
                                    • Flashbacks” on old and worn equipment  
                                    • Damaged bullnose on regulator caused by dropping – leaking gas causing explosion and bodily harm and damage to property  
                                    • Lubrication used on gas equipment – chemical reaction | 03-06/02/2014  
                                    24-27/03/2014  
                                    22-25/04/2014  
                                    19-22/05/2014  
                                    23-26/06/2014  
                                    07-10/07/2014  
                                    11-14/08/2014  
                                    08-11/09/2014  
                                    27-30/10/2014  
                                    24-27/11/2014 |
## SPECIALIZED SKILLS TRAINING (FACILITATED BY OUTSIDE CONSULTANTS)

<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
</table>
| Siemens PLC               | EIT Programme Electrical, Instrumentation Trade Certificate | • Artisans  
• Foremen  
• Junior Engineers | 5 Days | Use and maintain SIMATIC S7 programmable controllers | • Debugging a program  
• Binary operations and “GATES”  
• Counters / Timers  
• Rewiring of programs  
• Hardware handling  
• Commissioning and Monitoring / Modifying Variables  
• Linear / Structured Programming techniques  
• The SIMATIC S7 system family  
• STEP 7 installation techniques and components | ST-SERV1: 03-07/03/2014  
ST-SERV2: 05-09/05/2014  
ST-SERV1: 18-22/08/2014  
ST-SERV2: 10-14/11/2014 |
| Concrete Practice Course | EIT Programme             | • Artisans  
• Foremen  
• Junior Engineers | 3 Days | The participant will be able to: Understand the properties of concrete, materials and equipment  
Understand the methods used in its production and quality control  
Identify concrete related Hazards to maintain safety and production | • Pre-stressed concrete  
• Pre-cast concrete  
• Off-shutter and architectural finishes  
• Industrial floors on the ground  
• Concrete roads  
• Sampling and testing  
• Low density concrete  
• Protection and curing  
• Concreting in hot and cold weather | To be advised |
### SPECIALIZED SKILLS TRAINING (FACILITATED BY OUTSIDE CONSULTANTS)

<table>
<thead>
<tr>
<th>TRAINING PROGRAMME</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Centered management</td>
<td>EIT Programme Trade Certificate</td>
<td>• Artisans • Foremen • Junior Engineers</td>
<td>4 Days</td>
<td>The participant will be able to: Be competent to develop, implement and sustain a reliability based maintenance programme. Understand how to reduce life cycle support costs by eliminating the adverse effects of poor design on maintenance and logistics. Measure the effectiveness of Maintenance Management and its related Computerized Maintenance Management System ('CMMS' e.g. SAP PM) in your organization.</td>
<td>• Maintenance Assessment • Early Equipment Management and Failure Prevention • Business Centered Maintenance TRACC (Implementation Guidelines) • Focused Improvement Program • Continuous Improvement • Introduction to Business Centered Maintenance • Business Centered Maintenance Tasks • Developing the Maintenance Programme (Fast-TRACC RCM)</td>
<td>ADC: 14-17/04/2014 19-22/05/2014 08-11/09/2014 Union: 10-113/02/2014 20-23/10/2014 Edupark: 03-06/03/2014 02-05/06/2014 03-06/11/2014 Amandelbult: 24-27/02/2014 11-14/08/2014</td>
</tr>
<tr>
<td>Winder Brake Systems (Hydraulic)</td>
<td>EIT Programme Trade Certificate</td>
<td>• Artisans • Foremen • Junior Engineers</td>
<td>3 Days</td>
<td>Understand the hydraulic brake systems on wonders</td>
<td>• Practice construction of a winder brake system on training boards • Practice brake settings on winders • Static adjustments and tests • Dynamic tests • Brake components • Circuits • Operations</td>
<td>06-07/02/2014 03-04/07/2014 20-21/11/2014</td>
</tr>
</tbody>
</table>
7. DIESEL MECHANIC SHORT COURSES

DIESEL MECHANIC SHORT COURSES
<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (Name)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Brake Systems</td>
<td>- Basic Pneumatics</td>
<td>• Artisans • Foremen</td>
<td>2 days</td>
<td>To equipped artisans with Air Brake System knowledge and skills for repairing and servicing vehicles underground and on surface</td>
<td>The participant will be able to: • Interpret and understand an air flow circuit • Construct a circuit • Identify faults in fault finding</td>
<td>06-07/02/2014 05-06/06/2014 09-10/10/2014</td>
</tr>
</tbody>
</table>
8. FITTING & TURNING SHORT COURSES

FITTING & TURNING SHORT COURSES
### FITTING AND TURNING SHORT COURSES

<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (Name)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
</table>
| Roller Bearings           | Phase 4 /Advanced Fitting and Diesel Programme  
Trade Certificate  
EIT Programme  
Stopeservicemen Certificate | • Fitting/Millwrights/Diesel Artisans  
• Foremen  
• Engineers  
• EIT  
• Fitters/Diesel/Millwrights Learners  
• Stopeservicemen | 3 days | To equipped candidates with roller bearing knowledge and skills. | The participant will be able to:  
• Identify all rolling bearings  
• Understand the reason for selection of rolling bearings vs. other bearings  
• Understand the care, storage and correct installation procedures of rolling bearings  
• Understand maintenance requirements  
• Identify examples and reasons for bearing failures | 12-14/02/2014 11-13/06/2014 15-17/10/2014 |
| Alignment Refresher       | Phase 4 /Advanced Fitting Programme  
Trade Certificate  
EIT programme | • Fitting/Millwright Artisans  
• Foremen  
• Engineers  
• EIT  
• Fitters/Millwrights learners | 4 days | Candidates will be equipped with alignment knowledge and skills using different techniques e.g. Dial test Indicators, Lazer | The participant will be able to:  
• Align V-belt drives  
• Align chain drives  
• Align fluid drive couplings  
• Align tyre couplings  
• Align pin and bush couplings | 11-14/03/2014 08-11/07/2014 11-14/11/2014 |
| Basic Hydraulics          | Phase 4 /Advanced Fitting Programme  
Trade Certificate  
Exposure to Hydraulics systems(Workplace) | • Artisans  
• Foremen  
• Engineers  
• Fitters/Millwrights learners | 5 days | Candidates will be equipped with basic hydraulic knowledge and skills | The participant will be able to:  
• Understand the basic principles and theory of hydraulics including Hydraulic Safety  
• Identify hydraulic schematic symbols and understand their application  
• Understand hydraulic circuit operation  
• Understand planned maintenance associated with hydraulic components  
• Understand construction of industrial circuits  
• Practice circuit construction on training panels | 06-10/01/2014 10-14/03/2014 26-30/05/2014 25-29/08/2014 |
<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Pneumatics</td>
<td>Phase 4 /Advanced Fitting Programme Trade Certificate Exposure to Pneumatic Systems (Workplace)</td>
<td>• Artisans • Foremen • Engineers • Fitters/Millwrights learners</td>
<td>5 days</td>
<td>Artisans will be equipped with basic pneumatic knowledge and skills</td>
<td>The participant will be able to: • Understand basic principles and theory of pneumatics • Overview and safety • Air treatment devices • Cylinder and valve operations • “wet-screw” rotary type compressors • Reciprocating compressors • Identify pneumatic symbols and understand their application • Understand pneumatic circuit operation • Understand construction of industrial circuits • Understand planned maintenance • Identify motion diagrams and design of a cascade circuit diagram • Fault finding different circuits • Practice advanced circuit construction on training panels</td>
<td>03-07/02/2014 02-06/06/2014 17-21/11/2014</td>
</tr>
<tr>
<td>Centrifugal Pumps Refresher</td>
<td>Trade Certificate Stopeservicemen Certificate</td>
<td>• Fitting/Millwrights Artisans • Foremen • Engineers • Stopeservice men</td>
<td>3 days</td>
<td>Candidates will be equipped with centrifugal pump knowledge and skills.</td>
<td>The participant will be able to: • Differentiate between Hydroseal vs Centriseal • Understand adjustments to centrifugal pumps • Dismantle and assemble centrifugal pumps • Understand a maintenance schedule • Identify important warnings • Fault finding on centrifugal pumps</td>
<td>05-07/02/2014 04-06/06/2014 08-10/10/2014</td>
</tr>
<tr>
<td>TRAINING PROGRAMME (NAME)</td>
<td>MINIMUM ENTRY REQUIREMENTS</td>
<td>TARGET POPULATION</td>
<td>DURATION</td>
<td>OBJECTIVE</td>
<td>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</td>
<td>DATE</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------------------</td>
<td>-------------------</td>
<td>----------</td>
<td>-----------</td>
<td>--------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>White Metal Bearings</td>
<td>White Metal Bearing Exposure (workplace) EIT Programme</td>
<td>• All Engineering Personnel</td>
<td>1 day</td>
<td>Candidates will be equipped with White Metal Bearing knowledge and scraping techniques.</td>
<td>The participant will be able to: • Understand the process of remelting of white metal bearings • Machining white metal bearing shells • Fitting white metal bearings • Scraping white metal bearings</td>
<td>11/02/2014 10/06/2014 14/10/2014</td>
</tr>
<tr>
<td>Electro Pneumatics</td>
<td>Basic Pneumatic Course Trade Certificate</td>
<td>• Artisans • Foremen • Engineers</td>
<td>5 days</td>
<td>Artisan, Foreman, Trainee engineers, Engineers and Instrument Mechanics/Technicians will be equipped Electro Pneumatic knowledge and skills.</td>
<td>The participant will be able to: • Understand electrical principles • Identify and understand electro pneumatic symbols • Understand control methods. (Electro Pneumatics) • Understand fault finding procedures. • Practice electrical and pneumatic elements. (Relays, valves etc.) Hands on. • Understand electronic sensors and typical industrial circuits. Hands on. • Co-ordinate sequence controls • Practical advanced circuit construction on training panels.</td>
<td>10-14/02/2014 09-13/06/2014 24-28/11/2014</td>
</tr>
<tr>
<td>TRAINING PROGRAMME (NAME)</td>
<td>MINIMUM ENTRY REQUIREMENTS</td>
<td>TARGET POPULATION</td>
<td>DURATION</td>
<td>OBJECTIVE</td>
<td>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</td>
<td>DATE</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------------</td>
<td>-------------------</td>
<td>----------</td>
<td>-----------</td>
<td>---------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Conveyor Belt: Installation, Fault Finding, Maintenance</td>
<td>Phase 4 /Advanced Fitting Programme Trade Certificate</td>
<td>• Fitting/Millwright Artisans • Foremen • Engineers • Fitting/Millwright Learners</td>
<td>2 days</td>
<td>Candidates will be equipped with conveyor belt installation, fault finding, maintenance knowledge and skills.</td>
<td>The participant will be able to: • Understand the installation of conveyor belt systems • Identify faults on conveyor systems • Maintain conveyor systems</td>
<td>06-07/03/2014 03-04/07/2014 06-07/11/2014</td>
</tr>
<tr>
<td>Fluid Pumps</td>
<td>Phase 4 /Advanced Fitting Programme Trade Certificate Stopeservicemen Certificates</td>
<td>• Fitter/Millwrights Artisans • Foremen • Engineers • Stopeservice men</td>
<td>3 days</td>
<td>Candidates will be equipped with fluid pump knowledge and skills.</td>
<td>The participant will be able to: • Understand construction of slurry pumps • Maintain slurry pumps • Install slurry pumps, including valving and piping requirements • Understand pump efficiency, monitoring and trouble shooting • Identify pump capacities • Understand pump installation and removal and Understand pumping costs ans areas of focus to minimise costs • Understand pumping costs and areas of focus to minimise costs</td>
<td>08-10/04/2014 12-14/08/2014 18-20/11/2014</td>
</tr>
</tbody>
</table>
## FITTING AND TURNING SHORT COURSES

<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulics Systems Trouble Shooting</td>
<td>Basic Hydraulics course</td>
<td>• Artisans</td>
<td>5 days</td>
<td>Artisans will be equipped with Hydraulics Systems Trouble Shooting knowledge and techniques.</td>
<td>The participant will be able to: • Isolate a hydraulic system • Maintain a hydraulic system safely and correctly • Understand basic principles of cartridge valves • Understand cartridge valve functions and operation • Identify trouble shooting techniques • Isolate faults by systematically eliminating possibilities • Maintain control through good maintenance; Understand preventative maintenance routines Practical fault finding on training panels</td>
<td>13-17/01/2014 07-11/04/2014 19-23/05/2014 01-05/09/2014</td>
</tr>
<tr>
<td>Hydraulics Systems Trouble Shooting</td>
<td>Trade Test Certificate</td>
<td>• Foremen</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulics Systems Trouble Shooting</td>
<td></td>
<td>• Engineers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## FITTING AND TURNING SHORT COURSES

<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
</table>
| Electro Hydraulics        | -Basic Hydraulic course    | Artisans, Foremen, Engineers | 5 days   | Artisan, Foreman, Trainee engineers, and Engineers Will be equipped with Electro Hydraulic knowledge and skills. | The participant will be able to:  
• Understand electrical principles  
• Identify and understand Electro Hydraulic symbols  
• Identify and understand Electrical symbols  
• Understand control methods. (Electro Hydraulics)  
• Understand fault finding procedures.  
• Practice electrical and hydraulic elements. (Relays, valves etc.) Hands on.  
• Understand electronic sensors and typical industrial circuits. Hands on.  
• Co-ordinate sequence controls  
• Practical advanced circuit construction on training panels. | 17-21/02/2014 07-11/07/2014 18-22/08/2014 06-10/10/2014 |
|                           | Trade Certificate          |                   |          |           |                                             |      |
## FITTING AND TURNING SHORT COURSES

<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electro Proportional Hydraulics</td>
<td>-Basic Hydraulic course</td>
<td>Artisans, Foremen, Engineers</td>
<td>5 days</td>
<td>To equipped Artisan, Foreman, Trainee engineers, and Engineers with Electro Proportional Hydraulic knowledge and skills.</td>
<td>The participant will be able to:</td>
<td>14-18/04/2014</td>
</tr>
<tr>
<td></td>
<td>-Electro Hydraulic course</td>
<td></td>
<td></td>
<td></td>
<td>• Understand the principles of proportional hydraulics.</td>
<td>11-15/08/2014</td>
</tr>
<tr>
<td></td>
<td>-Trade Certificate</td>
<td></td>
<td></td>
<td></td>
<td>• Understand proportional valves, design and mode of operation.</td>
<td>03-07/11/2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Understand characteristic curves and parameters</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Understand the setting of amplifier and set point value specification.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Understand switching examples using proportional valves:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Speed control</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Leakage prevention</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Positioning</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Energy Saving</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Understand electronic sensors and electro hydraulic symbols.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Calculate motion sequence for a hydraulic cylinder drive.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Practical advanced circuit construction on training panels, using electrical and proportional elements (relays, sensors, valves, etc.). Hands on.</td>
<td></td>
</tr>
</tbody>
</table>
9. PLATER BOILERMAKER/WELDER SHORT COURSES

PLATER
BOILERMAKER/WELDER SHORT COURSES
## PLATER BOILERMAKER/WELDER SHORT COURSES

<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Plating Contour Marking</td>
<td>Phase 1, 4 &amp; 6 Plating Programme Trade Certificate</td>
<td>• Artisans</td>
<td>10 DAYS</td>
<td>To measure, do calculations in order to fabricate pipes.</td>
<td>• Use a centre finder and a contour marker&lt;br&gt;• Understand calculations of different types of pipes&lt;br&gt;• Fabricate different types of pipes&lt;br&gt;• Understand pipe cutting techniques&lt;br&gt;• Understand how to obtain sizes for pipes to be fabricated</td>
<td>27/01-07/02/2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Foremen</td>
<td></td>
<td></td>
<td></td>
<td>30/06-11/07/2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13-24/10/2014</td>
</tr>
<tr>
<td>Advanced Plating Developing</td>
<td>Phase 1, 4 &amp; 6 Plating Programme Trade Certificate</td>
<td>• Artisans</td>
<td>10 DAYS</td>
<td>To use drawing equipment, and drawing methods to draw and develop chutes and plating templates.</td>
<td>• Use drawing equipment effectively&lt;br&gt;• Interpret drawings&lt;br&gt;• Approach and apply the three drawing methods&lt;br&gt;• Develop and fabricate chutes (hoppers)&lt;br&gt;• Develop and make templates</td>
<td>10-21/02/2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Foremen</td>
<td></td>
<td></td>
<td></td>
<td>12-23/05/2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>01-12/09/2014</td>
</tr>
<tr>
<td>Arc Welding Refresher</td>
<td>Phase 1, 4 &amp; 6 Plating Programme Plating Trade Certificate</td>
<td>• Artisans</td>
<td>5 DAYS</td>
<td>To perform different welding methods.</td>
<td>• Distinguish between good and bad welding&lt;br&gt;• Weld a butt joint&lt;br&gt;• Weld a vertical-up butt joint&lt;br&gt;• Weld a horizontal butt joint&lt;br&gt;• Weld a overhead fillet joint&lt;br&gt;• Weld a vertical-up corner joint</td>
<td>03-07/03/2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14-18/07/2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10-14/11/2014</td>
</tr>
<tr>
<td>Advanced Arc &amp; MIG Welding</td>
<td>Refresher Arc Welding Phase 1, 4 &amp; 6 Plating Programme</td>
<td>• Artisans</td>
<td>10 DAYS</td>
<td>To perform basic welding positions and joints.</td>
<td>• Preheating and post heating techniques&lt;br&gt;• Distinguish between good and bad welding&lt;br&gt;• Preparing of work pieces before welding&lt;br&gt;• Use various welding techniques&lt;br&gt;• Weld various positions / joints</td>
<td>31/03-11/04/2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Foremen</td>
<td></td>
<td></td>
<td></td>
<td>21/07-01/08/2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>27/10-07/11/2014</td>
</tr>
</tbody>
</table>
# PLATER BOILERMAKER/WELDER SHORT COURSES

<table>
<thead>
<tr>
<th>TRAINING PROGRAMME NAME</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
</table>
| Angle Grinder           | All Engineering Programmes Knowledge and Understanding of Engineering Disciplines | All Engineering Personnel | 3 DAYS   | To use an Angle Grinder safely and correctly | • Identify the different machines  
• Identify defects in discs and different types of discs and their applications  
• Understand the operation of the grinder  
• Follow the correct procedure for disc replacement  
• Using the correct protective equipment | On Request and Approval Only |
| Plating Torch Cutting and Gas Welding | Phase 1, 4 & 6 Plating Programme  
Plating Trade Certificate | • Artisans  
• artisan Aides | 5 DAYS | To assemble, cut and weld with Oxy Acetylene equipment. | • Apply safety and care rules of oxy-acetylene equipment  
• Assemble equipment  
• Understand torch lighting procedures  
• Set different flames  
• Identify cutting techniques  
• Cut different profiles | 10-14/03/2014  
02-06/06/2014  
06-10/10/2014 |
10. ELECTRICAL SHORT COURSES
## ELECTRICAL SHORT COURSES

<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
</table>
| Medium Voltage            | EIT Programme Phase 4/ Advanced Electrical Programme Trade Certificate | • Electrical, Millwright Artisans  
• Foremen  
• Engineers | 7 days | To equipped artisans with skills regarding medium voltage reticulation, operation and maintenance. | The participant will be able to:  
• Apply and understand all safety procedures and standards  
• Correctly use medium voltage testing equipment  
• Test a medium voltage cable for possible defects  
• Read and interpret medium voltage reticulation circuits  
• Perform switching procedures  
• Perform transformer examinations and maintenance  
• Understand the operation of a bucholtz relay  
• Maintain medium voltage sub-stations | 20-28/01/2014  
10-18/02/2014  
04-12/03/2014  
24/03-01/04/2014  
05-13/05/2014  
19-27/05/2014  
23/06-01/07/2014  
14-22/07/2014  
28/07-05/08/2014  
11-19/08/2014  
01-09/09/2014 |
| Electrical Protection     | EIT Programme Phase 4/ Advanced Electrical Programme Trade Certificate | • Electrical, Millwright Artisans  
• Foremen  
• Engineers | 5 days | To equipped artisans with knowledge and skills of electrical protection systems on MV reticulation and sub-stations. | The participant will be able to:  
• Calculate fault levels of electrical circuits  
• Identify protection relays  
• Identify electric shock  
• Understand low voltage protection  
• Understand safety aspect of electrical protection  
• Understand feeder protection  
• Understand rating of circuit breakers  
• Understand earth leakage principles | 03-07/02/2014  
02-06/06/2014  
06-10/10/2014 |
<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor Control</td>
<td>EIT Programme Phase 4/ Advanced Electrical Programme Trade Certificate</td>
<td>• Electrical, Millwright Artisans • Foremen • Engineers</td>
<td>4 days</td>
<td>Artisans will be equipped with knowledge Understand the principles of motor and control gear protection</td>
<td>The participant will be able to: • Interpret and understand – critical functions and safety aspects of electric motor control • Understand the difference between manual and automatic control devices • Identify and understand the application of motors and starters • Identify multiple function products</td>
<td>10-13/03/2014 12-15/05/2014 08-11/08/2014</td>
</tr>
<tr>
<td>Fault Finding</td>
<td>EIT Programme Phase 4/ Advanced Electrical Programme Trade Certificate</td>
<td>• Electrical, Millwright Artisans • Foremen • Engineers</td>
<td>3 days</td>
<td>Artisans will be equipped with skills of applying diagnostic techniques to determine fault location</td>
<td>The participant will be able to: • Understand and apply electrical drawing symbols • Read and interpret electrical drawings • Determine the operation of electrical drawings • Use symptoms of failure to determine probable causes of failure • Apply a systematic approach to fault finding • Use testing equipment effectively</td>
<td>12-14/03/2014 09-11/07/2014 12-14/11/2014</td>
</tr>
<tr>
<td>Lilly Controller</td>
<td>-All persons involved in the maintenance and operation of a winding plant</td>
<td>• Artisans • Foremen • Engineers</td>
<td>3 days</td>
<td>Artisans will be equipped with knowledge and skills of safely maintaining and operating the lilly controller unit as part of a safety device in a winder.</td>
<td>The participant will be able to: • Identify all component parts • Understand operation of all parts • Setup the controller • Understand man/rock change over • Understand retardation graph development • Understand retardation cam profiling</td>
<td>05-07/03/2014 02-04/07/2014</td>
</tr>
<tr>
<td>TRAINING PROGRAMME (NAME)</td>
<td>MINIMUM ENTRY REQUIREMENTS</td>
<td>TARGET POPULATION</td>
<td>DURATION</td>
<td>OBJECTIVE</td>
<td>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</td>
<td>DATE</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------------</td>
<td>-------------------</td>
<td>----------</td>
<td>-----------</td>
<td>---------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Electrical Cable jointing and Terminating</td>
<td>EIT Programme Phase 4/ Advanced Electrical Programme Trade Certificate</td>
<td>• Electrical, Millwright Artisans  • Foremen  • Engineers</td>
<td>3 days</td>
<td>Artisans will be equipped with skills and knowledge of jointing and terminating MV cables.</td>
<td>The participant will be able to:  • Prepare and joint XLPE and PILC cables using mould and pressure joint  • Prepare and terminate XLPE and PILC cables using cold shrink methods  • Test cables after jointing and terminating for fault free operation</td>
<td>19-21/02/2014 26-28/03/2014 23-25/04/2014 21-23/05/2014 18-20/06/2014 16-18/07/2014 20-22/08/2014 17-19/09/2014 22-24/10/2014 19-21/11/2014</td>
</tr>
<tr>
<td>IGBT</td>
<td>-All Electrical personnel involved in maintenance of battery powered locomotives</td>
<td>• Electrical, Millwright Artisans  • Foremen  • Engineers</td>
<td>3 days</td>
<td>Artisans will be equipped with knowledge and skills of maintaining and repairing D.C. drive control systems</td>
<td>The participant will be able to:  • Understand D.C. motor drive theory  • Control D.C. motor speed (Forward and reverse)  • Understand theory and operation of silicon diodes and rectifiers  • Understand forced commutations, controlled braking and acceleration  • Understand safety aspects associated with D.C. control systems  • Practically do fault finding and repair  • Maintain batteries used on loco controllers</td>
<td>26-28/02/2014 30/04-02/05/2014 27-29/08/2014</td>
</tr>
</tbody>
</table>
11. INSTRUMENTATION & ELECTRONICS SHORT COURSES

INSTRUMENTATION & ELECTRONICS SHORT COURSES
## INSTRUMENTATION & ELECTRONICS SHORT COURSES

<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Electronics Module 1</td>
<td>EIT Programme Phase 4/ Basic Electrical Programme Trade Certificate</td>
<td>Electrical, Millwright and MC &amp; I Learners • Artisans • Foremen • Engineers</td>
<td>5 days</td>
<td>Artisan, Foreman, Trainee engineers, Engineers and Instrument Mechanicians/Technicians will be equipped electronic knowledge and skills.</td>
<td>The participant will be able to: • Identify and use Resistors • Identify and use Capacitors • Identify and use Inductors • Identify and use Diodes • Use an Oscilloscope • Rectification circuits</td>
<td>12-16/02/2014 25-29/08/2014</td>
</tr>
<tr>
<td>Basic Electronics Module 2</td>
<td>Basic Electronics Module 1</td>
<td>Phase 6/ Advanced Electrical, Millwright, Auto Electrical &amp; Instrument Learners • Artisans • Foremen • Engineers</td>
<td>5 days</td>
<td>Artisan, Foreman, Trainee engineers, and Engineers Will be equipped with electronics systems knowledge and skills.</td>
<td>The participant will be able to: • Identify Zener diodes • Voltage doubler • Identify Transistor action • Identify Transistor configuration • Regulated power supply • Test Thyristor • Thyristor phase control • Solder components</td>
<td>07-11/04/2014 20-24/10/2014</td>
</tr>
<tr>
<td>Advanced Electronics</td>
<td>Basic Electronics 1 &amp; 2</td>
<td>Phase 6/ Advanced Instrument Learners • Artisans • Foremen • Engineers</td>
<td>5 days</td>
<td>Artisan, Foreman, Trainee engineers, and Engineers Will be equipped with electronics systems knowledge and skills.</td>
<td>The participant will be able to: • Fault Finding Circuits • Test an Amplifier • Use a Transistor as a Switch • Test Multivibrators • Identify Operational Amplifiers • Test a Field Effect Transistor • Test Logic Gates • Construct a Continuity Tester</td>
<td>02-06/06/2014 17-21/11/2014</td>
</tr>
<tr>
<td>TRAINING PROGRAMME (NAME)</td>
<td>MINIMUM ENTRY REQUIREMENTS</td>
<td>TARGET POPULATION</td>
<td>DURATION</td>
<td>OBJECTIVE</td>
<td>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</td>
<td>DATE</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------------</td>
<td>-------------------</td>
<td>----------</td>
<td>-----------</td>
<td>---------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>DC Winders</td>
<td>Basic Winder Course</td>
<td>Electrical, Instrumentation Artisans and Junior Engineers, Foremen Engineers</td>
<td>3 day</td>
<td>Artisans will be equipped with knowledge of what a DC winder system consists of, importance and operation of each of the sub-systems as well as the fundamental principles involved</td>
<td>The participant will be able to: • Know what types of drives are used on winders and principles of operation of each driver • Know how speed control is achieved with the different types of drives • Know how control is achieved and understand the basic terminology Know what types of electrical &amp; electronic equipment or devices are used to achieve closed-loop control and Know what types of safety circuits and devices there are and the function of each</td>
<td>03-05/03/2014 15-17/09/2014</td>
</tr>
</tbody>
</table>
### INSTRUMENTATION & ELECTRONICS SHORT COURSES

<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
</table>
| Basic Winders             | EIT Programme Electrical and Instrumentation Trade Certificate | Electrical, Instrumentation Artisans and Junior Engineers, Foremen Engineers | 3 days   | Artisans will be equipped with knowledge and skills of operation and maintenance of a basic winder. | The participant will be able to:  
- Winder brakes  
- DC / AC Motors  
- Power correction  
- Controller’s:  
  - Rotorvar  
  - Statorvar  
  - Rectivar  
  - DC-Analog  
  - AC-cycle  
- Safety CCT:  
  - Mains  
  - Back up  
  - Lock out  
  - Lilly  
  - Maintenance  
- Regulations | 22-24/01/2014 |
| AC Winders                | Basic Winder Course         | Electrical, Instrumentation Artisans and Junior Engineers, Foremen Engineers | 3 days   | Artisans will be equipped with basic winders systems Trouble Shooting knowledge and techniques. | The participant will be able to:  
- Know what a AC winder system consists of and importance and operation of each of the sub-systems as well as the fundamental principles involved  
- Know what types of drives are used on winders and principles of operation of each driver  
- Know how speed control is achieved with the different types of drives  
- Know how control is achieved and understand the basic terminology  
- Know what types of electrical & electronic equipment or devices are used to achieve closed-loop control  
- Know what types of safety circuits and devices there are and the function of each | 03-05/11/2014 |
12. RIGGING ROPESMAN SHORT COURSES

RIGGING ROPESMAN SHORT COURSES
<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspection &amp; use of Overhead, Gantry and Jib Cranes</td>
<td>Inspection and Maintenance of Hoist Ropes</td>
<td>• Artisans • Foremen • Engineers</td>
<td>1 DAY</td>
<td>To refresh knowledge and skills on an OHC</td>
<td>• Identify the major components of O.H.C. • Perform inspections on O.H.C. • Use overhead, gantry and jib</td>
<td>04/03/2014, 03/06/2014, 09/09/2014</td>
</tr>
<tr>
<td>Inspection and Maintenance of Hoist Ropes</td>
<td>Winder and Hoist Rope Exposure(Workplace) Rigger Training Programme Trade Certificate</td>
<td>• Artisans • Foremen • Engineers • Rigger Learners</td>
<td>2 DAYS</td>
<td>To understand the principles of Inspection, maintenance of hoist ropes.</td>
<td>• Understand manufacturing of ropes • Identify various types of ropes • Identify faults in ropes • Inspect rope sheaves • Coil ropes correctly • Care and maintenance of ropes • Perform inspection on ropes • Lubricate ropes • Cut back-ends of ropes</td>
<td>04-05/02/2014, 08-09/04/2014, 05-06/06/2014, 11-12/09/2014, 04-05/11/2014</td>
</tr>
<tr>
<td>Rigging Skills / Safe Lifting Techniques</td>
<td>Knowledge and Understanding of Engineering Disciplines</td>
<td>• All Engineering Personnel</td>
<td>2 DAYS</td>
<td>To obtain knowledge and understanding when using rigging equipment to lift and move loads.</td>
<td>• Identify and inspect rigging equipment • Lift equipment safely using the correct slinging methods • Move equipment safely using various techniques • Handle equipment safely using various techniques • Understand rope charts, safe working loads, breaking loads</td>
<td>05-06/02/2014, 09-10/04/2014, 24-25/06/2014, 12-13/08/2014, 07-08/10/2014</td>
</tr>
</tbody>
</table>
# RIGGING ROPESMAN SHORT COURSES

<table>
<thead>
<tr>
<th>TRAINING PROGRAMME (NAME)</th>
<th>MINIMUM ENTRY REQUIREMENTS</th>
<th>TARGET POPULATION</th>
<th>DURATION</th>
<th>OBJECTIVE</th>
<th>LEARNING OUTCOMES (CRITICAL CONTENT / TASKS)</th>
<th>DATE</th>
</tr>
</thead>
</table>
| Safety Detachment Hook    | Inspection and Maintenance of Hoist Ropes | • Artisans  
• Foremen  
• Engineers  
• Rigger  
• Learners | 1 DAY | To create understanding on the types, inspections and operation of Safety Detachment Hooks. | • Identify the types of S.D.H.  
• Identify and inspect components  
• Understand the operation and function of the S.D.H.  
• Understand the various inspections on the S.D.H.  
• Use a S.D.H. according to the Mines Health and Safety Act | 06/03/2014  
20/05/2014  
08/07/2014  
16/09/2014  
05/11/2014 |
| Resin capping             | Inspection and Maintenance of Hoist Ropes | • Rigger  
• Artisans  
• Foremen  
• Engineers | 2 DAYs | To obtain knowledge and understanding regarding the installation of Resin capping on a Winder Rope | • Understand CSIR evaluation for white metal and resin capping  
• Understand resin capping of steel wire ropes  
• Explain task procedure for resin capping  
• Understand health and safety data sheet for resin capping  
• Install resin into a winder rope socket - practical | 28-29/01/2014  
25-26/03/2014  
27-28/05/2014  
09-10/07/2014  
21-22/10/2014 |
13. GENERAL TERMS & CONDITIONS OF SERVICE

The following outlines the general terms and conditions that govern the appointment of ESTC to deliver the above services:

1. ESTC will deliver the agreed services according to the specified requirements, standards and timeframes, as mutually agreed and documented by ESTC and the client organisation.
2. Deviations from agreed quotations will be mutually discussed and agreed.
3. The client and ESTC will conform to the Agreement to Purchase and Terms & Conditions of Sale as specified.
4. ESTC and the client will conform to mutual confidentiality, technology and copyright protection requirements.
5. The client and its employees may only use ESTC technology and learning materials within those internal areas agreed/licensed by ESTC.
6. ESTC must receive a signed quotation and Purchase Order Number prior to commencement of rendering required service.
7. A signed Quotation and Purchase Order Number implies that the service terms and conditions are accepted.

14. GENERAL PAYMENT TERMS & CONDITIONS

1. The total cost includes VAT.
2. Payment excludes air travel and car hire. The use of ESTC vehicles for car travel is charged at R 3.50 per kilometre for the full distance.
3. Invoices will be generated for each training intervention on the date of commencement and payment must be received prior to the release of certificates.
4. Payment terms are strictly 30 days from the presentation of invoices.
5. Cancellation of scheduled training, in three (3) working days or less, will incur the full Training service fee. Please notify the office in writing of the cancellation.
6. Postponement of scheduled training within three (3) working days will be invoiced in full, and an extension period to the next scheduled course will apply for the delivery of the training.
7. Withdrawal of candidate from scheduled training after commencement will be invoiced in full and the extension period for the next scheduled course will apply for the delivery of the training.
8. Replacement of nominated candidates should be done in writing prior to commencement of training.