

Industry Standards – Utilities Engineering Technician

Utilities engineering technicians create and test technological equipment for consumer and commercial use. In the utilities industry, engineering technicians focus on equipment used for producing and maintaining water supplies, electricity, hydraulic power, nuclear power and natural resources. Most choose to specialise in a particular utility field, although many have a general knowledge of how equipment functions.

The very essence of engineering is problem solving. Creating and maintaining electrical, mechanical and ICA systems is only a small part of the equation; knowing how to work with people, ideas, data and economics makes a rounded utilities engineering technicians.

Multiple job sites provide different challenges for utilities engineering technicians. Some may work for large organisations, installing and maintaining large pieces of plant and equipment, such as keeping waste management / recycling facilities running, ensuring pumping stations keep functioning or keeping the power supply running, whilst others may work at smaller complexes maintaining water supplies and power in buildings and installing backup generators for emergencies. Several work at manufacturing plants or at outdoor job sites supervising the construction of turbines, maintaining anaerobic digestion plants and other large equipment.

They play a key role in keeping cities, counties and towns running smoothly, and can help mitigate the effects of storms and power outages. Because utilities engineering technicians frequently have to work on emergency projects, they may be kept on call or work evenings and weekends.

Utilities engineering technicians regularly inspect utilities for problems. An electrical engineering technician, for example, may have to conduct annual inspections of electrical facilities. If there's a problem with the inspection site, the engineer may fix it or design a plan to have someone else fix it. In some cases, this might require seeking permits. Utilities engineering technicians must have a basic understanding of which projects are immediately permissible and which require authorisation.

The UET has three different discipline areas:

- Electrical Engineering Technician
- Mechanical Engineering Technician
- Instrumentation, Control and Automation (ICA) Technician

Electrical Engineering Technician Pathway

This standard is for someone looking to recruit and train someone to install, maintain and support electrical equipment within their organisation.

Some electrical engineering technicians will need to be multi-functional and will have to undergo some mechanical engineering training as well.

Electrical engineering technician role

Electrical engineering (sometimes referred to as electrical and electronic engineering) is a professional engineering discipline that deals with the study and application of electricity, electronics and electromagnetism.

Electrical engineering technicians in the utilities industry will have to access a variety of different sites in order to install, maintain, test and repair electrical equipment. They will have to utilise electrical theories and principles to test equipment for voltage, current and earth resistance in order to make sure the equipment functions properly.

The electrical engineering technician will also have to be able to read and interpret design specifications to analyse and calculate electrical system parameters and cabling and technical drawings to install, position or re-locate electrical equipment. There are many fairly specialised concepts and terminology used by electrical engineering people; listed below are a few that are commonly used.

SCADA – Supervisory, Control and Data Acquisition – *a system that gathers loads of data and sends it to people and other systems that need the information.*

Network – *Usually refers to a data network, a bunch of cabling and hardware that transmits the data that the SCADA system needs from one place to another.*

PLC – Programmable Logic Controller – *an industrial computer system that ‘talks’ to the outside world and collects the data up and then gives it to the network so that the SCADA system shares with the world.*

Instrument – *a machine that measures the physical world and changes the measurement to an electrical signal that the PLC can understand.*

Induction Units (A) - Mandatory		
Unit Code	Title	Internal Ref
	Download all Induction Units here	
IND01	Health, Safety and the Environment	2243
IND02	Safety, Health and Environmental Awareness (SHEA) Water (Revised 2014)	2243
IND03	Risk Assessment	2243
IND04	Personal Protective Equipment (PPE)	2243
IND05	Lone Working	2243
IND06	Asbestos Awareness	2243
IND07	First Aid	2243
IND08	Manual Handling	2243
IND09	Operational Procedures	2243
IND10	Fire and Emergency Procedures	2243
IND11	Drug and Alcohol Awareness	2243
IND12	Equality & Diversity	2243
IND13	Customer Focus	2243
IND14	Team Working	2243
14a	Working with Others	2243
14b	Interpersonal Skills	2243
IND15	Control of Substances Hazardous to Health (COSHH)	2243
IND16	Security / Asset Protection (Including IT Protection)	2243
IND17	Industry Regulation	2243
IND18	Quality Systems and Procedures	2243
IND19	Water and Wastewater Industry Appreciation	2243
IND20	Work at Height	2243
IND21	Awareness of Confined Space	2243
IND22	Awareness of Permit to Work	2243

Common Core Units (B) - Mandatory		
Unit Code	Title	Internal Ref
CC01	Working at Height	2267
UET04	Equipment, Isolation and Lock-off	2270
Common Core Units (B) - Optional		
Unit Code	Title	Internal Ref
CC02	Medium Risk Confined Spaces	2268
CC03	National Water Hygiene Scheme	2269

Electrical Engineering Technician Specific Units (C)- Mandatory		
Unit Code	Title	Internal Ref
EE01	Inspection and Testing of Electrical Systems	2271

EE02	Safe Isolation of Electrical Equipment	2272
EE03	Maintain Electrical Earthing and Bonding Systems	2273
EE04	Install and Maintain Low Voltage Electrical Supplies	2274
EE05	Install and Maintain Motor Control Systems	2275
EE06	Fault Diagnosis on Electrical Systems	2276
EE07	Installation of Electrical Equipment	2277
EE08	Equipment Inspection and Condition Monitoring	2278

Mechanical Engineering Technician Pathway

Mechanical engineering is one of the oldest roles known and crucial to the smooth running of water and wastewater networks, power plants and networks and waste management and recycling facilities.

Technically, mechanical engineering is the application of the principles and problem-solving techniques of engineering from design to manufacture for any object required by the organisation. Mechanical engineers analyse work using the principles of motion, energy and force, ensuring that designs function safely, efficiently and reliably, all at a competitive cost.

Mechanical engineers may design a component, a machine, a system or a process, ranging from macro to micro, from the largest systems to the smallest components, and this requires that mechanical engineers' education and learning is versatile. Anything that needs to be manufactured, or anything that has moving parts needs the expertise of a mechanical engineer.

Induction Units (A) - Mandatory		
Unit Code	Title	Internal Ref
	Download all Induction Units here	
IND01	Health, Safety and the Environment	2243
IND02	Safety, Health and Environmental Awareness (SHEA) Water (Revised 2014)	2243
IND03	Risk Assessment	2243
IND04	Personal Protective Equipment (PPE)	2243
IND05	Lone Working	2243
IND06	Asbestos Awareness	2243
IND07	First Aid	2243
IND08	Manual Handling	2243
IND09	Operational Procedures	2243
IND10	Fire and Emergency Procedures	2243
IND11	Drug and Alcohol Awareness	2243
IND12	Equality & Diversity	2243
IND13	Customer Focus	2243
IND14	Team Working	2243
14a	Working with Others	2243
14b	Interpersonal Skills	2243
IND15	Control of Substances Hazardous to Health (COSHH)	2243
IND16	Security / Asset Protection (Including IT Protection)	2243
IND17	Industry Regulation	2243
IND18	Quality Systems and Procedures	2243

IND19	Water and Wastewater Industry Appreciation	2243
IND20	Work at Height	2243
IND21	Awareness of Confined Space	2243
IND22	Awareness of Permit to Work	2243

Common Core Units (B) - Mandatory

Unit Code	Title	Internal Ref
CC01	Working at Height	2267
UET04	Equipment, Isolation and Lock-off	2270

Common Core Units (B) - Optional

Unit Code	Title	Internal Ref
CC02	Medium Risk Confined Spaces	2268
CC03	National Water Hygiene Scheme	2269

Mechanical Engineering Technician Specific Units (C) - Mandatory

Unit Code	Title	Internal Ref
ME01	Welding Operations	2279
ME02	Maintenance of Mechanical Equipment	2280
ME03	Commission and Handover of Equipment	2281
ME04	Identify Mechanical Equipment and Systems (knowledge)	2282
ME05	Fault Diagnosis and Location on Mechanical Systems	2283
ME06	Understand Mechanical Engineering Equipment (knowledge)	2284
ME07	Produce Replacement Components	2285
ME08	Restore Mechanical Equipment by Repair	2286
ME09	Condition Based Maintenance of Mechanical Equipment	2287
ME10	Assist in the Installation of Mechanical Equipment	2288
ME12	Maintain Emergency Power Generation Equipment (mandatory for CHP)	2290
ME13	Maintain Hydraulic Systems	2291
ME14	Maintain Pneumatic Systems	2292
ME15	Pipework Fabrication and Assembly	2293

Optional Units

Unit Code	Title	Internal Ref
ME11	Maintain Process Control Equipment	2289
ME12	Maintain Emergency Power Generation Equipment (mandatory for CHP)	2290

Instrumentation, Control and Automation Pathway

This standard is for someone looking to recruit and train someone to install, maintain and support instrumentation, control and automation equipment within their organisation.

ICA is an acronym for Instrumentation, Control and Automation; the water industry uses a great deal of equipment to automate processes and gather business critical information and the ICA equipment allows this to happen. The ICA equipment together with mechanical and electrical (MEICA) equipment makes the modern water industry tick.

Ultimately, the ICA world is all about remote intelligence, being able to 'see' what the treatment process is doing and make automated decisions based on information gathered by instruments and devices strategically placed within the treatment processes and water networks.

The ICA arena is very large and diverse, but when looked at up close it's all about electrical signals, predominantly from instruments measuring something.

There are many fairly specialised concepts and terminology used by ICA people, listed below are a few that are commonly used.

SCADA – Supervisory, Control and Data Acquisition – *a system that gathers loads of data and sends it to people and other systems that need the information.*

Network – *Usually refers to a data network, a bunch of cabling and hardware that transmits the data that the SCADA system needs from one place to another.*

PLC – Programmable Logic Controller – *an industrial computer system that 'talks' to the outside world and collects the data up and then gives it to the network so that the SCADA system shares with the world.*

Instrument – *a machine that measures the physical world and changes the measurement to an electrical signal that the PLC can understand.*

ICA engineer role

The ICA engineer's role is to provide an extensive set of technical skills to deliver instrumentation and control solutions within the water industry. He / she will carry out planned and reactive maintenance of ICA equipment, fault finding and repairs of PLC, SCADA, telemetry and alarm systems, ensuring that all work is carried out in line with statutory and regulatory guidelines associated with the water industry and electrical, mechanical and instrumentation standards.

Induction Units (A) - Mandatory		
Unit Code	Title	Internal Ref
	Download all Induction Units here	
IND01	Health, Safety and the Environment	2243
IND02	Safety, Health and Environmental Awareness (SHEA) Water (Revised 2014)	2243
IND03	Risk Assessment	2243
IND04	Personal Protective Equipment (PPE)	2243
IND05	Lone Working	2243
IND06	Asbestos Awareness	2243
IND07	First Aid	2243
IND08	Manual Handling	2243
IND09	Operational Procedures	2243
IND10	Fire and Emergency Procedures	2243
IND11	Drug and Alcohol Awareness	2243
IND12	Equality & Diversity	2243
IND13	Customer Focus	2243
IND14	Team Working	2243
14a	Working with Others	2243
14b	Interpersonal Skills	2243
IND15	Control of Substances Hazardous to Health (COSHH)	2243
IND16	Security / Asset Protection (Including IT Protection)	2243
IND17	Industry Regulation	2243
IND18	Quality Systems and Procedures	2243
IND19	Water and Wastewater Industry Appreciation	2243
IND20	Work at Height	2243
IND21	Awareness of Confined Space	2243
IND22	Awareness of Permit to Work	2243

Common Core Units (B) - Mandatory		
Unit Code	Title	Internal Ref
CC01	Working at Height	2267
UET04	Equipment, Isolation and Lock-off	2270
Common Core Units (B) - Optional		
Unit Code	Title	Internal Ref
CC02	Medium Risk Confined Spaces	2268
CC03	National Water Hygiene Scheme	2269

Instrumentation, Control and Automation Specific Units (C) - Mandatory		
Unit Code	Title	Internal Ref
ICA01	Electronics Theory and Principles (knowledge)	2294

ICA02	Theory of Instrumentation for Process Monitoring and Control (knowledge)	2295
ICA03	Process Automation Control Protocol	2296
ICA04	Install, Configure and Maintain PLCs	2297
ICA05	Commission and Handover ICA Equipment	2298
ICA06	Installation and Maintenance of ICA Equipment	2299
ICA07	Theory of Digital Systems (Knowledge)	2300
ICA11	Planned Preventative Maintenance of ICA Equipment	2304
ICA12	Use Data Storage, Security, Maintenance and Cleansing Systems	2305
ICA13	Fault Diagnosis and Repair on ICA Equipment	2306
ICA14	Install and Maintain Data Network Equipment	2307
ICA15	Install and Maintain Control Valve Actuators	2308
Optional Units – must complete a minimum of ONE:		
Unit Code	Title	Internal Ref
ICA08	Install, Use and Maintain SCADA Systems	2301
ICA09	Install, Configure and Maintain Telemetry Systems	2302
ICA10	Install, Configure and Maintain Alarm and Security Systems	2303