

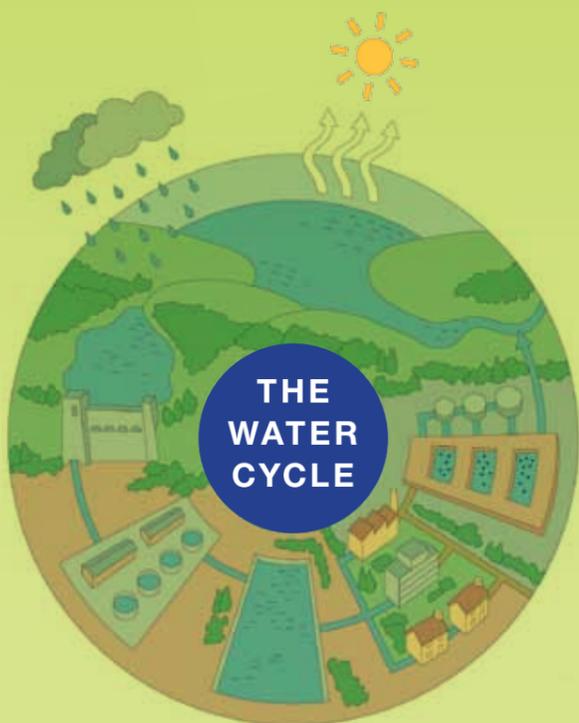


Level 4 Water

Level 4 Diploma in Water Industry Operations and Management

A new Level 4 qualification
for professionals working within the
Water Industry.





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Matthew Wright
Chief Executive Officer
Southern Water

The Level 4 Diploma in Water Industry Operations and Management has been developed with the Water Industry, for the Water Industry. It covers all the topics necessary for us to have a workforce that fully understands our business – both technical and business related. Employees will be able to take modules in topics specific to the area of business they work in, but can also learn about other areas of the business. Modules offered include: Water Treatment, Wastewater Treatment, Managing Operational Resources and Leadership and Management – and each is awarded a certificate in its own right. By successfully completing a range of modules, participants will be awarded the Diploma.

Southern Water is proud to be associated with this new qualification. The Water Industry is changing and this qualification is flexible enough to support our business moving forward. It will also help us to attract and retain the next generation of professionals into our Industry. Most important of all, it will help ensure our customers continue to receive the high quality of service they expect and deserve.



The Level 4 Diploma in Water Industry Operations and Management

The Level 4 Diploma in Water Industry Operations and Management offers a flexible, comprehensive qualification for professionals working in the sector. The qualification is nationally recognised and is available throughout the UK. It has been approved by Ofqual and is accredited by the CABWI Awarding Body.

The programme offers flexible pathways and choices of modules for managers and team leaders who want to learn more about the discipline within which they are working. It does not simply focus on the technical skills and knowledge needed, but also covers the practical skills required to become a successful manager. These skill areas are finance and budgeting; project management; and leadership and development. There is also the option to take single units to gain specific skills and knowledge as required. A full qualification will not be awarded, but credits will be certified.

Level 4 Diploma and HNC comparison table

The Level 4 Diploma offers a flexible pathway and choice of modules for managers and team leaders who want to learn more about the discipline within which they are working. Not only does it focus on the technical skills and knowledge needed for their discipline, it covers the practical skills required to become a successful manager too. These include financial and budgeting skills and leadership and development skills.

There is also the option to take single units to gain skills and knowledge relating to that unit only. A full qualification will not be awarded but credits will be recognised.

	CABWI Level 4 Diploma in Water Industry Operations and Management	SQA HNC in Water Operations	Edexcel HNC in Construction and the Built Environment (Civil Engineering)
Water Industry specific qualification	Yes	Yes	In-part
Level	4	4	4
Number of credits	Between 94 and 104	96	120
Number of mandatory units	4	9	8
Number of optional units	6 required	No optional units available	No optional units available
Optional units available	22	2 additional units available	14 additional units available
Choice of optional units to customise qualification	Yes	No	No
Extent of possible customisation	Including the 4 mandatory units, the Level 4 Diploma is fully customisable to form a bespoke qualification pathway	Not customisable	Not customisable
Specific Water Industry Pathways	8 (plus 2 in development)	No	One generic pathway
Optimum Cohorts	Optimum cohort of 8 & maximum of 10 to encourage student opportunities to learn specific Industry subjects	Cohorts up to 16 due to the generic nature of taught material	Cohorts of up to 16 due to the generic nature of taught material
Typical number of delivery days	47-52 days	42 days	44 days
Typical delivery pattern	Block release, typically 2, 3 or 4 days duration	Block release, typically 2, 3 or 4 days duration	Block release, typically 2, 3 or 4 days duration
Typical course duration	Between 18 and 24 months study depending on the number of units	Between 18 and 24 months study depending on the number of units	Between 18 and 24 months study depending on the number of units
Assessment	Business related assignments Plus unit end test	Generic subject assignments and/or tests	Generic subject assignments and/or tests
Fees	Fees are based on chosen Pathway (either proscribed or customised), the number of Qualification Credits and cohort size	Fees are based on cohort size and additional units	Fees are based on cohort size and additional units



Qualification pathways



Qualification pathways

The Water Level 4 Diploma offers a comprehensive range of pathways, which are matched to the industry's principal functions and roles.

All pathways include four mandatory units.

- Water Industry structure and organisation (WOM401)
- Leadership and management (WOM402)
- Managing financial resources in the Water Industry (WOM403)
- Complete a Water Industry research project (WOM404)

- Each of the qualification pathways are made up of a variety of different units. The units have been chosen to reflect the skillset that is needed for each of the pathways
- The first four units listed on pages 6 and 7 are mandatory for all pathways
- There are various other units that can be studied in addition to those listed on pages 6 and 7. These are detailed on page 11
- Additionally, you have the option to add additional units to the pathway that you have taken

Water Treatment The qualification structure for Water Treatment addresses both the technical and managerial aspects of the roles in this key function of the industry. Students will learn the process of water resourcing, hydrology, demand forecasting, treatment processes and the importance of water quality. They will also gain an in-depth appreciation of the legislative drivers around water quality in the UK and a deep understanding of the science of water.

Water Distribution This pathway provides an insight into the production of treated water and how water distribution systems are designed and managed. It provides the knowledge for students to address: the management of pressure and flow; the principles of hydraulics; the selection, installation and maintenance of pipework systems; and the management and environmental impact of water leakages.

Wastewater Network This is the first level 4 qualification to specifically address the needs of the Wastewater Network Industry. It will equip students with a detailed understanding of the specifics of sewer design; the importance of effective contractual frameworks; the operation of the sewerage network; and reasons and remedies for structural failure. It also provides an insight into civil engineering principles and the management of construction projects.

Wastewater Treatment The Wastewater Treatment pathway offers students a broad framework to increase their knowledge of a range of advanced Wastewater technologies. It covers the scientific perspective of treatment principles; the environmental aspects of the discipline; and the management of waste using specific technologies, including activated sludge, dewatering and sludge disposal. It concludes with an examination of ways the energy and carbon agenda will affect the industry, in particular biomass and anaerobic digestion.

Trade Waste This is the first qualification of its kind to address the role requirements of those responsible for managing trade waste. Based on a sound understanding of the environmental impact and legislative aspects of trade waste and dealing in detail with the science behind the function, this qualification will equip students with the necessary skills to manage the complex commercial interface between the trader, wastewater treatment engineering considerations and the regulatory frameworks.

Asset Management Providing a water specific Asset Management (AM) route to knowledge (instead of a generic AM qualification), this pathway teaches students the principles of Asset Management. It also allows for study of optional modules from the operational module structure, such as wastewater and water treatment, hydraulics, civils, finance and contract law. This greatly enhances the overall learning experience in this important area of water activity and will prepare students for future industry developments, such as Building Information Modelling (BIM). These core modules (as with the Project Management pathway) can be enhanced with key operational modules, therefore contextualising the whole qualification for the specific role of the student.

Project Management Successful demonstration of skills in Project Management (PM) is at the core of utilities activities. This pathway is specifically designed for the Water Industry. It provides students with a thorough understanding of the key principles of project management, such as general management principles; the control of costs; environmental factors; and contract law in the context of construction. These core modules (as with the Asset Management pathway) can be enhanced with key operational modules, therefore contextualising the whole qualification for the specific role of the student.

Water Industry Operations This pathway provides a comprehensive overview of the entire function of the Water Industry. It is suitable for those seeking broad knowledge across the entire water cycle, in addition to other specialist pathways.

Units include:

- Water Treatment
- Water Distribution
- Waste Water Network
- Waste Water Treatment
- Other additional units needed to become a successful manager

Bespoke A bespoke pathway, catering for all roles within the Water Industry. It is for those who would prefer a route to the Diploma that more ideally meets their specific business and individual needs. This pathway would be made up of the four Mandatory units and any six of the other units, offering a bespoke approach to the Diploma.

Qualification pathways

Water Treatment	Credits	Water Distribution	Credits	Wastewater Network	Credits	Wastewater Treatment	Credits
Water Industry Structure & Organisation	8						
Leadership & Management	8						
Managing Financial Resources in the Water Industry	8	Managing Financial Resources in the Water Industry	8	Managing Financial Resources in the Water Industry	8	Managing Financial Resources in the Water Industry	8
Complete a Water Industry Research Project	8	Complete a Water Industry Research Project	8	Complete a Water Industry Research Project	8	Complete a Water Industry Research Project	8
Water Resources	12	Water Distribution	12	Operation & Maintenance of the Wastewater Network	12	Wastewater Treatment Processes	12
Water Treatment Processes	12	Water Quality Management	12	Wastewater Treatment Processes	12	Renewable Energy Systems	12
Understanding Water Sector Plant Identification, Engineering Maintenance & Operation	8	Understanding Water Sector Plant Identification, Engineering Maintenance & Operation	8	Understanding Water Sector Plant Identification, Engineering Maintenance & Operation	8	Understanding Water Sector Plant Identification, Engineering Maintenance & Operation	8
Management of Waste in the Water Industry	12	Water Industry Materials & Components	12	Water Industry Materials & Components	12	Management of Waste in the Water Industry	12
Managing Operational Resources	12	Hydraulic Principles & Application in the Water Industry	12	Hydraulic Principles & Application in the Water Industry	12	Managing Operational Resources	12
Water Quality Management	12	Customer Service in the Water Industry	8	Customer Service in the Water Industry	8	Activated Sludge & Advanced Wastewater Treatment Processes	12
Credits	98	Credits	94	Credits	94	Credits	94

Trade Waste	Credits	Asset Management	Credits	Project Management	Credits	Water Industry Operations	Credits	Bespoke pathway	Credits
Water Industry Structure & Organisation	8	Water Industry Structure & Organisation	8	Water Industry Structure & Organisation	8	Water Industry Structure & Organisation	8	Water Industry Structure and Organisation	8
Leadership & Management	8	Leadership & Management	8	Leadership & Management	8	Leadership & Management	8	Leadership & Management	8
Managing Financial Resources in the Water Industry	8	Managing Financial Resources in the Water Industry	8	Managing Financial Resources in the Water Industry	8	Managing Financial Resources in the Water Industry	8	Managing Financial Resources in the Water Industry	8
Complete a Water Industry Research Project	8	Complete a Water Industry Research Project	8	Complete a Water Industry Research Project	8	Complete a Water Industry Research Project	8	Complete a Water Industry Research Project	8
Water Treatment Processes	12	Management Principles & Application for Water Industry Construction Projects	12	Project Management for the Water Industry	12	Water Resources	12	Any other unit	*
Wastewater Treatment Processes	12	Civil Engineering Technology in the Water Industry	12	Civil Engineering Technology in the Water Industry	12	Water Treatment Processes	12	Any other unit	*
Managing Legal & Environmental Issues	8	Understanding Water Sector Plant Identification, Engineering Maintenance & Operation	8	Design Principles & Application for Water Industry Construction Projects	12	Water Distribution	12	Any other unit	*
Management of Waste in the Water Industry	12	Manage Operational Resources	8	Science & Materials for Water Industry Construction Projects	12	Operation & Maintenance of the Wastewater Network	12	Any other unit	*
Managing Operational Resources	8	Production Management for Water Industry Construction Projects	12	Production Management for Water Industry Construction Projects	12	Wastewater Treatment Processes	12	Any other unit	*
Renewable Energy Systems	12	Contractual Procedures & Procurement for the Water Industry	12	Contractual Procedures & Procurement for the Water Industry	12	Activated Sludge & Advanced Wastewater Treatment Processes	12	Any other unit	*
Credits	96	Credits	94	Credits	104	Credits	104	Total	*

Mandatory units for all pathways

* Dependent on units taken

Delivery & assessment of the Diploma

The aims of the Water Diploma

The Diploma caters for a variety of different learner requirements and aspirations. The qualification has been designed to ensure that there are opportunities to develop the skills to meet the needs of employers in the Water Industry and also to provide a platform from which learners might progress to further study.

General aims:

- Develop knowledge and skills relating to the Water Industry to enable a more effective contribution to the business needs
- Develop a comprehensive set of skills to carry out the role of a manager within the Water Industry
- Allow the development of study and research skills
- Enable progression to Higher Education and membership of Industry professional bodies, e.g. Institute of Water Officers

Specific aims:

- Provide an understanding of specific areas of the Water Industry
- Develop knowledge of water operations in terms of collection, treatment and distribution of water
- Equip candidates with an understanding of wastewater in terms of collection, treatment and disposal
- Develop knowledge of the legislative and regulatory context under which water operations are controlled
- Provide an understanding of the organisation and management of the Water Industry in the UK

Delivery and assessment

Delivery of the course

The course is classroom based and can be delivered at a location arranged with your company or by joining another course. The teaching is classroom based, but there will be an expectation that site visits within your own company are needed to gain the practical experience.

Assessment and testing

There will be testing and assessment throughout the course. The tests will cover at least 30% of the learning outcomes detailed on page 11. The majority of the assessments will be work based. You will be expected to take the classroom learning that you have acquired and use it to carry out a work based assessment.

Marking and grading

All modules will contain at least one work based assignment and one end of unit test. In some modules, there may be more than one of each, depending on the subject matter. All Learning Outcomes for the unit will be tested for understanding in either the work based assignment or the end test.

There is the ability to achieve any of the three grades listed below, depending on the mark achieved:

Distinction: 85%+

Merit: 70%–85%

Pass: 50%–69%

Future recruitment to the Water Industry – including Graduates

Where the Level 4 Diploma in Water Industry Operations and Management excels is in its attractiveness to both potential students and employers who are looking for a high level qualification matched to the roles within the sector. A potential new recruit to the industry now has the flexibility to choose a specific pathway to study, based on industry roles, specifically aligned to the principal activities of the sector. Human Resources professionals recruiting from outside of the industry at technician level or higher can now opt for a path of education where the flexibility of specific Water Industry pathways of study can be offered to new recruits.

School leavers getting older

With the UK Government raising the school leaving age (ROSLA), a greater proportion of young people will then be qualified to A Level standard. It may be that the current range of Level 3 qualification structures in the Water Industry is unlikely to appeal or be an appropriate match for these individuals seeking employment opportunities in the sector.

A UK Water undergraduate programme does not currently exist and therefore many students enter the industry with a non-related degree and require high level technical upskilling as part of their wider induction.

Watertrain already has a history of delivering a number of HNC/Level 4 technical programmes to Post Graduate students joining the Water Industry. Previously, the only qualifications suitable for graduates were the HNC in Water Operations and the HNC in Construction and the Built Environment (Civil Engineering). However, following feedback, it was concluded that the HNCs were no longer suited to the changing requirements of the sector. Watertrain developed the Level 4 Diploma in Water Industry Operations and Management. The qualification delivers flexibility of pathway options and a modular approach more closely associated with Post Graduate study preferences.

In addition to providing an ideal route for future graduates entering the industry, the Level 4 qualification provides the perfect platform to develop the future Water Higher Apprenticeship and therefore offers more choice to the school leavers of the future.

Water Industry Research Project

This unit has been developed to provide an opportunity for learners to demonstrate their understanding of outcomes achieved across a range of units. The anticipated outcome would be one or more conclusions reached through a structured process of research, which could be used to deliver a quantifiable business benefit.

The trainer led sessions will give the learner the tools and techniques needed to carry out a successful research project. The culmination of this activity would be the delivery of a presentation to a small panel of managers and tutors. This 'end panel presentation' will take place at a date to be arranged at the end of the Diploma.

Unit purpose and aims

This unit is designed to provide evidence that the learner can complete a research project to address a query, problem or suggest an improvement in an area that they have studied within their chosen pathway. The project would be expected to cross over several of the modules undertaken within their chosen pathway. This could be:

- the management of a water resource, or
- the principles of water treatment processes, or
- the basic principles and components of a water distribution network system, or
- the processes involved in the collection, treatment and disposal of wastewater

This unit is dependent on the demonstration of understanding how to carry out a research project in the Water Industry. It will require the learner to select an area, and relevant Water Industry operational activities, to research and identify objectives for a specific project in their chosen functional area. For this reason, it is recommended that the learner should have started the course and have completed some of the operational units.

Assessment of this unit will be by:

- The completion of an agreed business-related project that covers all assessment criteria
- The production of a project report, including the justification of any conclusions reached
- A presentation of the project to a suitable assessment panel, including a question and answer session

The subject

The presentation will be on a subject that will add benefits to both you and your company. You should discuss your intentions with your line manager, mentor or course sponsor. It should be of your choice, but agreed with your course tutor. The project will be on a subject linked to the operations of your company or the Water Industry.

As a guide, consider a problem or an issue related to your role where an improvement can be made. The improvement could be related to:

- Improving customer service
- Improving or ensuring the company's compliance with regulations
- Adding value for stakeholders
- Reduction of risks to the business

What is the new Level 4 Diploma in Water Industry Operations and Management?

It is a new qualification, at the same level as an HNC. It has been developed through consultation with the Water Industry to satisfy their need for a role-specific, but flexible structure that can be adapted to the needs of anyone working at Level 4 and above.

Is it a nationally recognised qualification?

Yes. The qualification is accredited through CABWI Awarding Body.

Who has developed it?

The new Level 4 Diploma has been developed with industry professionals from the UK Water Sector and CABWI, together with qualification and subject experts from Watertrain. The qualification drew on expertise from Water Companies, key Tier 1 Contractors and others with an interest in developing appropriate frameworks at Level 4.

Is it relevant to the Water Sector?

Yes. This is a new and revised suite of high level qualifications eminently suitable for the modern industry, based on proven HNCs and greatly enhanced and expanded to meet the needs of the Water Sector now and in the future.

How does it differ from the current HNC qualifications that are available?

The existing HNCs have a fairly rigid structure, with little flexibility. This sometimes requires an individual to complete units of study that may not be relevant to their role or need. The new Level 4 Diploma can be accredited as a role specific combination of units, a 'pick and mix' combination of units to suit an individual's need, or as standalone units to support a specific need.

Is it a classroom based qualification or more vocational?

The new Level 4 Diploma is a Knowledge Qualification and, as such, requires students to gain an in-depth understanding of principles outlined in the Learning Outcomes. Therefore, in the main, a student enrolling on the new Level 4 Diploma will expect a high proportion of classroom attendance throughout their studies.

Who is the qualification aimed at?

A key component of the new Level 4 Diploma is the flexibility it offers to roles across the whole spectrum of the Water Industry. For the first time at this level, students are able to undertake a course of study specific to their role. For more information on the roles the Diploma is aimed at, please go to: www.level4water.com

Do I actually need to be in a specific role in my company to enrol?

Experience has shown that matching the requirements of a national qualification to the specific job roles in the Water Industry can be challenging. This is fundamentally the reason why the new Diploma has a much greater degree of flexibility than its predecessors. It caters for those students who are not in specific industry roles or perhaps who have additional responsibilities within their companies. With its mix of Mandatory and Functional specific modules we are confident that selecting an appropriate pathway of study for all roles in the sector is possible. Watertrain's educational experts will be available to advise on specific individual requirements and pathway options.

Can I enrol as an individual or do I need to be working for a recognised employer?

Yes. You can enrol through your employer or as an individual.

Is it appropriate for people working in the Water Supply Chain, Consultants and Contractors?

Yes. The new Level 4 Diploma has been developed specifically to address the needs of the entire Water Sector; the Asset Owners and those organisations that support the industry.

Is the course Government funded in any way?

The process has started to place the Level 4 Diploma on the register of fundable qualifications. As soon as the result of this exercise is known, we will update www.level4water.com with the details.

How will I be assessed?

During the consultation process, Water Industry representatives requested an assessment strategy more aligned to the working environment. As a result, each unit will have up to 70% of assessment designed around work based assignments or projects, which cover the required Learning Outcomes and have a business benefit to the employers.

How long does the course last, what is the pattern of study and what would my commitment be outside of the classroom?

Typically, each unit will be divided into two day blocks of study 4–6 weeks apart. There will be work based assessment or research activities to be completed between study blocks. The commitment for each unit would vary on an individual's prior knowledge and experience. As a guide, an 8 credit unit would require 4 days attendance for learning delivery and a similar amount of time for research, study and assessment.

Will I have to travel to study?

We aim to deliver our courses as close to the student's place of work as possible, but this may also depend on whether you are intending to take a course of study sponsored by your employer or whether you are thinking of registering as an individual student. If you are likely to be sponsored by your employer, then we suggest that in the first instance you contact your own HR department.

Will I be able to sign up for a Level 4 Water Apprenticeship as well?

No not yet. We hope to have in place the necessary agreements and approvals to proceed to develop a future Water Higher Apprenticeship in due course. Please watch out for developments in this area through www.level4water.com

Will I receive a recognised certificate at the end of the course?

Yes. Upon successful completion you will receive one of the following forms of certification:

- If you complete the qualification by taking all required units within a specific pathway, your Level 4 Diploma certificate will have this pathway indicated after the qualification title.
- If you complete the qualification by taking all mandatory units (4) and a mixture of optional units (6) from across the qualification, your Level 4 Diploma certificate will only have the qualification title, without any pathway reference.
- If you complete an individual standalone unit, you will receive a certificate of unit recognition. You can build up to a full qualification over time by completing units in this way.

Can I just sign up for part of the course, a Module perhaps, and still receive a certificate?

Yes. Each individual module is nationally accredited and therefore attracts a QCF Credit Value. For more information please refer to www.level4water.com

Level 4 Diploma in Water Industry Operations and Management learning outcomes – unit list

CABWI reference	Unit title	Credit values	Approx duration in days
WOM401	Water Industry Structure and Organisation	8	4
WOM402	Leadership and Management	8	4
WOM403	Managing Financial Resources in the Water Industry	8	4
WOM404	Complete a Water Industry Research Project	8	4
WOM405	Wastewater Treatment Processes	12	6
WOM406	Water Industry Materials and Components	12	6
WOM407	Water Resources	12	6
WOM408	Water Quality Management	12	6
WOM409	Water Distribution	12	6
WOM410	Operation and Maintenance of the Wastewater Network	12	6
WOM411	Activated Sludge and Advanced Wastewater Treatment Processes	12	6
WOM412	Water Treatment Processes	12	6
WOM413	Management of Waste within the Water Industry	12	6
WOM414	Managing Operational Resources	8	4
WOM415	Managing Legal and Environmental Issues	8	4
WOM416	Renewable Energy Systems	12	6
WOM417	Customer Service in the Water Industry	8	4
WOM418	Hydraulic Principles and Application in the Water Industry	12	6
WOM419	Management Principles and Application for Water Industry Construction Projects	12	6
WOM420	Civil Engineering Technology in the Water Industry	12	6
WOM421	Production Management for Water Industry Construction Projects	12	6
WOM422	Contractual Procedures and Procurement for the Water Industry	12	6
WOM423	Project Management for the Water Industry	12	6
WOM424	Design Principles and Application for Water Industry Construction Projects	12	6
WOM425	Science and Materials for Water Industry Construction Projects	12	6
WOM428	Understanding Water Sector Plant Identification, Engineering Maintenance and Operation (D/503/1467)	8	4
WOM429	Understanding Health and Safety Legislation for Water Industry Operations (Y/503/1466)	8	4
WOM430	Understanding Water Sector Construction and Operational Processes Related to Compliance and the Environment (L/503/1464)	6	3
WOM431	Understanding the Chemical and Biological Characteristics of Water and Wastewater (J/503/1463)	6	3

Learning outcomes

UNIT WOM404 – special project

Unit title: Complete a Water Industry Research Project

Learning outcomes:

1. Identify and plan a project within the Water Industry
2. Develop and carry out the project
3. Evaluate the outcome of the project and identify lessons learned

UNIT WOM401

Unit title: Water Industry Structure and Organisation

Learning outcomes:

1. Explain the legislative and regulatory framework and structures of water undertakers in the UK
2. Explain the business of the UK Water Industry
3. Explain the principal features of financial methods used by private and public water undertakers

UNIT WOM402

Unit title: Leadership and Management

Learning outcomes:

1. Apply management techniques needed to supervise an activity
2. Propose a structure to improve organisational effectiveness for a given activity
3. Understand the role of management in developing and promoting team working

UNIT WOM403

Unit title: Management of Waste within the Water Industry

Learning outcomes:

1. Assess the performance and financial position of a business
2. Evaluate the financial information needs of stakeholders
3. Recommend sources of finance for specified purposes
4. Understand the main responsibilities and accountabilities of managing operational budgets

UNIT WOM405

Unit title: Wastewater Treatment Processes

Learning outcomes:

1. Understand preliminary and primary wastewater treatment processes
2. Understand biological wastewater treatment processes
3. Understand tertiary wastewater treatment processes
4. Understand sludge treatment and disposal methods

UNIT WOM406

Unit title: Water Industry Materials and Components

Learning outcomes:

1. Understand the properties and uses of Water Industry engineering materials
2. Understand how materials are selected for Water Industry network installation systems
3. Understand the function of components used within the Water Industry
4. Understand corrosion prevention methods for the Water Industry
5. Understand the materials and components for installation and rehabilitation of wastewater collection systems

UNIT WOM407

Unit title: Water Resources

Learning outcomes:

1. Understand the concepts of hydrology
2. Understand and calculate flow measurement
3. Understand key design features of water abstraction methods and how legislation impacts on them
4. Understand the factors affecting yield of water resources and factors involved in demand forecasting
5. Understand the practical management of water resources

UNIT WOM408

Unit title: Water Quality Management

Learning outcomes:

1. Understand the importance of quality control in drinking water operations
2. Understand legislation and controls relevant to the quality of drinking water
3. Understand the significance of quality indicators for drinking water operations
4. Understand quality infringements of drinking water and how they are remedied
5. Understand the practical management of water resources to avoid quality infringements

UNIT WOM409

Unit title: Water Distribution

Learning outcomes:

1. Design a typical water distribution system and explain the operation and maintenance strategy required
2. Understand the significance of flow and pressure within a water distribution system
3. Understand how to manage leakage within a water supply zone
4. Understand pipe laying operations in a water distribution network
5. Understand the inspection of plumbing systems for compliance with the water fittings regulations
6. Understand the requirements for maintaining water quality in the network

UNIT WOM410

Unit title: Operation and Maintenance of the Wastewater Network

Learning outcomes:

1. Understand the origins of sewage, its characteristic and risks
2. Understand the impact and control of trade effluent
3. Understand the operation and maintenance of wastewater systems and related installations
4. Understand the design and construction of wastewater systems
5. Understand the contractual framework used by the Water Industry for the operation and maintenance of wastewater systems

UNIT WOM411

Unit title: Activated Sludge and Advanced Wastewater Treatment Processes

Learning outcomes:

1. Understand scientific aspects of the activated sludge processes
2. Understand assets involved in the activated sludge processes
3. Understand activated sludge processes control
4. Understand the settlement of activated sludge and final settlement tank design
5. Understand the process variations used in advanced wastewater treatment
6. Understand the remedial processes for non-compliance

UNIT WOM412

Unit title: Water Treatment Processes

Learning outcomes:

1. Understand the background to and reasons for water treatment
2. Understand the processes used in the first stage screening of raw waters
3. Understand the principles of chemical handling and storage
4. Understand the principles and processes of raw water clarification
5. Understand the principles and processes of filtration
6. Understand the principles and processes involved in water disinfection
7. Understand the principles and processes of pH correction
8. Understand the principles and processes involved in other aspects of water treatment
9. Understand the principles and processes of sludge treatment at water treatment works
10. Understand new developments within water treatment

UNIT WOM413

Unit title: Management of Waste within the Water Industry

Learning outcomes:

1. Understand the key sources of waste in the Water Industry
2. Understand the impact of waste management legislation and its influence on waste strategy
3. Understand the principles of waste management

UNIT WOM414

Unit title: Managing Operational Resources

Learning outcomes:

1. Analyse the management of operations in relation to the business transformation process
2. Apply quality control measures and use quality improvement techniques
3. Utilise financial data in operations management

UNIT WOM415

Unit title: Managing Legal and Environmental Issues

Learning outcomes:

1. Understand the role of UK and European agencies as 'sources of law' and practice within the Water Industry
2. Understand relevant and current regulations within the Water Industry
3. Understand the key elements of contract law
4. Understand the key elements of employment law

Learning outcomes

UNIT WOM416

Unit title: **Renewable Energy Systems**

Learning outcomes:

1. Understand the carbon cycle, biomass and climate change
2. Understand the forms and diverse nature of biomass resource in the WasteWater Industry
3. Understand the treatment and utilisation of biomass resource in the Water Industry: mesophilic anaerobic digestion (MAD)
4. Understand the treatment and utilisation of biomass resource in the Water Industry: combined heat and power (CHP)
5. Understand the treatment and utilisation of biomass resource in the Water Industry: incineration
6. Understand the treatment and utilisation of biomass resource in the Water Industry: strategy formulation
7. Understand the forms of renewable energy in the Water Industry: not related to biomass
8. Understand the key elements of the relevant legislation and their influence on the Water Industry

UNIT WOM417

Unit title: **Customer Service in the Water Industry**

Learning outcomes:

1. Understand the needs and expectations of customers in a Water Industry context
2. Identify organisational actions required to promote excellent customer service
3. Evaluate the quality of customer service provision and identify actions to improve the customer service provision within the organisation
4. Make recommendations to improve customer service provision within the organisation

UNIT WOM418

Unit title: **Hydraulic principles and application in the Water Industry**

Learning outcomes:

1. Solve engineering hydrostatic problems
2. Solve engineering flow problems
3. Match pumps to the demands of a specific system
4. Undertake hydraulic experimental procedures

UNIT WOM419

Unit title: **Management Principles and Application for Water Industry Construction Projects**

Learning outcomes:

1. Understand the evolution of management principles and their application to the Water Industry
2. Understand the Water Industry in terms of organisational structures and activities
3. Understand the management techniques used in the Water Industry
4. Understand the methods of procurement and contracting used in the Water Industry

UNIT WOM420

Unit title: **Civil Engineering Technology in the Water Industry**

Learning outcomes:

1. Understand the methods and techniques used in earthwork activities
2. Understand the methods and techniques used to create substructures
3. Understand the methods and techniques used to create superstructures
4. Understand the hazards associated with civil engineering activities
5. Solve problems associated with civil engineering activities

UNIT WOM421

Unit title: **Production Management for Water Industry Construction Projects**

Learning outcomes:

1. Understand the principles and application of effective site management
2. Understand the importance of effective communication in planning and resource management
3. Apply cost forecasting, control and reporting techniques
4. Create planning and programming charts for construction projects
5. Understand how quality issues and environmental considerations are addressed during the production process

UNIT WOM422

Unit title: **Contractual Procedures and Procurement for the Water Industry**

Learning outcomes:

1. Understand the factors that affect the choice of procurement methods and contractual arrangements
2. Know current issues and best practice associated with the procurement of Water Industry services and projects
3. Know the roles and activities of the parties and organisations involved in the procurement of Water Industry services and projects
4. Understand construction contracts in terms of time, cost and quality
5. Understand procurement contracts in terms of supply chain management

UNIT WOM423

Unit title: **Project Management for the Water Industry**

Learning outcomes:

1. Understand the practice of project management
2. Understand the competencies and training required of project managers
3. Understand the duties and responsibilities of project managers
4. Understand how client objectives can be achieved through project management
5. Understand how project management adds value to a project

UNIT WOM424

Unit title: **Design Principles and Application for Water Industry Construction Projects**

Learning outcomes:

1. Understand the planning and design phases of the construction process
2. Understand the factors that affect the specification of materials and building services
3. Understand how environmental factors affect the planning and design phases of the construction process
4. Understand the roles and responsibilities of all parties involved in construction projects
5. Understand how technology affects the design and production phases of construction projects

UNIT WOM425

Unit title: **Science and Materials for Water Industry Construction Projects**

Learning outcomes:

1. Understand the properties and use of construction materials
2. Understand the structural behaviour of construction materials
3. Apply scientific principles to the design and use of buildings
4. Solve scientific problems in construction and the built environment

UNIT WOM428

Unit title: **Understanding Water Sector Plant Identification, Engineering Maintenance and Operation (D/503/1467)**

Learning outcomes:

1. Understand a range of mechanical plants in the Water Industry
2. Understand the use and characteristics of different types of pumps
3. Understand the use and maintenance of compressors and blowers
4. Understand the safe use of power supply and distribution
5. Apply mechanical engineering and electrical principles to Water Industry plants

UNIT WOM429

Unit title: **Understanding Health and Safety Legislation for Water Industry Operations (Y/503/1466)**

Learning outcomes:

1. Know health and safety legislation in the UK
2. Understand how health and safety law is acted upon in the Water Industry
3. Understand how health and safety risk is managed in the Water Industry

UNIT WOM430

Unit title: **Understanding Water Sector Construction and Operational Processes related to Compliance and the Environment (L/503/1464)**

Learning outcomes:

1. Know the regulatory requirements for construction in the Water Industry
2. Understand roles and responsibilities during construction projects
3. Understand regulatory compliance in Water Industry operations

UNIT WOM431

Unit title: **Understanding the Chemical and Biological Characteristics of Water and Wastewater (J/503/1463)**

Learning outcomes:

1. Understand the System International (SI) unit of measurement used in water and wastewater
2. Know and understand the chemical characteristics of water and wastewater
3. Understand the biological and microbiological characteristics of water and wastewater
4. Understand parameters used to measure quality of water, wastewater and trade effluent



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