CURRICULUM FOR PLUMBING
VG3 / IN-SERVICE TRAINING AT A TRAINING ESTABLISHMENT

Laid down as a regulation by the Norwegian Directorate for Education and Training on 21 February 2008 as delegated in a letter of 26 September 2005 from the Ministry of Education and Research pursuant to the Act of 17 July 1998 no. 61 relating to primary and secondary education (Education Act) Section 3-4 first paragraph.

Applicable from 1 August 2008

The objectives of the subject

Clean drinking water and purification of sewage water mean a lot for hygiene and the environment in modern society. The tasks of a plumber vary from simple repairs in private homes to installing complicated piping systems with automated control systems where work is done based on technical drawings and descriptions.

Learning in the subject shall ensure competence in completing underground piping networks and doing installions, servicing and repairs to sanitary facilities, water-borne heating systems and technical devices. Furthermore, learning in the subject shall contribute to finding the best possible use of resources by using heat pump technology and automating heating systems. Installing heating systems is important for good indoor climates in buildings, and for the natural environment.

Learning in the subject shall also contribute to promoting creativity, good working habits and the ability to communicate with customers, colleagues and other collaborators. Furthermore, learning in the subject shall show the extent of this trade as a traditional craft. Learning in the subject shall ensure compliance with environment, health and safety regulations.

Training completed and passed in the subject will lead to a Journeyman's Certificate.
The professional title is Plumber.

Structure

Plumbing consists of five main subject areas. The main subject areas complement each other, and should be viewed in relation to one another.

Overview of the main subject areas:

Year level	Main subject areas				
Vg3 / In-service training at a training establishment	Sanitary facilities	Water-borne heating systems	Sprinkler systems	Gas heating	Trade studies

Description of the main subject areas

Sanitary facilities
The main subject area deals with exterior and interior water and sewage pipes and sanitary equipment. It also covers leakage and pressure testing, and assembly and rehabilitation of sanitary facilities. Furthermore, it covers designing sanitary facilities and piping systems and calculating slope for water to fall correctly into drains. It also includes different methods for joining pipes using different materials.

Water-borne heating systems
The main subject area deals with designing, dimensioning, assembly and start-up of basic water-borne heating and heat pump systems. It also covers different welding techniques and methods for bending pipes, and the use of digital tools for heat and thermal calculations.

Sprinkler systems
The main subject area deals with the structure and assembly of water-borne sprinkler systems for houses. The selection of materials and equipment also belongs in this subject.

Gas heating
The main subject area deals with the structure and assembly of gas heating systems for houses. It also covers dimensioning and materials used for gas heaters and the properties of the different heating gases.

Trade studies
The main subject area deals with organising work, handling customers and work ethics. The main subject area includes current regulations for environment, health and safety. The selection of materials, tools, methods and equipment also belongs in this subject.

Basic skills

Basic skills are integrated into the competence aims for this course in areas where they contribute to the development of and are part of the subject competence. In Plumbing, basic skills are understood as follows:

Being able to express oneself orally in Plumbing involves communicating with customers, colleagues, and other collaborators. It also involves documenting working processes and servicing.

Being able to read in Plumbing involves locating relevant technical literature, regulations and standards. It also involves understanding the content and use of specifications, assembly instructions, drawings, product descriptions and work descriptions.

Numeracy in Plumbing involves reckoning time, weight, quantities and sizes. It also involves taking measurements for surface area, volume and dimensions.

Digital literacy in Plumbing involves using digital tools for planning, production, documenting, image processing, quality assurance and communication. It also involves using digital tools to measure, calculate and draw.

Competence aims

After Vg3

Sanitary facilities
The aims of the studies are to enable the apprentice to

- plan and carry out the construction of exterior and interior water and sewage pipes for houses
- design simple sanitary facilities for houses and basic dimensioning for water and sewage pipes
- do leakage and pressure tests on exterior and interior water and sewage pipes
- figure out the slope of a surface for water fall to the drain
- assembly and install sanitary equipment
- modernise and repair old sanitary facilities
- join pipe materials together using different methods
- perform work in line with ergonomic principles

Water-borne heating systems
The aims of the studies are to enable the apprentice to

- design, dimension and select materials for simple heating systems
- install, insulate and start-up basic water-borne heating systems based on installation instructions
- use digital tools for calculating heat and thermal properties
- use different welding techniques
- bend pipes made from different metals using different methods

- give an account of different energy sources for heating and explain how heat pump systems work
- select materials for heat pumps
- install basic heat pump systems

Sprinkler systems

The aims of the studies are to enable the apprentice to

- explain the structure of water-borne sprinkler systems for houses
- select pipes and parts for sprinkler systems for houses
- install basic sprinkler systems that use water as the extinguishing agent

Gas heating

The aims of the studies are to enable the apprentice to

- give an account of the properties of different gases used for heating
- give an account of the structure and components of gas heating systems, and tell how these work
- plan, dimension and select materials for small gas heating systems
- install basic gas heating systems in houses

Trade studies

The aims of the studies are to enable the apprentice to

- plan, carry out, document and evaluate own work in this occupation
- select and use correct materials and tools for work
- give an account of the history of the trade, and its place in society today
- act professionally when dealing with clients and customers
- perform work according to guidelines for work ethics
- use records of substances and products
- give an account of how hazardous substances are stored, handled and destroyed
- perform work in line with ergonomic principles
- perform work in line with current regulations for environment, health and safety
- discuss and elaborate on the significance of interaction at the workplace

Assessment

Vg3 Plumbing

Provisions for final assessment:

Main subject areas	Provision
Sanitary facilities Water-borne heating systems Sprinkler systems Gas heating Trade studies	All apprentices shall sit for a Journeyman's Examination, which is normally carried out over a period of five working days.

The provisions for final assessment are stipulated in the regulations of the Norwegian Education Act.