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CURRICULUM

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O5 – Education of trainers for the course "Bricklayer"

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Part I Introductory notes

This general plan of the education of vocational school focused on profession preparation was approved by the Standing Conference of the Ministers of Culture and Senators of Various States (KMK).

The general plan corresponds with relevant educational regulations of the federal countries (Federal Ministry of the Economy regulations or otherwise relevant Ministry in accordance with the Federal Ministry of Education, Science and Research and Technologies). The agreement process is regulated by a "common result protocol of 05.30.1972". The general plan describes and specifies minimum requirements.

It does not contain any methodological regulations for the education. The independent and responsible thinking and acting, like prevailing education goal is in these educational forms arranged preferentially. Parts of the overall methodological concept are already included in these forms. Any methodical procedure can be used in achieving this goal. Methods that instantly support the ability to act are particularly supported and dedicated to this goal and they should be adequately taken in consideration in the preparation of education process.

Countries will immediately adopt this general plan or enforce it into their own curriculum. In other case, it is necessary to mind that the result would be contained in general plan in time and professional agreement with relevant educational regulations.

Part II Training demands on educational institutions

A vocational school and educational establishment meet common educational demands in dual education .

The educational facility is independent place for education. It cooperates like an equal partner with all involved educational establishments. Its task is to arrange labor and general contents of education to pupils with a particular reference on demands of the labor education.

The vocational school and educational establishment have both labor and professional preconditions to provide education for an achieved goal. It deepens previously gained general education. It contributes to fulfilment of tasks in the profession as well as to cocreating of the world of work and society taking in consideration the social and environmental responsibility. In follows the regulations valid for this education process and school laws of single countries. Primarily, the education focused on the preparation for work is focused also for each support resource stately recognized education profession:

- The general plan of the Standing Conference of the Ministers of Culture and Senators of various States (KMK)
- The regulation on education with preparation for a profession (educational plan) of countries for business education.

According to the Framework Agreement on vocational schools and educational establishments (Regulation KMK of March 15, 1991), a vocational school and educational establishment has as a goal to:

- "arrange the ability to perform the profession and bind a professional competence with general skills of humanitarian and social kind,
- develop labor flexibility suitable for overcoming changing demands and preconditions for the world of work and society as well as in connection with the mutual growth of all Europe,
- arrouse the readiness for labor education and supplementary knowledge and skills deepening,
- support skills and readiness in accordance of labor and private individual's life and simultaneously ability to act independently, confidently and responsibly."

For achieving these goals, the vocational school and educational establishment have to:

- arrange a specific pedagogy for education focused on education roles. This pedagogy would accentuate the trade and business orientation;
- mediate qualifications that would include all labor issues of given field with respect to the necessary labor specialization;
- guarantee a diverse and flexible education offer that different skills and talents would be balanced, as well as fulfilled different demands of the labor market and society;

- within its capabilities to support and protect persons with disabilities and persons with worsened social status;
- alert to environment threats and injuries risks in accordance with a profession performance and private way of life; and familiarize with capabilities of their prevention or reduction.

The vocational school and educational establishment should also in general education, if it is within the curriculum, alert to centroidal issues of our era like:

- Employment and unemployment
- A peaceful co-existence of people, nations and cultures within a single world and guarantee of the cultural identity preservation
- An observance of natural subsistence as well as
- human rights guaranteeing.

These goals are focused on business skills development. With this we understand the readiness and ability of individuals to behave in a social, labor and private situations objectively, professionally, judiciously and thoughtfully, as well as taking into account the individual and social responsibility.

Business skills are developed in the professional, personal and social competences' areas.

Professional competencies show the readiness and capacity to purposefully, professionally in accordance with the methods and independently solve tasks and issues focused on the core of professional knowledge and skills, and judge and justify a result.

Personal competencies show individual's readiness and capacity to use, judge and resolve chances for development, requirements and restrictions in family, their profession and in public life, also to develop their talents, as well as to identify and develop a life plan. It also includes personal characteristics like independence, ability of critical thinking, responsibility and the ability to take obligations. Particularly, a valued development like independent evaluation of values also belongs there.

Social competencies are related to readiness and ability to live and form social relationships, express a support, suppress a tension, prove a rational and responsible understanding with others. Particularly, the development of social responsibility and solidarity belongs there.

Methodological and teaching competencies are developed from obtained development of these three areas.

Part III Didactic principles

Goals determination of technical education requires and adaptation of education to the pedagogy type carried out at vocational schools. This pedagogy supports the business orientation and teaches young people to independently plan, perform and judge labor tasks within their labor activity.

The education at the vocational school or educational establishment mainly consists from the relationship to a specific, operated and labor action, as well as from reasoning operations' development and thoughts understanding and treating with others.

This education is focused primarily on a reflection and business ways (business plan, processes and results). The preconditions for education within a labor activity will be fulfilled by these thoughts on labor activity. For the general plan it means that the goal and contents selection applies to a profession.

On the basis of education-theoretical and didactic knowledge, the following landmarks are named:

- Didactic reference points are situations for which the profession performance is relevant (education for business).
- The starting point of education is made from negotiations which are carried out separately or are intellectually understandable (studying through action).
- Negotiations must be planned, carried out, checked and adjusted and evaluated separately.
- They should support an overall understanding of labor issues like technical, safety-technical, economic, legal, ecological and social aspects.
- They must be integrated into the apprentice's labor skills and reflected in connection with social consequences.
- They also should include social processes, like an interests explanation or conflicts prevention.

Education focused on labor skills is created by a didactic concept that covers together professional and business structures. It can be realized in a variety of educational methods.

Part IV Introduction related to the profession

Presented general curricula for vocational education in the construction economy are in compliance with relevant general educational plans mentioned in the "Regulations on Vocational Education in Construction Economy".

Educational professions are listed according to the Regulation of the accounting year of Vocational Education Federal Ministry of Education, Science and Research in the architectural technique sector.

of vocational school on the basis of “Elements for education at the vocational schools in field of study Economic and Social Education of Industrial-technical Education Professions” (result of the conference of Ministries of Culture from May 18, 1984) will be arranged for purposes of the exam field of study of Economic and Social Education of Industrial-technical Education Professions.

Presented general curricula are based on the following school goals in all education professions in construction economy:

Pupils:

- Understand principles and measures directed to ensuring the safety and health and preventing or suppressing creation of accidents and labor injuries as well as prevention from occupational diseases,
- Apply principles of ecological engineering, particularly in relation with the environment protection and the rational energy use,
- Develop responsible awareness for industrially and ecologically tolerable use of materials,
- Develop decision-making and negotiating competencies and skills in personal and business situations and interact in the conflicts suppression of personal and professional type,
- Deploy new technologies and labor tools in the planning of labor processes, as well as in the labor results evaluation,
- Care about cleanness and tidiness at the workplace. They dispose of all wastes according to the appropriate and legal regulations, as well as on the basis of the ecological necessity of evaluation and processing,
- Take in consideration measures ensuring compliance of relevant quality when planning.

Part V Fields of study

Educational field 1:
A preparation of construction site

Goal:

Pupils plan a preparation of construction site with regard to rational labor processes, regulations focused on safety security and health at work and environmental protection. They learn to distinguish between areas of responsibility in the construction planning, realization and final inspection.
They develop the ability to understand others work and know that the assumption for successfully carried out works is necessary to be mindful of accepting others works as well as of safety due to a various amount of professions.
Take measures serving for the site's preparation and its marking. They are able to read construction plans for the construction site. They should know to mark into site's plans necessary storage and transport surfaces with respect to relevant transport situation and apply them with a help of tables.

Contents:

Professions in the field of Construction
Employers' associations, Employees' societies
Construction plan
Construction Manager, Planning Office, Construction company
Construction Supervisor
Site's preparation and boundaries
Length and right-angled measurement
Wiring and boundaries lengths, size of the site, storage and parking areas
Scales and symbols on the plans
Plans for road signs, wiring and transfers
Basic geometric constructions

Educational field 2:
Opening, access and principles on the construction site

Goal:

Pupils perform ground modifications and adjustment of construction land according to consideration. With regard to the rules for accidents prevention at the construction, they plan trenches and holes making and complete relevant markings. Pupils distinguish, examine and evaluate the soils types and evaluate the water effect. They carry out measurements used for determination and level strengthening of trenches and holes. They choose correct machines for deepening, building-in and soils pressing.
Pupils with respect to the relevant type of soil and the present load construct area foundations and then drew them graphically. They choose relevant type of the construction base as well as its surface, and take into account its drainage for the ability of the access to land.

Contents:

Trenches ensuring, holes securing.
Soil types, soil classes, water effect.
Slope angle, reinforcement types.
Carrying ability, antifreeze bedrock.
Base pillar, ceiling pillar.
Open drainage.
Preparatory construction area, bedrock, unbundled basis, sand and platform floor from artificial stones
Edges hemming
Pipelines types, construction materials
Height measurement in plan view and sections
Lengths, gradients
Areas, volumes, rocks release
Power, voltage

Educational field 3:
Masonry of simple construction body

Goal:

Pupils plan a production of simple construction body from small or middle-formated artificial stone pieces, including openings. They decide on construction materials and reinforcement and binding method. They choose relevant materials to seal up against the soil moisture and develop solutions for their installation. On the basis of support in the process, they create a list of materials. They are mindful of the production of the work equipment with regard to protection of life and health.
Pupils make implementation drawings and determine an amount and material on the base of tables. They use measuring instruments, perform dimensional sketches and produce criteria catalogue for a purpose of evaluation of work results.

Contents:

Wall types and tasks
artificial brick stones, density, pressure resistance, air and thermal isolation
Building lime
Mason's mortar, mortar group
Module system in high-rise buildings
Bricklayers' societies
Working platforms
Sealing materials
The need for building materials
Implementation marking and sketches
Isometry

Educational field 4:
The production of the concrete construction body

Goal:

Pupils plan the production of reinforced concrete construction body and carry out the relevant calculating and graphical construction parts. They construct formwork, as well as supplementary and carrying structures. On the basis of the tables, they determine the concrete composition.
They take into account the preconditions for the participation of reinforced concrete and concrete, as well as operating forces that are in construction body and determine reinforcements.
They compare concrete with other building materials with regard to aesthetics, carrying, durability, demands on repairs and tolerance with environment

Contents:

Types and groups of concrete
Cement, additives
Concrete
Processing and examination of concrete
Reinforced concrete, consistency
Reinforced concrete laths
Experimental models, wooden plates
Wooden and metal laths
Analysis of product lines
Drawings of formwork and reinforcement

Educational field 5:
Production of wooden constructions

Goal:

Pupils construct a wooden construction section after taking into account the corresponding wood choice, joints and joining means. They take into account powers advance in construction section. They elect the processing tools and take decisions to wood protection. They recognize social and ecological forest importance.
Pupils show the joints and wooden structures and provide material needs.

Contents:

Deciduous and coniferous forests, growth, construction
Construction wood
Wood processing, wood moisture
Wood pests, chemical and constructive wood protection
Carpentry and engineering wood joints
Wooden laths, cutting
Nodal points

Educational field 6:
Inspection and overlap of construction parts

Goal:

Pupils plan inspection and overlap of horizontal and vertical construction parts. They assess bedrock, distinguish, evaluate and choose materials specified for inspection, overlap and cover of construction parts. They assess final consequences for constructive construction, with respect to heat tension and humidity. Pupils develop creative thinking.

Contents:

Stucco mortar
Floors and flooring
Building plaster, press material, bedrock
Facings, laying technique
Holes and gaps
Non-drying water
Sealing, sealing materials
Separating and isolating layers
Underlying process, underlying plan
Cuts

Educational field 7:
Masoning of a simple wall

Goal:

Pupils plan production of the wall from large stones. On the basis of the construction-physical and economic aspects, they choose corresponding construction material and relevant shifting technique. They define working processes and determine deployment of machines and equipments.
Pupils calculate the amount of construction material and compare costs between conventional and new fundamental works. They recognize the importance of automatized shifting techniques for development of bricklaying.

Contents:

Large stones
Wall panel
Wall elements
Mounting scaffold
Working and protection scaffolds
Mortar, mortar groups and think-layer mortar
Snub
Cut-outs, slits, templates
Made part
Insulations against non-pressed water
Implementation and detailed drawings

Educational field 8:
Masoning of two-part wall

Goal:

Pupils plan the construction of the exterior walls from artificial mason's stones in compliance of two-part structure. They recognize the constructive and structural-physical differences between simple and two-part the wall and decide on their use on the basis of economic and ecological aspects.
Pupils plan a work process used for the position of the two-part wall and determine the use of machines and equipment. They prepare and read performance plans. They make the accessible amount of construction materials on the basis of drawings and tables, as well as the calculate production cost. They carry out tables and calculations according to the relevant regulations.

Contents:

External and face masonry
Building stone, binding
Isolating material
Back ventilation
Jointing, anchoring
Window inset
Dilative slits
Infixed and additional parts
Plot plan, vertical section
Coordinate sketch

Educational field 9:
Production of solid ceiling

Goal:

Pupils plan the production of solid reinforced concrete ceiling. They compare ceilings types with respect to design, carrying and construction-physical features and their demand for formwork. According to the established purpose of use, they choose the class of concrete hardening and determine the composition of the formwork, as well as needed deployment of machines and equipment. They read, create and evaluate the reinforcement drawing and create work and processes plan for the preparation of concrete. Pupils create representations and find the necessary quantities of concrete and reinforced concrete.

Contents:

Reinforced concrete panel, Panel ceiling
Voltage direction, direction of reinforcement
Pier
Reinforcement
Cut-out, digging, mounted part
Concrete processing.
Decelerator, conveyor
Network of concrete reinforcement, a bar concrete steel
Protection against falling, scaffold
Reinforcement plan, steel lath
Cover cut

Educational field 10:
Wall plaster

Goal:

Pupils assess the base under the plaster and put new plaster with respect to the construction-physical requirements. They choose the relevant building material. They plan work process including the pre-prepare works and decide on the deployment of equipment. At the same time, they calculate the need for building materials.

Contents:

Internal and external plaster
Groups of stucco plaster
Machine plaster, plaster systems
Thermal isolated plaster
Plastering machine
A basis of plaster
Slit
Need of stucco plaster
Mixing ratio
Coordinate sketch

Educational field 11:
Construction of a wall using a dry building method

Goal:

Students plan the first structure for the simplest wall, choose building material for the formwork, and determine means of reinforcement. Along with it, they describe the course of the assembly and choose the tools application. Based on the demonstration and planning templates, they perform quantitative calculations using tables.

Contents:

Metal sections
Plaster board, gypsum fibre board
Ceiling, junction
Joints forming
Wall section

Educational field 12:
Floor construction

Goal:

Students plan construction of a floating floor. They define a multilayer structure as well as a joints layout and choose appropriate building material. They define the construction process including preparatory and additional works. Students develop mixing calculations and define quantities of building materials.

Contents:

Foundations
Identification of heights
Types of compounds
Gravity and smoothing compounds
Separation layer
Sheeting material
Insulation material
Dilatation joint
Reinforcement
Wall form detail

Educational field 13:
Production of direct stairs

Goal:

Pupils plan the production of direct stairs. They care while planning regulations and take into account the direction of walking, building materials, location and construction.
After taking into account the aspect of safety, they choose the form of single steps and type of substrate. They calculate the number and slope of steps taken after the different structure of the floor and show them graphically.

Contents:

Forms of stairs
Marking of stairs
Principal dimensions
massive stairs, panel stairs, brick stairs
External and internal stairs
The direction of the clamping
Form of the single steps, stair ground
The rule of the width of the foot
Length of barrel
The degree of opening of the stairs
high of passage
The floor plan, the cross-section of the staircase (side view)

Educational field 14:
Overlap of the opening through the arch

Goal:

Pupils plan the production of the brick segment arc. They take decisions related to the use of the construction material, and they deduce a way of forming a supporting pillar on the basis of the power movement in the arc structure.
Pupils show the arc and do the calculation. They establish work processes related to the fabrication and construction of the formwork of arch, as well as his bricking.

Contents:

Types of arches
Part of the arches
Centering
The number of layers, joints sealing
Arch construction
Illustration

Educational field 15:
The production of the walls of natural stone

Goal:

Pupils create possibilities for the construction of the wall from the natural stone with holes and decide on the way its performance. They take into account and incorporate structural and work-technical aspects, also creative and ecological considerations.
Pupils plan the work procedures and make detailed sketches.

Contents:

Natural stones
Ways of bricklayer's work, face wall
Implementing rules
Slits
Overlays

Educational field 16:
Masonry of strange construction parts

Goal:

Pupils apply masonry rules for pillars and sloping brick corners and linings. They show the braces and connections and perform calculations of the necessary amount.
Pupils get to know production possibilities of chimneys from cast parts. They plan a chimney with a ventilation shaft and illustrate it. With respect to structural-physical influences, they form design and processing rules.
Pupils plan sealing of the construction part against water and take into account the rules of the drainage.

Contents:

Sliming, assess of the tension
acute-angled and strut corner
Concrete and reinforced concrete skeleton, Wood product
Slits
Forming stones
Isolating materials
Cleaning holes
Roof, floor and wall hole
Chimney head
Black bath tub, white bath tub
Connection

Educational field 17:
Maintenance and restoration of construction parts

Goal:

Pupils plan maintenance, sanation of the exterior walls. They recognize the causes of the damage and processed measures for avoiding the damage, and security. They are mindful on construction-physical requirements and preconditions, and choose relevant construction materials. They develop their understanding for careful handling with contained construction material. They inform about building styles and their construction strangeness.
Pupils create coordinate and stative sketches.

Contents:

Determination of the damages
Support, Underpinning
Heat protection
Drying and drainage
Concrete sanation
Bricklayer's parts sanation
Recycling of building material