

***NEW DEMANDS FOR THE
ENGINEERING EDUCATION
OF CIVIL ENGINEERS
IN BULGARIA***

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1. INTRODUCTION

In our history as a first civil engineer and builder is known **Kolyo Fichev (Ficheto)** (1800 - 1881) – man, who build many interesting buildings, churches and bridges.



After the liberation of Bulgaria from the Turkish servitude from 1886 up to 1942 from the European countries to build the new Bulgaria have came 568

civil engineers. The first of them is **eng. Lukan**

Hashnov (1862 - 1917) he was the first civil

engineer, member of BAS.

Introduction

After the liberation of Bulgaria from the Turkish In 1942 in Bulgaria has been opened Higher technical school, which was the base for the new Polytechnical University in Sofia (1947) and gave starts of civil engineering education. Starting from that time in Bulgaria have finished their engineering education more than 15000 civil engineers. They are working with success in Bulgaria and in many other countries. Their works can be seen in Bulgaria, Europe, Asia, Africa and America. Some of these works became now the architectural monuments.

2. CIVIL ENGINEERING UNIVERSITIES AND HIGHER SCHOOL IN OUR DAYS

University of Architecture, Civil Engineering and Geodesy (UACG, 1954) is a state one. UACEG has 3 Faculties offering education in the field of engineering:



- Faculty of civil engineering, which provides education in “Construction of buildings and facilities in Bulgarian and English language. This Faculty has reach history - as the first Faculty in Bulgaria far the education of engineers.
- Faculty of transport construction, which manages education in homonymous specialty.
- In Hydrotechnical Faculty are studied all specialists, related with the water, water constructions and purification.

University of Architecture, Civil Engineering and Geodesy (UACEG)



Faculty of civil engineering is dedicated to the education of masters (5 years) in:

- Construction engineering – MA for bachelors to be prepared for the project designer.
- Reconstruction and modernization of buildings – MA for bachelors.
- Investigation and design of building construction – also for BA. This program is used in co – operation with City University (London) and Chalmers University (Goteborg).

UACEG has 4600 students and – in the Faculty of CE they are – 1600.

Luben Karavelov Higher School (Sofia) - VSU



VSU is a state higher school, which is a successor of the specialized military civil engineering school, created 1938.

VSU's Faculty of civil engineering offers education in all educational – qualification degree:

- bachelor (4 years) with professional qualification “Construction of buildings and facilities”
- master after bachelor (1,5 years) with professional qualification “civil engineer - constructor”

This Faculty has about 800 students.

VSU has his institutional accreditation from NAEA for 6 years and program accreditation of the specialties.

VSU's Faculty of Architecture provides education in speciality “Engineer – architect” (4 years)

Varna Free University

“Chernorisets Hrabar” (VFU, 1986)



VFU is a private University. In this University education for the speciality “Construction of buildings and facilities” is with the programs for master in:

- Building constructions, provided in Bulgarian and Russian language
- Water and sewerage
- Road construction, provided in Bulgarian and Russian language.

VFU for these specialties has two forms – regular (115 students) and extramural (380 students) studies.

In the last group are students working in building companies and studying in the University.

VFU has a branch in Smolyan (town in the mountain Rodope). VFU is working using ISO 9001: 2008 and has two certificates: UKAC (GUB) and ANAB (USA).



European University Polytechnical (Pernik)

EPU is a private University in which education is provided in English language.

The European Polytechnical University is a multinational centre of interaction between contemporary tuition, scientific research activities and innovation and academic and business co-operation.

The University personalizes the relationship with its students, complies with their individual preferences and prepares them for professional realization in the market environment of the dynamically changing world.

The students in the speciality of civil engineering are from foreign countries.

European University Polytechnical (Pernik)

EPU follows a sustainable development philosophy and its values are:

- ✓ European traditions and standards harmonization with American higher education pragmatism;
- ✓ Education internationalization by attracting tutors from leading foreign Universities (for CE program – from University of Ulster – GB);
- ✓ One – semester training of students in partnering Universities in Europe.
- ✓ Training one month in building company.

European University Polytechnical (Pernik)

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EPU offers Master's programs (1,5 years after bachelor):

- Master of renovation of buildings and facilities;
- Master of earthquake engineering;

EPU has about 140 students in the Program of Civil engineering.

Anguel Kanchev Ruce University

This from 2014 opened the new speciality - **civil engineering** – bachelor. They have at first year only 30 students.



3. REALIZATION OF YOUNG ENGINEERS

Graduated in “Civil Engineering”
are qualified to make a career as:

- Process engineers and marketing professionals; technical supervisors, consultants and managers in the state owned and private companies, construction and business companies, public and international institutions;
- Manager of repair works, operation and maintenance of buildings and facilities;
- Experts in monitoring bodies, international organizations in the field of construction; consultancy companies; in the field of real estate trade and teachers in vocational architecture and building high schools.

Table 1

University	% of employed graduated students
UACG	88
VSU	50
VFU	95
EPU	70

Which are the needs of practice:

- More practical experience of the graduate students;
- To increase entrepreneurial knowledge of students;
- Update the study programs to business requirements.
- To prepare them for lifelong learning;
- More to be involved in research, innovations and other type of creative activities.

4. FUTURE OF CIVIL ENGINEERING



An ever – increased global population that is shifting even more the urban areas will require widespread adaptation and sustainability. Demand for energy, transportation, drinking water, clean air, and safe waste disposal will drive environmental protection and infrastructure development. Society will face threats from natural events, accidents, and perhaps such other causes as terrorism.

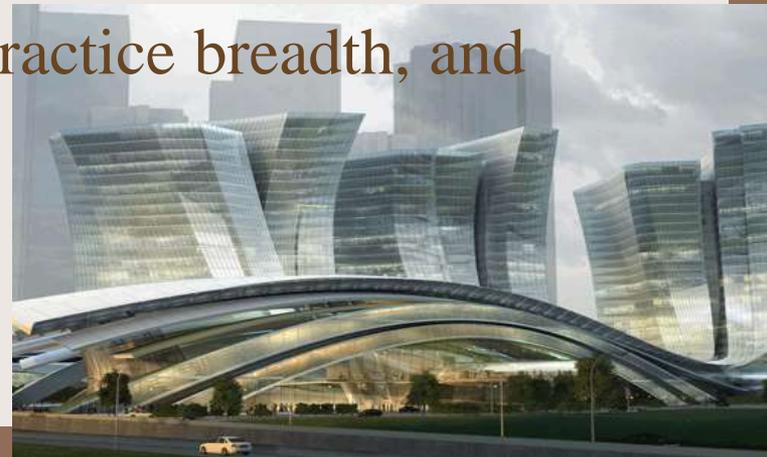
For these changes the global vision developed to see civil engineer entrusted by the society to lead in creating a sustainable world and enhancing the global quality of life for 2025 is:

Entrusted by society to create a sustainable world and enhance the global quality of life, civil engineer serve competently, collaboratively and ethically as specialist:

- *Planners, designers, constructors, and operators of society's economic and social engine, the built environment;*
- *Stewards of natural environment and its resources;*
- *Innovators and integrators of ideas and technology across the public, private, and academic sectors;*
- *Managers of risk and uncertainty caused by natural events, and other threats, and*
- *Leaders in discussions and decision shaping public environmental and infrastructural policy.*

Relative to today's approach, tomorrow's civil engineer – prior to entry in to practice of civil engineering at the professional level – will:

- Master more mathematics, natural sciences, and engineering fundamentals;
- Maintain technical breadth;
- Acquire broader exposure to humanities and social sciences;
- Gain additional professional practice breadth, and
- Achieve greater technical dept - that is, specialization.



New demands for the education

To implement above enumerate changes in engineering profession we must prepare the students and the engineers in practice:

- With the new paradigm of “**sustainable construction**” which include :
 - To build new class of constructions (**green, intelligent, high performance buildings and facilities**), using **green materials** – with low energy consumption during production, high mechanical resistance and durability, as well as to use

New demands for education

- With the Directive 2010/30/EU encouraging the use of energy from renewables and low energy consumption products;

- With the Directive 2010/31/EU in it EU encourages the improvement of the energy performance of new and old buildings.

According this Directive we must use the new **NZEB** technology. The Directive determines that in 2018 all public buildings have to be NZEB and in 2020 – all new buildings must be NZEB.

THANKS FOR YOUR ATTENTION !

