



ANDIJON MASHINASOZLIK
INSTITUTI

**Yangi O‘zbekistonda
islohotlarni amalga
oshirishda zamonaviy
axborot-kommunikatsiya
texnologiyalaridan foydalanish**

I-II SHO‘BA



O'ZBEKISTON RESPUBLIKASI OLIY VA O'RTA MAXSUS
TA'LIM VAZIRLIGI
ANDIJON MASHINASOZLIK INSTITUTI

**«YANGI O'ZBEKISTONDA ISLOHOTLARNI AMALGA OSHIRISHDA
ZAMONAVIY AXBOROT-KOMMUNIKATSIYA
TEXNOLOGIYALARIDAN FOYDALANISH»** mavzusidagi
Xalqaro ilmiy-amaliy konferentsiyani
ILMIY MAQOLALAR TO'PLAMI
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Andijon, O'zbekiston

МИНИСТЕРСТВО ВЫСШЕГО И СРЕДНЕГО СПЕЦИАЛЬНОГО
ОБРАЗОВАНИЯ РЕСПУБЛИКИ УЗБЕКИСТАН
АНДИЖАНСКИЙ МАШИНОСТРОИТЕЛЬНЫЙ ИНСТИТУТ

СБОРНИК НАУЧНЫХ СТАТЕЙ
Международной научно-практической конференции по теме
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КОММУНИКАЦИОННЫХ ТЕХНОЛОГИЙ В ПРОВЕДЕНИИ РЕФОРМ
В НОВОМ УЗБЕКИСТАНЕ»**
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Konferentsiya ilmiy maqolalari iqtisodiyotning real va ijtimoiy sektorini rivojlantirish bilan bog'liq institutlar va ilmiy izlanishlar olib borayotgan professor-o'qituvchilar, ilmiy xodim-izlanuvchilar va magistrantlar hamda talabalar uchun mo'ljallangan.

Mazkur to'plamga kiritilgan materiallarning mazmuni, undagi statistik ma'lumotlar va me'yoriy hujjatlar sanasining to'g'riligiga hamda tanqidiy fikr-mulohazalarga mualliflarning o'zlari mas'uldirlar.

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ANDIJON MASHINASOZLIK INSTITUTIDA
O'TKAZILGAN
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AMALGA OSHIRISHDA ZAMONAVIY
AXBOROT-KOMMUNIKATSIYA
TEXNOLOGIYALARIDAN FOYDALANISH»
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TEXNOLOGIYALAR

To'plam «YANGI O'ZBEKISTONDA ISLOHOTLARNI AMALGA OSHIRISHDA ZAMONAVIY AXBOROT-KOMMUNIKATSIYA TEXNOLOGIYALARIDAN FOYDALANISH» Xalqaro ilmiy-amaliy anjumanida ishtirok etgan olimlar, ilmiy izlanuvchilar, professor-o'qituvchilar va talabalarning ilmiy izlanishlaridan iborat. Ilmiy-texnik konferentsiya Andijonda 2021-yil 27-29-oktabrda bo'lib o'tgan.

management decided to produce PPE Kits, which are still high in demand due to the ongoing deteriorating situation of the pandemic. This was an opportunity for the management, before January 2020 the PPE Kits that were available in India were being imported from china at very high costs and poor quality. The Management employed 10,000 workers at their Silvasa Palnt just focused on Manufacturing PPE Kits. The Share Prices of the company has seen a sudden jump within a very short period, there was an upper circuit also imposed by the Market Regulator. At present the Share Price is at an average 20 Rs per share. The company is indeed in better health despite all the unfavorable circumstances in the economy.

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Data Collection

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ANALYSIS AND COMPARISON OF MECHATRONICS TEACHING SYSTEMS IN EU AND UZBEKISTAN: TOWARDS THE DEVELOPMENT OF A BACHELOR DEGREE IN UZBEKISTAN THROUGH INNOVATIVE IDEAS AND DIGITAL TECHNOLOGY

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Abstract

This paper aims to present some of the main findings of the work package one (WP1) of the “Modernization of Mechatronics and Robotics for Bachelor degree in Uzbekistan through Innovative Ideas and Digital Technology

(MechaUz)” Erasmus+KA2 project (2020-2022). The work package aimed, primarily, to implement an analysis and comparison of mechatronics teaching systems and methods in HEIs of EU and Uzbekistan, at both undergraduate and graduate level.

1. Introduction

Mechatronics has been identified as an interdisciplinary field. The main characteristic in mechatronics is the synergism and integration of mechanical engineering, computers, control systems and electronics in the design process (Craig and Stoffi, 2002).

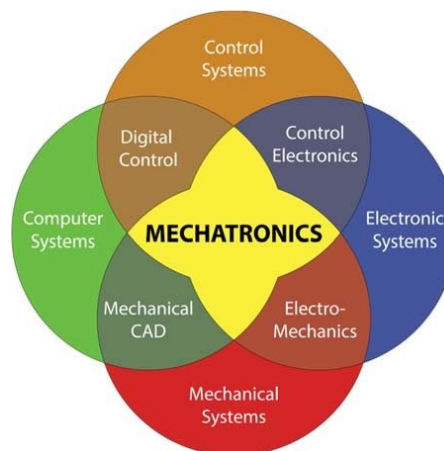


Figure 1: Mechatronics synergism and integration in the design (Craig and Stoffi, 2002).

It has been defined as “an intelligent and unifying paradigm, that offers an area of interdisciplinary knowledge and interactions regarding ways of working and thinking, practical experiences, as well as theoretical knowledge” (Maki et al., 2013; Liliana and Florina, 2015). There is no unique definition of Mechatronics, based on the findings of WP1. As a result, different Mechatronics degree programmes, at both the bachelor and master degree level, present their own perspective of Mechatronics. A mechatronics definitions, based on the findings of WP1, follows.

“Mechatronics is a fusion of mechanical, electrical and control engineering. In order to compete successfully in a global market, modern manufacturing companies must have the ability to integrate electronics, control, software and mechanical engineering into a range of innovative products and systems. Graduates of this programme will have this interdisciplinary knowledge, skill and approach to engineering.” (BEng Mechatronics, School of Engineering, University of Glasgow (UK)).

An analysis and comparison of mechatronics teaching systems and methods in HEIs of EU and Uzbekistan, at both undergraduate and graduate level was implemented in WP1 of the MechaUz project. Furthermore, the studying experience of the EU MechaUz partners in the implementation of standards, curriculum and teaching materials in the field of Mechatronics was investigated and identified.

Finally, a list of good practice examples, based on the studying experience of the EU partners, was compiled.

2. Methodology

A template (MechaUZ - Working Template for WP1) was used by the MechaUZ Partners for filling out information required for the completion of the relevant tasks 1 in WP1. The collected information has been included in appendix B. The template was introduced by the MechaUz coordinator and WP1 leader, the International Hellenic University (IHU).

The template was divided into Part A and Part B. Part A involved the analysis and comparison of mechatronics teaching systems and methods in HEIs of EU and Uzbekistan.

Data on Part A included bachelor and/or master degrees in Mechatronics for EU and Uzbekistan. The programmes listed for each country of interest should cover the essential information about the corresponding teaching systems in the respective countries and therefore the provided list of relevant degree programmes should not be exhaustive. Information in Part A included (for each identified bachelor/master degree programme): programme title; department; University; Country; URL; degree of study programme; ECTS; duration (in years); language; bachelor project; teaching methodology (Theory, lab sessions, development of projects, connection with industry, seminars, other); course-specific learning aims/outcomes/competences; the structure of the programme; profile of the programme (distribution of the course subjects); and any further comments (such as collaboration with industry, industrial experience, etc.).

Information in Part B included a list of good practice examples. Partners were asked to provide their own studying in the implementation of standards, curriculum and teaching materials in the field of Mechatronics. They could also list URL addresses.

3. WP1 Results – Discussion

Detailed results and relevant discussion have been included in the report of WP1 of the MechaUz project.

3.1 Mechatronics and Mechatronics related programme titles at a bachelor degree level

In total, 50 bachelor degree programmes from 24 countries were identified, in EU and UK. Degree programmes in EU and UK include Mechatronics, Mechatronics Engineering, combined degrees such as Mechatronics and Robotics, Mechatronics and Business Management and Automotive Mechatronics.

Other degree programmes include Automation Engineering, Automation and Control Engineering, Informatics: Robotics and Intelligent Systems, Automotive Engineering, Mechanical and Manufacturing Engineering, Production Engineering and Management and Industrial Engineering and Management.

In Uzbekistan, degree programmes include Mechatronics and Robotics and Computer Engineering.

3.2 Mechatronics and Mechatronics related programme titles at a master degree level

29 master degree programmes from 14 countries were identified, in EU and UK. Degree programmes in EU and UK include Mechatronics, Mechatronics Engineering and combined degrees such as Mechatronics and Robotic Engineering, Mechatronic systems for Industry and Medicine, Control for Green Mechatronics, Mechatronic systems and advanced mechanics and Mechatronics and Business Management.

Other degree programmes include Informatics: Robotics and Intelligent Systems, Automation and Control Engineering, Automation Systems, Robotics and Automation Engineering, Strategic Product Design, Manufacturing and Welding Engineering Design and Mechanical and Manufacturing Engineering.

In Uzbekistan, master degree programmes include Mechatronic Engineering (Control Technologies for Industries 4.0) and Mechatronics and Robotics.

3.3 Programme duration

The duration of the bachelor degree programmes in Mechatronics or related degrees in EU, UK and Uzbekistan varies between 3-5 years. Specifically, 16 bachelor degree programmes have a duration of 4 years (34.8%), 22 programmes have a duration of 3 years (47.8%), 4 programmes have a duration of 3.5 years (8.7%) and 4 programmes have a duration of 5 years (8.7%).

3.4 Teaching methodology

Teaching methodology includes different combinations of lectures, laboratory classes, individual and group projects, connection with industry, internships and tutorials. Laboratory work is integrated in all bachelor degree programmes. High tech laboratories are highlighted in some degree programmes.

3.5 The course profiles by subjects

For each identified course at a bachelor degree programme, the course profile was described in a Table which included the main fields of study. The results varied among different countries. Detailed results have been included in the WP1 report of the MechaUz project. Indicative results from bachelor degree programs in France and Portugal follow.

France	
Subject	Percentage of the total course modules
Mechanical Engineering	9-19%
Electrical/Electronic Engineering	9-15%
Computer Science/ ICT	0-7%
Mechatronics	22-49%
Fundamental subjects	21-51%

Portugal	
Subject	Percentage of the total course modules
Mechanical Engineering	17-20%
Electrical/Electronic Engineering	30-32%

Computer Science/ ICT	10-19%
Mechatronics	8-17%
Fundamental subjects	14-32%

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ИССЛЕДОВАНИЕ УСОВЕРШЕНСТВОВАННОЙ МАТЕМАТИЧЕСКОЙ МОДЕЛИ ВИБРАЦИОННОГО ПРИВОДА *О.В. Березюк, к.т.н., доцент, Винницкий национальный технический университет, Украина*

В Украине каждый год образуется около 53 млн. м³ твердых бытовых отходов (ТБО), что угрожает здравоохранению и безопасности окружающей среды [1]. В отличие от промышленных отходов [2-6], ТБО характеризуются большой неоднородностью, усложняющей их переработку. Сбор ТБО является основной задачей санитарного очищения населенных пунктов и осуществляется более чем 4100 мусоровозами [7], а потому связан со значительными финансовыми затратами. Согласно Постановлению Кабинета Министров Украины № 265 [8], важным является обеспечение применения в коммунальном хозяйстве страны современных высокоэффективных мусоровозов, как основного звена в структуре машин для сбора и предварительной переработки ТБО.

На рис. 1 показана расчетная схема вибрационного привода доуплотнения ТБО в мусоровозе с использованием генератора импульсов давления релейного дифференциального действия (ГИДРДД). На схеме представлены такие основные геометрические, кинематические и силовые параметры: p_1, p_2, p_3, p_4 – давления соответственно на выходе насоса, на входе гидроцилиндра, на выходе гидроцилиндра и на входе фильтра; W_1, W_2, W_3, W_4 – объемы трубопроводов между насосом и гидрораспределителем, гидрораспределителем и входом гидроцилиндра, выходом гидроцилиндра и гидрораспределителем, гидрораспределителем и фильтром; Q_H – фактическая подача насоса; S_P – площадь условного прохода отверстия распределителя; S_ϕ – площадь поверхности фильтровального элемента; D, d – диаметры поршня и штока; G_n – вес плиты прессования; $G_{\text{ц}}$ – вес гидроцилиндра; G_{B1} – вес части

РАЗРАБОТКА АВТОМАТИЗИРОВАННОЙ СИСТЕМЫ ВЫБОРА ФРЕЗЕРНОГО ИНСТРУМЕНТА ДЛЯ СНИЖЕНИЯ СЕБЕСТОИМОСТИ ИЗГОТОВЛЕНИЯ ДЕТАЛЕЙ В ПРОИЗВОДСТВЕ.....	25
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