ISSN : 2466-0744

MULTIDISCIPLINE PROCEEDINGS OF

DIGITAL FASHION CONFERENCE

KOREA, REPUBLIC OF

Multidiscipline Proceedings of

DIGITAL FASHION CONFERENCE

September 2023 *(Volume 3, No.5)*

Available at digitalfashionsociety.org
Published:
서울 합정역
파주출판도시
ISSN 2466-0744
Seoul
Korea, Rebuplic of

EDITORIAL BOARD

ORGANIZING THE CLASSES OF MICROCONTROLLER SYSTEMS AT SCHOOLS

Abaskhanova Khalima Yunusovna
Tashkent University of Information Technologies named after Muhammad al- al-Khwarizmi
halimaabasxanova@gmail.com

Abstract: The main tasks of the circles are to teach the basics of computer programming, information technologies, mastering programming languages, and creating control devices.
Key words: Microcontroller, programming languages, schematic diagram

Implementation of five initiatives, which include comprehensive measures aimed at creating additional conditions for youth education in our country, further development of youth talent, training of highly qualified personnel, and ensuring their active participation in the development of the country is considered one of the priority tasks of today.

In accordance with the decision of the President of the Republic of Uzbekistan dated September 5, 2018 "On measures to introduce new principles of management into the public education system" No. , continuous development of circles in mechatronics, engineering and computer software directions is defined.

When designing control devices based on a microcontroller (MK), the student will have the following knowledge:

Acquisition of electronics and schematic engineering knowledge; familiarization with schematic and technical devices during the design process and creation of a principle scheme; study of column, panel, exchange-type elements, microcontrollers using a constructive approach; familiarization with programming technology and creating software; mastering programming languages; creating software-controlled devices; technological approach is the hierarchical level of determining the principle scheme of the technological process, that is, the sequence and composition of the stages of its preparation, the development of the directions of technological processes, that is, the determination of the content and the sequence of operations, the selection of bases and groups of technological devices, the design of technological operations.

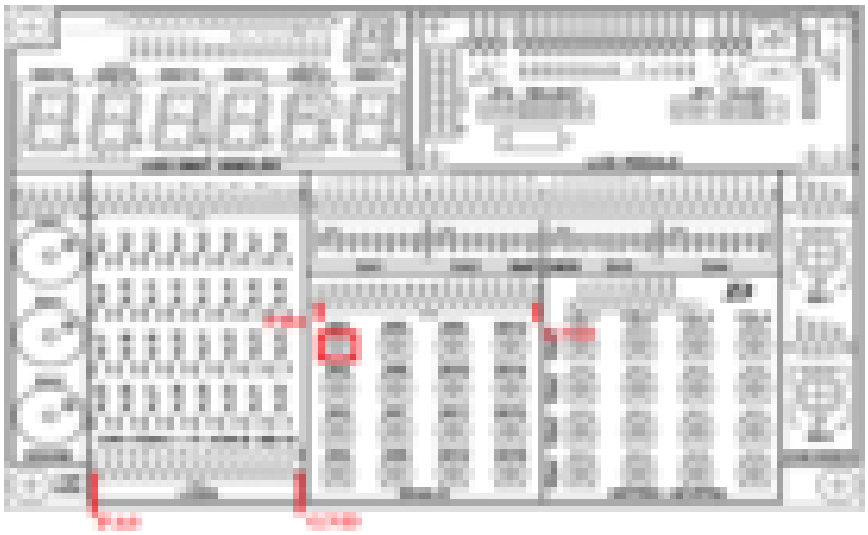

Figure 1. Testing board.

There are numerous issues with the conventional approach to teaching microcontroller

courses. According to Schultz (1991), a large portion of instruction in such a setting is based on the target device's architecture and assembly language instruction. Pupils learn the mnemonics for assembly language and how to utilize them in very basic applications, like performing basic mathematical operations or manipulating bits.They might get the chance toward the conclusion of the semester to either create straightforward programs utilizing the software simulators or the target microcontroller hardware. The majority of applications will be quite straightforward, such as responding to pushbutton switches or flashing some LEDs linked to the microcontroller's output ports.

Most engineering teaching laboratories make use of microcontroller development boards (or kits). While many schools opt to buy development boards that have already been developed and include integrated device programmers, LEDs, LCDs, GLCDs, switches, buzzers, and other components, some institutions design and construct their own development boards. The benefit of using a ready-made development board is that the board has already undergone testing by the manufacturer, thus all that is needed from the pupils is software development to control the different devices built into or externally attached to the board. According to Hamrita and McLendon (1997), the suggested method in this study is based on using the microcontroller as a design tool, with an emphasis on using it to address real-world engineering challenges. In place of pure theory, the course is structured around application. Instead than concentrating on the specifics of the microcontroller architecture and assembly language instructions, more specifically, the emphasis is on using the microcontroller as a tool to solve an engineering problem. There are many different companies producing a wide variety of microcontroller products, numbering in the hundreds. These microcontrollers typically differ in terms of their architecture and assembly language instructions. When confronted with a different microcontroller in the workplace, pupils who have studied the specifics of one design may find it challenging to use it. To familiarize them with these many architectures, it will be helpful to explain the very fundamental architecture of as many microcontrollers as possible. However, this practice should only take a short amount of time.

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