

## MODULAR TEACHING TECHNOLOGY IN TECHNICAL SCIENCES APPLICATION METHODOLOGY

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**Annotatsiya:** Ushbu maqolada kasb-hunar kollejlarda texnik fanlardan dars berishda moddiy hukumat texnologiyalarini amalga oshirish va samaradorligini oshirish bo'yicha ish olib borildi.

**Kalit so'zlar:** modul, ko'nikma, o'qitish, modulli o'qitish, o'qish elementi, moddiy o'qish, o'qish dasturi.

**Аннотация:** В данной докладе основное внимание уделяется использованию модульных технологий обучения при преподавании технических предметов в профессиональных колледжах для повышения эффективности обучения и облегчения освоения предметов студентами.

**Ключевые слова:** модуль, умение, обучение, модульное обучение, элемент обучения, модульное обучение, учебная программа.

**Annotation:** This article focuses on the use of modular teaching technologies in the teaching of technical subjects in vocational colleges to increase the effectiveness of training and facilitate the mastery of subjects by students.

**Keywords:** module, skill, training, modular training, learning element, modular training, curriculum.

### INTRODUCTION

Modular learning is one of the most promising systems of learning because it is best adapted to the assimilation system of the human brain. The basis of modular training is based on the modular organization of human brain tissue. It will consist of the following (Figure 1).

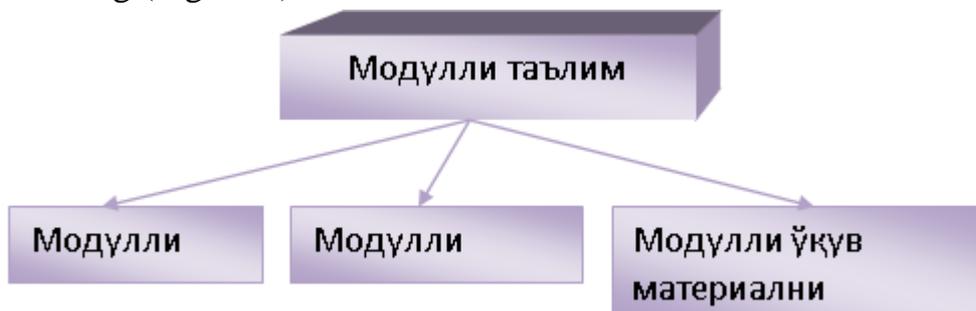


Figure 1. Modular training structure.

As one of the promising systems of teaching, the main learning objectives in modular learning technologies include: the student's ability to work at their own pace, to determine their own capabilities, variable construction of educational content, integration of its various types and forms, to form in students the skills of independent learning and to achieve their high level of results.

### **REFERENCES AND METHODS**

The objective method of scientific knowledge was used in the research process. An objective analysis of the methods of application of modular teaching technology in technical sciences was conducted. The period of development of pedagogical technologies was analyzed from the point of view of history. N.Avliyokulov's book "Modern teaching technologies" was studied in terms of logical sequence.

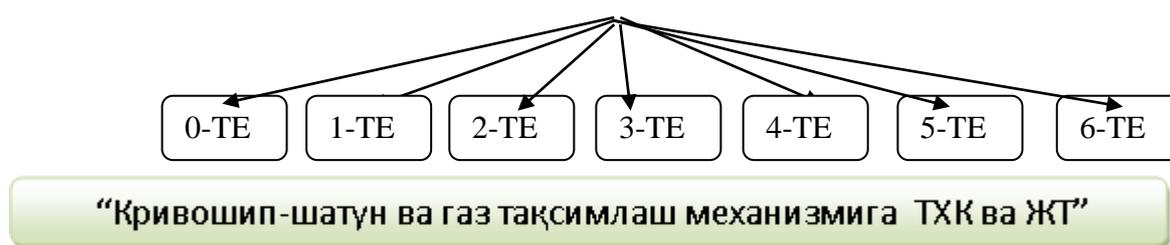
### **DISCUSSION AND RESULTS**

It is self-evident that the last of the goals outlined above is the main, leading goal of modular learning.

To achieve these goals, modular learning technology needs to be integrated into a specific system. To do this, you need to create a modular program.

In turn, the modular program will consist of training modules, and training modules will consist of training elements (TE). A learning element is an organizational-content unit that serves to convey a specific technical concept or process to students. Each learning element concludes with control questions.

As an example, the division of the training module "Training and JT for the mechanism of curvature and gas distribution" into training elements can be described as follows (Figure 2):



**Figure 2. Distribution of training elements of the module**

(0-TE – initial control);

1-TE – The purpose of the module “Maintenance and Current Repair of Krishovip-shatun and gas distribution mechanism”;

2-TE – Faults in the Krishovip-shatun mechanism;

3-TE – Maintenance and Current Repair of the Krishovip-shatun mechanism;

4-TE – Faults in the gas distribution mechanism;

- 5-TE – Gas Distribution Mechanical Maintenance and Current Repair;
- 6-TE – Final control.

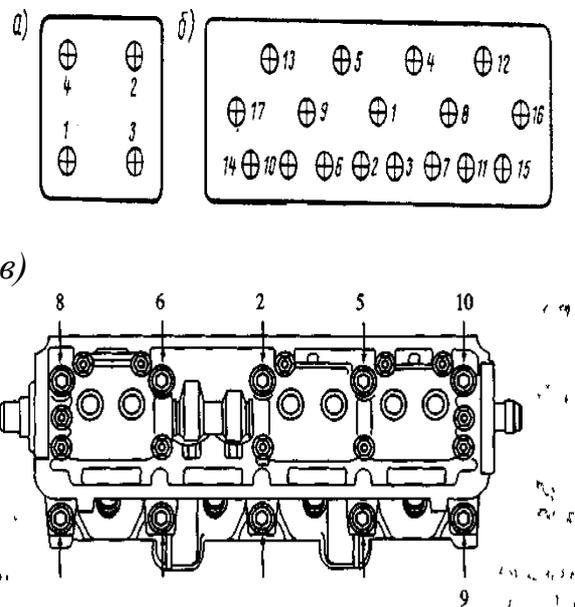
The essence of modular education is that when a student works with a module, the specific goals of the learning activity are achieved independently (or with some help from the teacher). Modular training provides an opportunity to comprehensively address modern issues of vocational education. To do this, modular learning technology can be developed in an optimized and simple form as follows:

<b>Learning element</b>	<b>Learning material showing the goals and assignments given to students</b>	<b>Review for students</b>
0-TE	<p><b>the purpose of the training module 0-TE:</b> Students' knowledge of RKSH and GDM is monitored. The structure and working principle of the mechanism are briefly repeated.</p>	Textbook and Sources: [1] - Chairman of the textbook, Chapter 2, Topic 2.2.
1-TE	<p><b>the purpose of the training module 1-TE:</b> RKSH and GDM i faults will be studied and ways to overcome them will be revealed. <i>Problematic question:</i> What are the external signs of KSHM malfunctions?</p>	[2]- see pages 53-67 of the textbook.
2-TE	<p><b>Following the recommended learning elements, assignments, and guidelines in this learning module, students should be able to:</b> 1. Gain an understanding of the problems that occur in RKSH: The main faults of GDM are cylinders, piston rings and grooves, walls and holes in the piston bore, wear of the connecting rod head bushings, inserts in the crankshaft necks, and drying of the piston rings.</p>	[3]- Learn more from the literature.
3-TE	<p><b>Maintenance and Current Repair of the Krishovip-shatun mechanism</b> In order to prevent engine damage and malfunctions, complex preventive measures are taken at transport enterprises. This work is diagnostic, Professional Service; Fixing, diagnostics, adjustment and lubrication of the engine during the 1st Maintenance, 2nd Maintenance</p>	Understand the types and order of maintenance.

and Domestic Service period.

The purpose of the fastening work is to check the tightness of the engine connections (engine frame support, cylinder head and crankcase to the cylinder block, etc.).

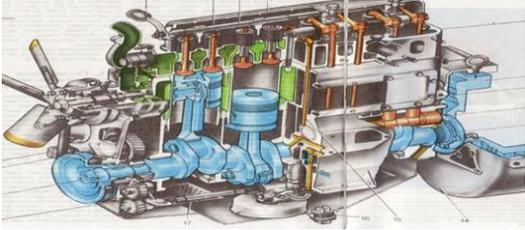
This task is performed in the sequence specified in the instructions of the car manufacturer (Figure 3), as well as at the moment of normal turning using a dynamometer wrench, a set of auto-locking tools.

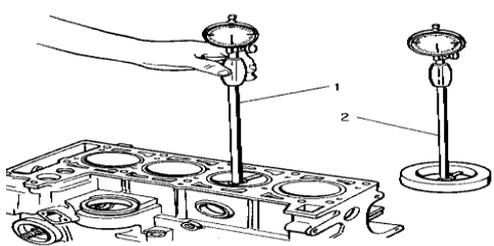


**3-picture.** Kamaz-740 (a), ZIL-130 (b) and Nexia (e) the sequence of tightening the cylinder head nuts of the engines.

**Maintenance:** The most basic and important work in the current repair of the engine is: piston rings, pistons, replacement of piston fingers, core and connecting rod inserts (according to repair dimensions), block seal, grinding the valve saddle, then wiping with a special mixture, washing and cleaning the oil passages with special solutions, cleaning or replacing the reduction valve, and so on.

**Assignment:** Which mechanism is highlighted in the picture below?

	<p><b>4- picture.</b></p> 	
<p>4-TE</p>	<p><b>Following the recommended learning elements, assignments, and guidelines in this learning module, students should be able to:</b></p> <p>The main faults of the GDM include wear of the propeller and its bushings, valve plates and seats, gears, gas distribution shaft support necks and shafts, and cracks in the gap between the valve and the choke.</p> <p>Noisy operation of the gas distribution mechanism, flame from the carburetor and noise from the smoke extinguisher are signs of failure.</p> <p><b><i>Problematic question: Can a car move if one of the valves is not working (broken)?</i></b></p>	
<p>5-TE</p>	<p><b>Gas Distribution Mechanical Maintenance and Current Repair</b></p> <p>In order to prevent engine damage and malfunctions, complex preventive measures are taken at transport enterprises. These include Diagnostics, Professional Services; 1 is Maintenance, 2 is Maintenance, Diagnostics, Adjustment and Lubrication of the Engine during Maintenance and Domestic Service.</p> <p>During the service period, the main focus is on fastening and adjustment work.</p> <p>In engines, the adjustment work on the GDM consists of adjusting the gap between the pusher or crankcase with the upper part of the valve stem, tightening the connection of the engine support to the</p>	

	<p>frame, tightening the cylinder head and crankcase together with the cylinder block.</p>  <p><b>5- picture.</b> Determining the degree of wear of cylinders using a nutrometer. 1-nutrometer; 2 colibri of extraction of metromerin by means.</p> <p>As a result of the wear of the sleeves, the dimensions differ from the norm, while the wear is uneven along the diameter of the sleeves, in this case they are brought to the next dimensions by mechanical action (rastochka) and the piston and its rings are selected and installed in accordance with the new size group of the sleeve.</p> <p><i>Assignment: Name the following details and can they be restored to workability?</i></p>  <p><b>6- picture.</b></p>	
6-TE	<b>Final control</b>	The suggested tests are solved.

Modular learning has been found to be an important factor in improving educational content. It was shown that in the modular teaching of the subject “Maintenance and repair of cars and engines”, the modular approach leads to the full mastery of the material on the basis of educational objectives, educational content, educational activities. A modular technology-based approach to the learning process

allows students to fully master the learning material, which has shown that the technology is promising in the future in independent and distance learning.

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