Name of subject	Introduction to the Specialty (ECTS 4)
Subject/module code	YK 2304
Science taught semester (s).	3rd semester
Responsible teacher	Musayev Sh., PhD, Associate Professor; Karimov Y., Assistant, "Engineering Communications" Department
Education language	Uzbek
Connection to the curriculum	Elective
Training hours (this including independent education)	**Total hours – 120.** **Audience training hours – 48.** Lecture training hours – 24 Practical training hours – 24 **Independent education – 72 hours**
ECTS	4
The purpose and tasks of subject / learning outcomes	**The purpose of teaching the course –** to form in students studying in the construction field of higher education institutions an understanding of engineering communication systems and of the role of the course in production. **The task of the course is** to teach students how to improve engineering communication systems in terms of energy efficiency in line with modern requirements, to justify their use for various purposes, and to gain skills and experience in ensuring energy- and resource-saving technologies in production. The student studies the structure and operating principles of heat supply systems; knows the basic laws and operating principles of gas supply systems; masters the types, structure and operating principles of ventilation systems; is able to calculate heat and gas consumption in heat supply, gas supply and ventilation systems; is able to determine heat exchange and heat losses; and complies with occupational safety and safety engineering requirements when using hydraulic equipment. **Prerequisites:** Physics; Mathematics. **Learning outcomes:** 1. Analyses the basic laws of heat supply, gas supply and ventilation systems. 2. Is able to select heat supply, gas supply and ventilation installations and equipment. 3. Performs the basic calculations of heat exchange, gas flow and air exchange processes. 4. Uses heat supply, gas supply and ventilation systems, machines and equipment efficiently. 5. Carries out the operation and maintenance of heat supply, gas supply and ventilation systems. 6. Identifies and eliminates faults in heat supply, gas supply and ventilation systems. 7. Uses heat supply, gas supply and ventilation equipment in compliance with occupational safety, safety engineering and fire safety rules.
Course content (topics)	**I. Main Theoretical Part (Lecture Sessions)** **Topic 1:** The Law of the Republic of Uzbekistan "On Education" and the educational standard. **Topic 2:** The curriculum. The graduation qualification thesis. The credit system in higher education institutions. **Topic 3:** Organization and structure of Jizzakh Polytechnic Institute. **Topic 4:** Water supply systems. Main elements of water supply systems. Cold water supply of buildings, sanitary equipment. **Topic 5:** Wastewater disposal systems. Internal sewerage systems of buildings.

	Topic 6: Design of heating, ventilation and air conditioning systems of buildings. **Topic 7:** Pumps and pumping stations used in engineering communications and their functions in the system. **Topic 8:** Gas supply systems. Main and distribution gas networks. **Topic 9:** Heat supply systems. Heat sources. Heat networks. **Topic 10:** Heating systems of buildings. Hot water supply. Water and air heating. **Topic 11:** Air exchange systems. Fans. Air conditioning. Central and local air conditioners. **Topic 12:** Heating, gas supply, ventilation and air conditioning engineering. **II. Practical training instructions and recommendations** The teacher's preparation for a practical training session begins with the study of preliminary documents (curriculum, thematic plan, etc.) and ends with the development of a lesson plan. The teacher should have an idea of the goals and objectives of the practical training session, the amount of work that each student must perform. Methodological guidelines are the main methodological document of the teacher in preparing and conducting practical training sessions. The purpose of the practical training session is to understand the theory, acquire skills. It is to consciously apply it in educational and professional activities, and to develop the ability to confidently form one's own point of view. **The following topics are recommended for practical training:** 1. Familiarization with the rules for using literature. (2 hours) 2. Determination of the water consumption of water supply systems. (2 hours) 3. Determination of the wastewater flow of sewerage systems. (2 hours) 4. Familiarization with pumps and pumping stations. (4 hours) 5. Familiarization with gas supply systems. (2 hours) 6. Familiarization with heat supply systems. (4 hours) 7. Familiarization with air exchange systems. (4 hours) 8. Engineering communication facilities. (4 hours) **III. Independent learning and independent work.** Independent learning competence serves to support students' independent self-development and increase the effectiveness of professional activities. Students perform independent work on their mobile devices under the guidance of a teacher in a traditional or electronic form. **Recommended topics for independent study:** 1. Familiarization with the structure and rules of the library. (8 hours) 2. Ways of finding the necessary literature. (8 hours) 3. Familiarization with the work of the institute’s laboratories. (8 hours) 4. Familiarization with the work of the department. (8 hours) 5. Familiarization with water supply and wastewater disposal systems. (8 hours) 6. Familiarization with gas supply systems. (8 hours) 7. Familiarization with heat supply systems. (8 hours) 8. Familiarization with ventilation systems. (8 hours) 9. Types of gas water heaters and their fields of application. (8 hours)
Exam form	Written
Teaching/learning and examination requirements	**Teaching technologies and methods:** lectures; interactive case studies; seminars (logical thinking, rapid question-and-answer sessions); group work; giving presentations; individual projects. Full mastery of the theoretical and methodological concepts of the

	course, the ability to present the results of analysis correctly, independent reasoning about the processes being studied, completion of the tasks and assignments set in the current and midterm forms of assessment, and submission of the assessment task for the final assessment. When drawing up final exam questions, deviations from the content of the discipline program are not allowed. The bank of final exam questions for each discipline is discussed at the meeting and approved by the head of the department. No later than 1 week before the start of the final control, tickets signed by the head of the department, enclosed in an envelope, are sealed by the Dean's office and opened 5 minutes before the start of the exam in the presence of students. Final exam duration is 80 minutes. Answers to final exam questions are recorded in copybooks with the seal of the Dean's office. After completion of the final work, the work is immediately encrypted by a representative of the Dean's office, and the copybooks are handed over to the commission for verification. From the moment of completion of the final exam, a period of 72 hours is allotted for checking and posting the results on the electronic platform. The teacher who taught the students in this discipline is not involved in the process of conducting the exam and checking the students' answers. Student(s) who are dissatisfied with the final exam results may submit a written or oral appeal within 24 hours of the publication of the final exam results. Complaints submitted after 24 hours from the publication of the final exam results will not be accepted.
Scope of assessment criteria and procedure	CURRENT CONTROL Purpose: Determining and assessing the student's level of knowledge, practical skills, and competencies on course topics. Instructions: The student's activity in daily classes is assessed through the student's mastery of course topics, as well as constructively interpreting and analyzing the educational material, developing module-specific skills, acquiring practical skills (in terms of quality and the specified number) and competencies, solving problem situations aimed at applying professional practical skills, working in a team, preparing presentations, etc. Current control form: Activity in lessons Preparing educational materials Working with sources within the subject Using educational technologies Working in a team Preparing presentations Working with projects. MIDTERM CONTROL Purpose: Assessing the student's knowledge and practical skills and level of mastery of lecture material after completing the relevant section of the course. Form and procedure of intermediate control: Midterm examination is held during the semester during the training sessions after the completion of the relevant module of the curriculum of the subject. Midterm examination is held once in written form within the framework of this subject. Midterm examination questions cover all topics of the subject. INDEPENDENT LEARNING Purpose: Independent learning is aimed at fully covering the content of this course, expanding the theoretical knowledge acquired, and establishing independent learning activities for students. Form and procedure of independent education: independent work assignments are completed in the form of an educational project, presentation, case study, problem solving, information search, digest, colloquium, essay, article, abstract, etc. Completed assignments for

independent study are placed in the electronic system and checked based on the anti-plagiarism program and evaluated by the subject teacher.

In this case, the uniqueness of the completed assignment should not be less than 60%, otherwise the assignment will not be accepted for assessment. The number of independent work assignments, depending on the nature of the subject, should not be less than 3 for one subject (module). Independent work assignments account for 60% of the points allocated for current and intermediate control.

FINAL CONTROL

Purpose: The final examination is held at the end of the semester to determine the level of mastery of the student's theoretical knowledge and practical skills in the relevant subject. The final examination is held at a specified time according to the examination schedule created by the Registrar's Office on the electronic platform.

Requirements: The student must have passed the current control, intermediate control and independent learning assignments by the deadline for the final control type in the relevant subject. A student who has not passed the current control, intermediate control and independent learning assignments, as well as who has received a score in the range of "0-29.9" for these assignments and control types, is not included in the final control type. Also, a student who has missed 25 percent or more of the classroom hours allocated to a subject without a reason is excluded from this subject and is not included in the final control type and is considered not to have mastered the relevant credits in this subject. A student who has not passed or was not included in the final control type and has received a score in the range of "0-29.9" for this type of control is considered to be an academic debtor.

Final control form: The final examination in this subject will be conducted in written form. If the final examination is conducted in written form, the requirements for assessment must also be reflected.

Criteria for assessing student knowledge

5 grade	100 points		Assessment criteria
5	90-100	Excellent	When a student is considered to be able to make independent conclusions and decisions, think creatively, observe independently, apply the knowledge he has gained in practice, understand, know, express, and narrate the essence of the subject, and have an idea about the subject.
4	70-89,9	Good	When the student is considered to be able to observe independently, apply the knowledge he has gained in practice, understand, know, express, and narrate the essence of the subject, and has an idea about the subject.
3	60-69,9	Satisfactory	When the student is found to be able to apply the knowledge he has gained in practice, understands, knows, can express, and narrate the essence of the subject, and has an idea about the subject.
2	0-59,9	Unsatisfactory	When it is determined that the student has not mastered the science program, does not understand the essence of the subject, and does not have an idea about the science.

Course assessment criteria and procedure

Assessment type	Total points	Control (task) form	Distribution of points	Qualifying score

	allocated			
Current assessment	30 points	System tasks	20 points (divided by the number of tasks)	18 points
		Student activity (in seminars, practical, laboratory classes)	10 points	
Midterm assessment	20 points	Supervision: Written work	10 points	12 points
		System tasks	10 points (divided by the number of tasks)	
Final assessment	50 points	Written assignment (5 questions)	50 points (10 points per question)	30 points
* Note: 60% of the points allocated for current and intermediate control are allocated to independent work assignments. Independent work assignments are evaluated as system assignments through the electronic platform.				

Recommended Literature

Main literature:

1. Ayupov Sh.A., Rahimov B.X., Yodgorov V.U., Nazarov H.H., Xo‘jayeva M.A. “Collection of Regulatory Documents of Higher Education (Part 2)”. Tashkent: Sharq, 2003. (in Uzbek)
2. Gadayev A.N. “Fundamentals of the Design and Engineering Calculation of Water Conveyance and Distribution Networks”. Study guide. Samarkand: SamSU, 2022. (in Uzbek)
3. Toshmatov N.U. “Gas and Oil Pipelines and Gas and Oil Storage Facilities”. Study guide. 2023. 160 p. (in Uzbek)
4. Tursunov M.K. “Heat Supply Systems”. Study guide. 2023. 136 p. (in Uzbek)
5. Toshmatov N.U., Mansurova Sh.P. “Fundamentals of Heat and Gas Supply and Ventilation”. Study guide. 2026. 132 p. (in Uzbek)

Additional literature

6. Meliyev B.O‘. “Engineering Equipment of Buildings”. Textbook. 2023. 210 p. (in Uzbek)
7. Musayev Sh.M. “Ventilation and Air Conditioning”. Textbook. 2023. 214 p. (in Uzbek)
8. Toshmatov N.U. “Gas and Oil Pipelines and Gas and Oil Storage Facilities”. Study guide. 2023. 140 p. (in Uzbek)
9. Tursunov M.K. “Ventilation and Air Conditioning Systems”. Study guide. 2023. (in Uzbek)
10. Musayev Sh.M. “Heat-Generating Equipment”. Study guide for students of higher education institutions. Tashkent: Lesson press, 2021. 158 p. (in Uzbek)

Internet resources:

1. www.gov.uz – Government portal of the Republic of Uzbekistan.
2. www.lex.uz – National database of legislation of the Republic of Uzbekistan.
3. https://t.me/archbookuz