COURSE SYLLABUS

Course title	**Technology of Construction Processes (4 ECTS)**
Course/module code	KJT1504
Semester(s) in which the course is delivered	Semester 5
Lecturer	Rahmonov Navruzbek Ergashevich
Language of instruction	Uzbek
Course type	Compulsory
Study hours (including independent study)	**Total workload: 120 hours** **Contact hours: 48 hours** Lectures: 24 hours Practical classes: 24 hours **Independent study: 72 hours**
ECTS credits	4
Course aims, objectives and learning outcomes	The aim of this course is to ensure that students acquire an in-depth understanding of the technological methods used in construction processes, integrate theoretical knowledge with practical skills, and develop as specialists capable of meeting the requirements of modern construction. The course enables students to gain a comprehensive understanding of the stages and technological sequence of construction processes, select materials and structural components appropriately, and take occupational safety and environmental requirements into account. It also focuses on the application of modern innovative technologies, the rational use of resources, and the achievement of economic efficiency. The objective of the course is to teach students the types of construction processes, their fundamental concepts and principles, the types of construction operations and processes, and the methods and equipment used to carry them out. **Learning outcomes:** 1. Students will be able to describe the sequence and methods involved in organising construction processes. 2. Students will be able to explain the role of technological design in construction and identify the types of technological design documents. 3. Students will acquire the skills required to organise the preparation of process flow charts for various construction processes. 4. Students will be able to select the most efficient set of construction machinery and appropriate operating/movement patterns for carrying out

	construction processes. 5. Students will acquire the skills and competencies required to develop measures ensuring compliance with occupational health and safety requirements in all types of construction processes. 6. Students will be able to develop alternative competitive methods for performing construction work and conduct technical and economic comparisons of these alternatives.
Course content (topics)	**I. Core theoretical component (lectures)** **Topic 1.** Introduction. Fundamental concepts and principles of construction process technology. **Topic 2.** Design of construction technologies. **Topic 3.** Engineering preparation of the construction site. **Topic 4.** Technology of soil excavation and handling. **Topic 5.** Mechanised methods of soil excavation and handling. **Topic 6.** Foundation construction technology. **Topic 7.** Bricklaying and stone masonry technology. **Topic 8.** Fundamental principles of construction structure erection and installation technology. **Topic 9.** Erection and installation of structures in industrial and civil buildings. **Topic 10.** Technology of cast-in-place concrete and reinforced concrete. **Topic 11.** Technology for the installation of protective coatings. **Topic 12.** Technology of finishing works. **II. Guidelines and recommendations for practical classes** The lecturer's preparation for practical classes begins with the study of the relevant preliminary documents (the curriculum, thematic plan and other materials) and is completed by preparing the lesson plan. The lecturer should have a clear understanding of the aims and objectives of the practical class and the scope of work to be completed by each student. Methodological guidelines serve as the principal instructional document for lecturers when preparing and conducting practical classes. The purpose of practical classes is to develop students' understanding of theoretical material and help them acquire practical skills. These classes are intended to develop students' ability to apply their knowledge consciously in academic and professional activities and to formulate and substantiate their own viewpoints. **Recommended practical topics:** 1. Regulatory documents used in construction: KMK, SHNK and other applicable regulations. 2. Calculation of construction work quantities and labour requirements. 3. Calculation of work quantities for the vertical planning of a construction site.

	4. Earthworks: problems involving the calculation of soil volumes excavated from pits and trenches. 5. Earthworks: exercises and problems on selecting excavators for pit and trench excavation and selecting transport machinery for hauling soil. 6. Calculation of the volume of bricklaying and masonry work and the associated labour requirements. 7. Determining work areas and dividing bricklaying operations into sections. 8. Calculation of the volume of installation work and the associated labour requirements. 9. Determination of the labour required for constructing monolithic structures. 10. Calculation of roof construction work quantities. 11. Determination of the labour required to carry out roofing works. 12. Determination of the labour required for finishing works and preparation of a cost estimate for finishing works. **III. Independent study and self-directed work** Independent learning helps students develop the ability to improve their knowledge autonomously and contributes to increased efficiency in their professional activities. Students complete independent assignments on their mobile devices, either in a conventional format under the lecturer's supervision or in electronic format. **Recommended topics for independent study:** 1. Participants in construction, construction processes and construction operations. 2. Quality control of construction and installation works and occupational health and safety in construction. 3. Construction standards and regulations. 4. Engineering and geological investigations. 5. Diversion and removal of surface water and groundwater. 6. Components of the technological process of soil excavation and handling. 7. Soil properties relevant to construction. 8. Soil excavation using single-bucket and multi-bucket excavators. 9. Soil excavation using earthmoving and earth-transport machinery. 10. Soil compaction and tamping. 11. Technology for the construction of strip foundations. 12. Technology for the construction of a monolithic slab. 13. Technology for the construction of a pile cap (grillage). 14. Elements of brick and stone masonry; materials used for brick and stone masonry. 15. Calculation of the volume of bricklaying and masonry work. 16. Construction of block walls using aerated concrete, foam concrete and expanded-clay concrete blocks.

17. Modern formwork systems in construction: tunnel formwork, slip-form systems and modular formwork.

18. Energy-efficient construction technologies: principles of green construction.

19. Methods and equipment for transporting structural components.

20. Erection cranes and construction mechanisms.

21. Erection of structures for single-storey industrial buildings with reinforced-concrete frames.

22. Erection of structures for multi-storey industrial buildings.

23. Technology for organising cast-in-place concrete and reinforced-concrete works.

24. Technology for concreting structural components.

25. Types of roof coverings and their technological characteristics.

26. Technology for installing tiled roof coverings.

27. Technology of plastering processes.

28. Technology of surface tiling and cladding processes.

29. Technology for installing timber floor coverings.

30. Wallpapering technology.

IV.Methodological Guidelines for Organizing Coursework

The coursework is scheduled for the 5th semester in the subject "Construction Process Technology." The purpose of the coursework is to develop students' ability to work independently, acquire practical skills in applying the theoretical knowledge they have gained, make technical decisions appropriate to actual production conditions, and develop the ability to apply modern machinery, equipment, and technologies.

The coursework topics are determined in direct connection with technological processes in construction production and are selected with reference to the specific construction conditions of a particular building or structure. The coursework topics are prepared in advance in a quantity 20–30% greater than the total number of students. Each student is assigned an individual task. The subject of the coursework is an advanced construction technique or technology used under specific conditions for the construction of a particular building or structure. The type of technology most suitable for the given conditions is selected and calculated based on the use of machinery and equipment, and its alternatives are comparatively evaluated from a technical and economic perspective. The calculation and graphical components of the coursework project are primarily carried out using modern computer software. The graphical part of the coursework project consists of one or two drawings in A2 format. The explanatory report must be 20–25 pages long, prepared on a computer using 14-point font size and 1.15 line spacing. The coursework covers the following topics. Each topic is divided into several variants:

Topic1. Trench Excavation Technology Using a Single-Bucket Excavator.

Topic2. Construction Technology for Buildings with Brick Walls.

Student assessment	Student assessment is based on the level of mastery of the learning materials throughout the semester and during the final assessment. Evidence of achievement includes test results, assignments, and written and oral work. Throughout the Technology of Construction Processes course, students are assessed on a 100-point scale. A total of 50 points is allocated to ongoing and midterm assessment (of these 50 points, 60% is allocated to ongoing assessment and independent study, and 40% to midterm assessment), while the remaining 50 points are allocated to the final assessment. Students who obtain fewer than 30 points in total from ongoing and midterm assessment are not admitted to the final examination. A student who obtains 30 or more points in the final assessment is considered to have successfully completed the course.
Requirements for examinations	Students must demonstrate a full understanding of the theoretical and practical concepts covered in the relevant topics and be able to present the results of their analyses accurately. Students must complete the assignments set as part of independent study and the ongoing and midterm assessment components. In addition, within the prescribed period, students must obtain the required number of points in ongoing assessment, midterm assessment, independent study and the final assessment. A student who has not submitted the ongoing assessment, midterm assessment and independent study assignments, or who has obtained fewer than 30 points for these assignments and assessment components, is not admitted to the final assessment. Furthermore, a student who, without a valid reason, misses 25% or more of the contact hours allocated to the course will be excluded from the course, will not be admitted to the final examination and will be considered not to have earned the credits assigned to the course. A student who fails the final examination or obtains a score in the range of 0–29.9 points in this examination is considered to have an academic debt.
Recommended reading	**Core literature:** 1. X.I. Yusupov, A.M. Ilmuradov, A.M. Raximov, R.A. Norov, V. Rasulov, A.T. Ilyasov, B.T. Xushnazarov, I.N. Salimova, O.T. Xushnazarov, K.U. Tashxodjayeva, F.R. Safarov Qurilish jarayonlari texnologiyasi. Darslik Toshkent "Innovatsiya-Zioy" 2021 2. Asatov N. A . Qurilish jarayonlari texnologiyasi (o'quv qo'llanma) Jizzax 2021. y 169 bet **Additional literature:** 3. Hanizam Awang Md Azree. Othuman Mydin. "Construction Methods and Technology" Penerbit Universiti Sains Malaysia, 2016 **Online resources:** 4. https://www.ziyonet.uz/ 5. Academia.edu