Subject Name	Organization and Planning of Construction (ECTS 4/4)
Module Code	QTER1710
Semesters Taught	4th / 7th / 8th semesters
Assigned Instructor	Siddiqov Mo‘minjon Yunusovich, Associate Professor
Language of Instruction	Uzbek
Course Type	Mandatory
Study Hours (including independent study)	**Total hours:** 240 **Auditorium hours:** 96 **Lecture hours:** 48 **Laboratory hours:** - **Practical hours:** 48 **Independent study:** 144 hours
ECTS Credits	4 / 4
Course Objectives, Tasks, and Learning Outcomes	**Objective:** To form theoretical and practical knowledge among students on scientifically based management of construction processes – ensuring optimal project deadlines, quality, and costs. Efficient resource distribution – correct planning of labor, machinery, materials, and financial resources. Determining technological sequence – defining the logical order and interdependence of construction works. Monitoring deadlines and budget – preventing delays through graphic schedules (Gantt, network diagrams). Compliance with quality and safety standards – adherence to regulatory requirements. **Tasks:** To teach students: 1. Designing technological processes – selecting work sequences, methods, and technical solutions; 2. Calculating production resources – determining needs for labor, machine-hours, materials, and mechanisms; 3. Creating calendar schedules – defining construction timelines, identifying the critical path, and forming graphs; 4. Organizing the site – developing the construction site master plan (BPP), temporary structures, and logistics schemes; 5. Evaluating economic efficiency – optimizing costs, forming budgets, and establishing financial control; 6. Quality and safety control – complying with regulatory requirements, implementing occupational safety rules; 7. Operational management – analyzing changes in plans, eliminating delays, and redistributing resources. **Learning Outcomes:** 1. **Knowledge:** Knows the theoretical foundations of organizing construction processes, regulatory documents, and modern management methods. 2. **Skills:** Independently calculates and draws construction master plans (BPP), calendar schedules (Gantt, network), and resource requirements. 3. **Analysis:** Analyzes the relationship between project duration, costs, and quality to select optimal solutions. 4. **Practice:** Correctly places the construction site logistically, designs temporary structures, and defines work sequences. 5. **Management:** Can efficiently distribute resources, control the budget, and adapt plans in emergency situations.
Course Content (Topics)	**I. Main Theoretical Part (Lectures)** Topic 1: Introduction to the subject, goals, tasks, and basic concepts of

organizing construction processes.
Topic 2: Regulatory documents in construction, SNiP and UzDSt requirements.
Topic 3: Project study, volume determination, and technical-economic indicators.
Topic 4: Site clearing, geodetic works, and engineering preparation.
Topic 5: Temporary structures: Rules for calculating areas for offices, warehouses, and housing.
Topic 6: Construction Master Plan (CMP) – I: Principles of placing transport roads, cranes, and mechanisms.
Topic 7: Construction Master Plan (CMP) – II: Designing power supply, water supply, and sewage networks.
Topic 8: Technological maps: Graphical representation of work methods and sequences.
Topic 9: Selection of machines and mechanisms: Calculating productivity of cranes, excavators, and vehicles.
Topic 10: Determining the number of workers by profession and shift regimes.
Topic 11: Calculating reserves of main construction materials and structures.
Topic 12: Creating Gantt charts and defining deadlines.
Topic 13: Network graphics (CPM): Logical connection of events and works, identifying the critical path.
Topic 14: Resource leveling: Optimizing labor and machinery loads.
Topic 15: Logistics to the object: Schemes for storing and unloading materials at the site.
Topic 16: Working in winter and summer conditions: Special measures and cost considerations.
Topic 17: Quality control system: Incoming, operational, and acceptance control stages.
Topic 18: Occupational safety and protection: Hazardous zones, personal protective equipment, and instructions.
Topic 19: Fire safety: Fire prevention measures in temporary structures.
Topic 20: Budget formation: Calculating direct costs, overheads, and profit.
Topic 21: Unforeseen expenses: Risk assessment and creating reserve funds.
Topic 22: Modern management software: Practice of creating plans using MS Project or Primavera.
Topic 23: Operational management and reporting: Daily and weekly reports, delay analysis.
Topic 24: Final project defense: Presentation of complex BPP and calendar schedule.

II. Laboratory Work Instructions

Laboratory work is not provided in the curriculum.

III. Practical Work Instructions and Recommendations

The instructor's preparation begins with studying initial documents (curriculum, topic plan, etc.) and ends with creating lesson plans. The instructor must understand the goals, tasks, and workload for each student. Methodological guidelines are the main document for preparing and conducting practical classes. The goal is to understand theory, gain skills, apply them consciously, and develop independent viewpoints.

Recommended Practical Topics:

1. Reading project-estimate documents: Determining work volumes

based on architectural-construction drawings (creating ведомости/bills of quantities).
2. Topographic plan of the construction site: Practice of transferring geodetic signs and zoning the site. Calculating areas for temporary structures (offices, warehouses, housing) based on norms.
3. Designing transport roads in CMP: Placing crane working radii and unloading points.
4. Selecting and placing erection cranes: Calculating load capacity and height, placing them in the CMP.
5. Demand for main construction materials: Calculating reserves of concrete, brick, reinforcement, and wood.
6. Calculating labor demand: Determining the number of workers by profession and creating a "Labor Force Movement" graph.
7. Forming the machine and mechanism park: Calculating demand for excavators, dump trucks, and pumps.
8. Creating a technological map (I): Step-by-step description of bricklaying or monolithic concrete pouring.
9. Creating a technological map (II): Applying time norms for operations and defining brigade composition.
10. Linear calendar schedule (Gantt) – I: Graphically representing work sequence for a simple object.
11. Linear calendar schedule (Gantt) – II: Formalizing the graph in MS Excel or special software.
12. Elements of network graphics (CPM): Linking events and works, introducing dummy works.
13. Identifying the critical path: Finding the longest path in the network graph and calculating reserve times.
14. Resource leveling: Eliminating "peaks" and "valleys" in the labor force graph.
15. Drawing Construction Master Plan (BPP) – I: Choosing scale and placing permanent structures.
16. Drawing Construction Master Plan (BPP) – II: Placing temporary communications (water, electricity).
17. Winter work regime: Adjusting the graph considering heat preservation measures.
18. Quality control journal: Practice of filling out incoming control acts and hidden work certificates.
19. Developing safety technique plan: Marking hazardous zone boundaries in BPP and calculating protective equipment.
20. Budget formation: Creating direct cost estimates and applying prices.
21. Cash Flow graph: Creating a financial plan by comparing monthly payments and material costs.
22. Working in project management software: Creating a simple project and assigning resources in MS Project or Primavera.
23. Final complex project defense: Presenting BPP, calendar schedule, and resource schedule for the selected object.

IV. Independent Study and Independent Work

Independent education helps students' self-development and improves professional efficiency. Students perform independent work under instructor guidance, traditionally or electronically, on mobile devices.

Recommended topics for independent study (144 hours):

I. Theoretical Foundations and Normative Documents (24 hours)

1. Modern principles and methods of organizing construction works.
2. Analysis of regulatory-legal documents in construction in the Republic of Uzbekistan (SNiP, UzDSt).

	3. Composition of project-estimate documents and rules for reading them. 4. Procedure for engineering-geological and geodetic preparation of the construction site. **II. Designing Construction Master Plan (CMP) (32 hours)** 5. Methodology for calculating areas of temporary structures (office, warehouse, housing). 6. Developing transport-logistics schemes at the construction site. 7. Selecting erection cranes and mechanisms and placing them in the BPP. 8. Designing temporary water supply, sewage, and power supply networks. 9. Creating BPP in compliance with fire safety and occupational safety requirements. 10. Features of organizing the construction site in winter and summer conditions. **III. Technological Processes and Resource Planning (36 hours)** 11. Creating technological maps for main construction works (earth, concrete, installation, finishing). 12. Calculating labor demand by professions and developing shift regimes. 13. Determining demand for construction materials, structures, and items. 14. Forming the machine and mechanism park and calculating their productivity. 15. Logistics of storage, transportation, and delivery of materials to the site. **IV. Calendar Planning and Deadline Management (28 hours)** 16. Creating and analyzing linear (Gantt) calendar schedules. 17. Network graphics (CPM/PERT) methods and critical path identification algorithms. 18. Resource leveling and optimization methods. 19. Developing measures for shortening (Crashing) and accelerating project duration. **V. Economic Evaluation and Quality Control (24 hours)** 20. Forming the budget of construction works and calculating costs. 21. Cash Flow analysis and financial planning. 22. Quality control system: incoming, operational, and acceptance control stages. 23. Risk assessment in construction and action plans against them. **VI. Modern Management Systems and IT Technologies (24 hours)** 24. Practice of creating project plans in MS Project, Primavera, or analog software. 25. BIM (Building Information Modeling) technologies and their role in organizing construction. 26. Concept of Digital Construction Sites (Smart Construction Site). 27. Operational management, reporting forms, and delay analysis methods.
Student Assessment	Student knowledge is assessed based on mastery of teaching materials during the semester and final control (tests, tasks, written and oral work results). Throughout the course, students are graded on a 100-point scale. Of this, **50 points** are allocated to current and interim results (60% of the 50 points for current control and independent study, and 40% for interim control), and **50 points** for the final control result. Students who score less than 30 points in total for current and interim assessments are not admitted to the final exam. A student who scores 30 or more points in the final control is considered to have mastered the course.
Exam Requirements	The student must fully master theoretical and practical concepts on the

	topic and correctly reflect analysis results. The student must have completed independent work, current, and interim assessment tasks. Additionally, the student must have obtained the required points for current, interim, independent study, and final controls within the specified time. A student who has not submitted current, interim, and independent study tasks, or scored less than 30 points in these types of control, is not admitted to the final control. Also, a student who misses 25% or more of the auditorium hours without valid reason is excluded from the course, not allowed to take the final exam, and considered to have not mastered the relevant credits. A student who fails the final exam or scores in the range of "0-29.9" is considered to have academic debt.
Recommended Literature	1. M.M. Mirakhmedov, X.I. Yusupov, I.M. Mahamataliyev, E.A. Shomirzayev, A.T. Ilyasov. *Organization and Planning of Construction*. Textbook, Parts 1, 2. Tashkent: TTYMI, NFQI, 2018. 2. Shim, Jae K., Joel G. Siegel, and Allison I. Shim. *Budgeting basics and beyond*. John Wiley & Sons, 2011. 3. Hinze, Jimmie. *Construction planning and scheduling*. Pearson Education, 2012. 4. L.G. Dikman. *Organization of Construction Production*. Publishing House of the Association of Construction Universities, Moscow 2003. 5. M.Y. Siddiqov. *Organization and Planning of Construction*. Textbook – Jizzakh 2021 - 200 p. 5. M.Y. Siddiqov. *Organization and Planning of Construction*. Textbook – Tashkent 2024. 6. ShNK Z.01.01-03. Organization of Construction Production. 7. QMQ 1.04.03-85. Norms and zadeli for the construction duration of enterprises, buildings, and structures. 8. www.mc.uz 9. https://gov.uz/oz/mc/sections/shaharsozlik-normalari-qurilish-va-texnik-reglamentlar 10. www.ZiyoNet.uz 11. www.twirpx.com