

Identification	Department	Engineering and Applied Sciences	
	Program	Bachelor	
	Subject	Economics of Construction	
	Term	Fall, 2026	
	Instructor	Sabira Shahmarova	
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	Phone:		
Prerequisites	Economics of Construction		
Language	English		
Compulsory/Elective	Compulsory		
Text books and course materials	Slides and lectures will be shared by group e-mail on the instructor’s Dropbox. Core textbooks: 1. Ebekozien, A. & Aigbavboa, C. (2024). Principles of Basic Construction Economics in the 21st Century. Emerald Publishing / ICE Publishing. 2. Myers, D. (2022). Construction Economics: A New Approach (5th ed.). Routledge. 3. Aigbavboa, C. & Kissi, E. (2025). Digital Management of Construction Costs. Elsevier. 4. Peterson, S. J. & Dagostino, F. R. (2024). Estimating in Building Construction (10th ed.). Pearson. 5. Roberts, D. & Gomathinayagam, G. (2026). Cost and Project Management of Modern Methods of Construction. Routledge. Selected supplementary readings: 6. Kaur, R., Mwambelele, B. J., Abraham, A. G., Basheer, S. A., Garia, S. et al. (2025). A comprehensive review on building information modelling (BIM), its implementations and applications. Discover Civil Engineering, 2, 177. 7. Rong, X., Zou, J. & Mohandes, S. R. (2025). The Application of BIM for Construction Circular Economy: A Systematic Literature Review. Proceedings of ARCOM 2025. 8. Vella, A., Abu-Ghaida, H., Lam, W. C. & Ritzen, M. (2026). Life cycle costing in the circular economy: a state-of-the-art review of current trends in the building construction sector. Discover Applied Sciences, 8, 235. 9. Garcés, G., Forcael, E., Osorio, C., Castañeda, K. et al. (2025). Systematic review of Lean Construction: an approach to sustainability and efficiency in construction management. Journal of Infrastructure, Preservation and Resilience, 6, 6. 10. Novaković, A. (2025). Reconceptualizing Quantity Take-Off and Cost Estimation through Building Information Modeling: A Theoretical and Empirical Synthesis of BIM-Based Estimation Practices. American Applied Science and Technology Journal, 5(07), 104–108.		
Teaching methods	Case analysis		X
	Group discussion		X
	Lab		
	Lecture		X
	Course paper		X
	Others		
Evaluation Criteria	Methods	Date/d eadlin es	Percentage (%)
	Midterm Exam		30
	Case studies		
	Class Participation and Activity		10
	Quizzes		20
	Project		
	Presentation		
	Laboratory Work (Assignments)		
	Final Exam		40
	Other		
Total		100%	
Course objectives	The course introduces the principles, methods and contemporary applications of Construction Economics. It examines how economic theory is applied to construction projects, firms, assets and markets, and develops students’ ability to make economically sound decisions under resource constraints, uncertainty, technological change and sustainability requirements. The course progresses from the foundations of Construction Economics to cost planning, pricing, finance, investment, risk, productivity, digitalization, life-cycle value and circular construction.		
Learning outcomes	• Define Construction Economics and explain its scope, objectives, principles and relationship with general economics. • Explain the role and economic contribution of the construction industry and identify its main stakeholders and economic relationships		

	• Analyze construction demand, supply, market structure, competition, economic cycles and macroeconomic influences. • Apply economic principles of scarcity, opportunity cost, marginal analysis and resource allocation to construction decisions. • Prepare and interpret approximate estimates, cost plans, elemental costs, bills of quantities and construction cost information. • Analyze construction prices, cost indices, inflation, escalation and the effect of economic conditions on project costs. • Evaluate fixed assets, construction equipment, depreciation, replacement and capital productivity. • Analyze construction labor markets, human capital, wage systems, labor productivity and skills requirements. • Prepare basic project budgets, cash-flow forecasts and financial feasibility assessments. • Apply investment appraisal methods, including discounted cash flow, NPV, IRR, payback and benefit-cost analysis. • Identify and evaluate construction risks and apply sensitivity, scenario and contingency analysis. • Compare procurement and contracting strategies from the perspective of cost, value, incentives and risk allocation. • Explain Lean Construction and evaluate its economic contribution through productivity and waste reduction. • Explain BIM and 5D BIM applications to quantity take-off, estimating, cost planning and cost control. • Assess the economic implications of AI, automation, digital twins and data-driven construction management. • Apply life-cycle costing and whole-life value principles to building and infrastructure decisions. • Evaluate sustainable and circular construction alternatives considering economic, environmental and social value. • Communicate evidence-based economic recommendations through case studies, calculations and a construction economics project.
Course outline	The course combines lectures, practical calculations, case analysis, group discussion and project work. The first part establishes the foundations of Construction Economics and the economic role of the construction industry. The second part develops cost, price, labor, asset and financial analysis. The third part addresses risk, procurement, productivity and Lean Construction. The final part examines BIM/5D BIM, AI and digital construction, life-cycle costing, sustainability and circular economy. Students will use current academic literature and applied construction examples throughout the course.
Policy	Preparation for class Students are expected to read assigned materials, review lecture notes and complete relevant calculations and case studies before class. 1. Withdrawal (pass/fail) This course follows the grading policy of the School of Engineering and Applied Science. A student is normally expected to achieve at least 60% to pass. 2. Cheating/plagiarism Cheating or plagiarism during quizzes, examinations, assignments or project work may result in cancellation of the relevant work and a grade of zero, in accordance with university regulations. 3. Professional behavior guidelines Students shall maintain a favorable academic and professional environment. Unauthorized discussions and unethical behavior are prohibited. 4. Ethics Students should arrive on time. Electronic devices may be used only for authorized academic

	purposes. Lessons are conducted in English that's why questions and their answers must be in English. 5. AI Policy GAI tools (e.g., ChatGPT, Copilot) are partially permitted in this course solely for initial brainstorming, structuring cost estimation frameworks, and proofreading written text. All financial calculations, market analyses, and final feasibility conclusions must be the student's independent work. AI usage must not exceed 25% of the content and must be explicitly declared according to Section 8 of the university policy; undisclosed use will result in a zero grade (0).
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Tentative Schedule			
Week	Date	Topics	Textbook/Assignments
1	19.09.2026	Introduction to Construction Economics Scope, principles and role of Construction Economics	Ebekozien, A. & Aigbavboa, C. (2024), Principles of Basic Construction Economics in the 21st Century, Emerald; selected current Construction Economics literature
2	26.09.2026	Construction Industry and Economic Role Construction Markets: Demand, Supply and Market Structure	Ebekozien & Aigbavboa (2024), Ch. 1; selected current literature on construction markets, demand, supply and industry economics.
3	03.10.2026	Construction Costs and Cost Estimation Construction Prices, Inflation and Cost Escalation	Ebekozien & Aigbavboa (2024), Chs. 2–3; Lee, S. et al. (2024), “Influence of macroeconomic factors on construction costs,” Construction Management and Economics, 43(3), 196–212.
4	10.10.2026	Value Management and Value Engineering Whole-Life Costing and Life-Cycle Value	Ebekozien & Aigbavboa (2024), Ch. 4; Shen, G.Q. & Xue, J. (2025), “Ensuring Value for Money in Large and Complex Construction Projects,” Civil Engineering Sciences, 1, 0003; “Value engineering in construction: a systematic review of applications and research trends” (2025), ECAM, 32(13), 477–500.
5	17.10.2026	Construction Assets, Equipment and Depreciation Capital Productivity and Equipment Economics	Ebekozien & Aigbavboa (2024), Chs. 2–3; selected current literature on construction equipment economics, depreciation, replacement and capital productivity.
6	24.10.2026	Construction Finance and Project Cash Flow Investment Appraisal: NPV, IRR and Payback	Ebekozien & Aigbavboa (2024), Chs. 3, 6; selected current literature on construction finance, project cash flow and investment appraisal (NPV, IRR and payback).
7	31.10.2026	MIDTERM EXAM	
8	07.11.2026	Labor Economics, Human Capital and Wages Construction Labor Productivity and Workforce Skills	Qi, K., Owusu, E.K., Siu, M.F.F. & Chan, P.C.A. (2024), “A systematic review of construction labor productivity studies,” Ain Shams Engineering Journal, 15(9), 102896; “Critical Factors Affecting Construction Labor Productivity: A Systematic Review and Meta-Analysis” (2025), Buildings, 15(14), 2463.
9	14.11.2026	Construction Risk and Uncertainty Sensitivity, Scenario and Contingency Analysis	Ghanbaripour, A. et al. (2025), “Artificial intelligence in construction risk management: a decade of developments, challenges, and integration pathways,” Journal of Risk Research, 28(9–10), 1078–1110; “Traditional to sustainable risk

			management in the construction industry: a systematic literature review” (2025), IJMPB, 18(3), 528–565.
10	21.11.2026	Procurement and Contracting Economics Contract Pricing, Incentives and Risk Allocation	“Incentives and effort elicitation in construction contracting: modeling strategic behavior under DBB and CMR/GMP contracts” (2025), Construction Management and Economics, 44(2); Ebekozién & Aigbavboa (2024), selected chapters on cost and contracts.
11	28.11.2026	Lean Construction and Economic Efficiency Productivity, Waste Reduction and Value Generation	Garcés, G., Forcael, E., Osorio, C. et al. (2025), “Systematic review of Lean Construction: an approach to sustainability and efficiency in construction management,” Journal of Infrastructure Preservation and Resilience, 6, 6; “Trends and gaps in lean construction practices for construction of megaprojects” (2025), Alexandria Engineering Journal, 118, 174–193.
12	05.12.2026	BIM and 5D BIM Cost Management Digital Construction, AI and Automation Economics	Kaur, R., Mwambele, B.J., Abraham, A.G., Basheer, S.A. & Garia, S. (2025), “A comprehensive review on BIM,” Discover Civil Engineering, 2, 177; Cassandro, J., Mirarchi, C. & Pavan, A. (2025), “A comprehensive literature review of 5D BIM,” Construction Innovation, 25(7), 331–357; Novaković, A. (2025), “Reconceptualizing Quantity Take-Off and Cost Estimation through BIM,” AASTJ, 5(07), 104–108; “AI and machine learning in BIM-based construction cost estimation” (2026), DOI: 10.1080/10095020.2026.2651578.
13	12.12.2026	Sustainable Construction Economics Life-Cycle Value, Energy Efficiency and Carbon Economics	Ebekozién & Aigbavboa (2024), Chs. 4 & 7; Tighnavard Balasbani, A., Sher, W. & Li, J. (2025), “A systematic review of the life cycle cost estimation of upgrading buildings for sustainability,” Environmental Science and Pollution Research, 32, 19649–19671; RICS (2025), Lifecycle Costing, 1st ed.
14	19.12.2026	Circular Economy in Construction BIM-Enabled Circularity and Circular Business Models	Rao, P.A., Rahman, M.M. & Duraman, S.B. (2025), “Adopting circular economy in construction: a review,” Frontiers in Built Environment, 11, 1519219; Rong, X., Zou, J. & Mohandes, S.R. (2025), “The Application of BIM for Construction Circular Economy: A Systematic Literature Review,” ARCOM 2025; Vella, A., Abu-Ghaida, H., Lam, W.C. & Ritzen, M. (2026), “Life cycle costing in the circular economy,” Discover Applied Sciences, 8, 235.
15	26.12.2026	Future Construction Economics: Innovation and Resilience Final Project Presentations and Comprehensive Review	Kaur et al. (2025), BIM review; Garcés et al. (2025), Lean Construction review; “Mapping the landscape of productivity in construction research: an umbrella review of trends, gaps and future directions” (2026), Engineering, Construction and Architectural Management; selected current 2025–2026 literature on AI, digital twins, innovation and resilience.
16		FINAL EXAM	