ALTINBAŞ UNIVERSİTY

Department of Civil Engineering

Syllabus of CVE550 Construction Project Management

NOTE: This syllabus is subject to change. Any changes will be communicated in advance.

1. COURSE INFO	*Credits*	(3+0+0) 3
	Lecture Hours	Wednesday, 19:00 – 22:00
	Lecture Hall	D503
2. INSTRUCTOR	*Name*	Işık Ateş Kıral
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3. COURSE TEXTBOOK

Project Management Institute. (2017). A guide to the project management body of knowledge (PMBOK guide). Newtown Square, Pennsylvania, 6th edition.

4. COURSE DESCRIPTION (CATALOG)

In this course, it is aimed to establish a base for students to develop necessary skills and knowledge about managing projects in the construction industry. In order to accomplish this aim, this course is designed to provide an integrating perspective on the issues of managing construction projects by introducing students to the units existed on Project Management Body of Knowledge that are incorporated under the term 'management of projects'. Moreover, the course prepares students for the PMI body of knowledge though class lectures leading to the possibility of enrolling for the PMP certificate. Last but not least, through summary reports, it is aimed that students gain experience in areas such as academic writing and literature review, which are some of indispensable issues in research methodology.

Course Type

Elective

Laboratory and Computer Usage

N/A

Grading Policy:

- In-class Bonus Points: Individual extra points based on the performance of students' comments, answers to questions, additional comments during the lectures (maximum 20%)
- Summary Report Assignments: Summary and critical review of the assigned journal papers 25% of the course grade.
- Midterm Examination: 25% of the course grade.
- Final Examination: Comprehensive exam at the end of the semester, 50% of the course grade.

5. SPECIFIC GOALS FOR THE COURSE

SPECIFIC OUTCOMES OF INSTRUCTION

- To develop necessary skills and improve the knowledge level about the concepts of basics of the construction project management such as the definition of project, project life-cycle, organizational strategy and organizational project management.
- To develop necessary skills and improve the knowledge level about the concepts of organizational structures such as organic structure, functional structure, projectized structure, matrix structure and composite structure.
- To develop necessary skills and improve the knowledge level about the concepts of human-based skills of project manager such as leadership and motivation.
- To develop necessary skills and improve the knowledge level about the concepts of time management such as scheduling, resource leveling, and network diagrams.
- To develop necessary skills and improve the knowledge level about the concepts of cost management such as cost estimating methods, earned value management, cost crashing and cost categorization.
- To develop necessary skills and improve the knowledge level about the concepts of risk management such as risk definition, framing, decision-making processes, risk classification, checklist, brainstorming, Delphi method, swot analysis, sensitivity analysis.
- To develop necessary skills and improve the knowledge level about the concepts of engineering economics such as net benefit, marginal principle, and cost - benefit plot, net present value, payback period, internal rate of return, profitability index.
- To develop necessary skills and improve the knowledge level about the concepts of project finance such as project finance, build-operate and transfer, private finance initiative, financial models and the definition of project finance.
- To develop necessary skills and improve the knowledge level about the concepts of contract management and procurement procedures such as traditional Management, design and build, management contracting, construction management, contract management, fixed-price contracts, fixed-price contracts.

STUDENT OUTCOMES

This course is intended to contribute to the following student outcomes:

1. To be able to apply mathematics, science and engineering knowledge realistically
4. To be able to work in a multi-disciplinary team environment
5. To identify, identify, formulate and solve engineering problems
6. Having professional and ethical responsibility
7. To communicate effectively
10. To have information about current issues and problems
11. To be able to use modern technical methods and tools required for engineering practice
12. Having skills in basic principles of Civil Engineering and being able to use these basic principles in research and application areas
14. Having knowledge in other scientific fields and being able to apply scientific innovations and developed techniques in other fields to the field of Civil Engineering

Week	Date	Lecture(s)	Content
1	9th October	Lecture 0 – Orientation Lecture 1 – Introduction to Management of Construction Projects	Definition of Project and Operation, Project and Operation Dilemma, The Characteristics of Construction Projects, Types of Projects, Project Life Cycle, Project Management, Program and Portfolio Management, Organizational Strategy and Organizational Project Management, Project Management Office, Project Constraints, Project Management Institution Knowledge Areas, Construction Specific Project Management Knowledge Areas
2	16th October	Lecture 2 – Organizational Structures Lecture 3 – The Role and Individual Skills of Project Manager in Construction Projects	The Definition of Two Phenomena: Differentiation vs Integration, Organization Structures, Selecting Proper Organizational Structure, Organic Organizational Structure, Functional Organizational Structure, Projectized Organizational Structure, Weak Matrix Organizational Structure, Balanced Organizational Structure, Strong Organizational Structure, Composite Organizational Structure, Which Structure to Use In the Construction Industry, Project Manager Responsibilities, Human-Based Skills of Project Manager, The Definition of Leadership, The Types of Power, Personal Traits of Effective Leader, Leadership Skills, Leadership Theories, Project Team Leadership and the Project Life Cycle, The Definition of Motivation, Motivation Theories, Motivation Process Theories, Motivation in Project Management and Construction Workers Perspective
3	23rd October	Lecture 4 – Scope Management Lecture 5 – Time Management Midterm Examination Preparation	The Definition of Scope Management, The Objectives of Scope Management, Scope Management Start Process - Project Charter, Scope Management Start Process - Sample Project Charter, Scope Management Processes – Planning Process, Scope Management Processes - Creating a Work Breakdown Structure, The Definition of Time Management, Time Management Processes, Defining Activities, Activity Sequencing, The Types of Relationships Between Activities, Use of Man-Hour Method for Determination of Activity Duration, Network Diagrams, Network Diagrams - Example
4	30th October	Midterm Examination	
5	6th November	Midterm Evaluation Lecture 5 – Time Management - Continued	Network Diagrams, Project Evaluation and Review Technique (PERT), Resource Histogram, Resource Leveling, The Two Key Elements of Resource Leveling, Resource Leveling Techniques
6	13th November	Lecture 6 – Cost Management	The Definition of Cost Management, Cost Management Process, Plan Cost Management, Estimate Costs, Cost Categorization, The Categorization of Costs, Categorizing based on type, Categorizing based on burden, Categorizing based on behavior versus operating volume, Categorizing based on burden x behavior functions, Cost Estimating Techniques, Analogous Estimating, Parametric Estimating, Three Point Estimating, Bottom-Up Estimating, Time – Cost Association, Cost Crashing
7	20th November	Lecture 6 – Cost Management - Continued	Cost Management Process, Determine Budget, Project Budget Components, Project Budget, Contingency and Management Reserves, Differences Between Contingency and Management Reserves, Cost Control, Cost Baseline Plan, The Definition of Earned Value Management, Terminology of Earned Value Management, Values - Planned Value, Earned Value, Variances - Schedule Variance, Cost Variance, Indices – Schedule Performance Indicator, Cost Performance Indicator, Estimates concerned with Completion – Budget at Completion, Estimate at Completion, Estimate to Completion, Variance at Completion, Example Question, Benefits and Limitations of Earned Value Management
8	27th November	Lecture 7 – Risk Management	The Definition of Risk, Decision-Making, Framing, Bounded Rationality, Herd Mentality, Availability Heuristic, Dunning–Kruger Effect, Framing Effect, Confirmation Bias, Curse of Knowledge, Reactance Theory, Sunk Cost Fallacy, Hindsight Bias, Anchoring Bias, Cultural Bias, The Motivation of Risk Management, The Benefits of Risk Management in Project Management Context, Hard Benefits, Soft Benefits, Risk Management Process, Risk Strategy, Risk Identification, Identify Risk Events/Consequence Scenarios,

			Risk Mapping, Risk Classification, Qualitative Risk Identification Techniques, Checklist, Brainstorming, Interviews, Preliminary Hazard Analysis, SWOT Analysis, Delphi Method
9	4th December	Lecture 7 – Risk Management - Continued	Risk Management Process, Risk Analysis, Sensitivity Analysis, Expected Monetary Value Analysis, Weighted Attribute Method, Monte Carlo Simulation, Risk Response, Risk Avoidance, Risk Acceptance, Risk Monitor and Prepare, Risk Mitigation, Risk Transference, Risk Control
10	13th December	Lecture 8 – Engineering Economics	Engineering Economics, Why Engineering Economics are Important to Engineers? Time Value of Money, Important Rates in Engineering Economics, Discount Rate, Inflation Rate, Interest Rate, Effective Interest Rate, Simple and Compounding Interest Calculation, Cash Flow, Single Payment, Present Value, Future Value, Perpetuity, Annuity
11	20th December	Lecture 8 – Engineering Economics – Continued Lecture 9 – Project Finance	Net Benefit, Marginal Principle, Cost - Benefit Plot, Multiple Projects Evaluation Methods, Net Present Value Payback Period, Discounted Payback Period, Benefit – Cost Ratio, Incremental Benefit – Cost Ratio, Internal Rate of Return, Profitability Index, Project Finance, Build-Operate and Transfer, Private Finance Initiative, Financial Models and Project Finance, The Definition of Project Finance, Key Features of Project Finance, Special Purpose Vehicle, Non or limited recourse funding, Off balance sheet transaction, Differentiating Project Finance from Corporate Finance, Typical Structure
12	27th December	Lecture 10 – Contract Management	Motivation, Definition of Contract, The Definition of Contract Management, Why Contract Management is Important, Contractual Arrangement in Construction Industry, Contract Types, Contract types based on financial model, Build-operate and transfer, Construction agreement in return for land share, Contract types based on main contractor structure (power initiative), Joint Venture, Consortium, Differences between joint venture and consortium, Contract types based on sub-contractor structure, Sub-contractor and Main Contractor, Contract types based on contract forms, Standard and Non-Standard Forms of Contract, Advantages of Standard Contract Forms, Standard Contract Forms – Public Procurement Contracts, Standard Contract Forms – FIDIC, Contract types based on project delivery systems, Relations between stakeholders in contract management, Single contractor based contracts, Multi contractor based contracts, Traditional Management, Design and Build (D&B), Management Contracting (MC), Construction Management (CM), Contract Management, Contract types based on payment types, Fixed-Price (Lump-Sum) Contracts, Fixed-Price Contracts – Firm Fixed Price (FFP) Contracts, Fixed-Price Contracts – Fixed Price Incentive Fee (FPIF) Contracts, Fixed-Price Contracts – Fixed Price with Economic Price Adjustment (FP-EPA) Contracts, Cost-Reimbursable Contracts, Cost plus percentage of cost (CPPC), Cost plus fixed fee (CPFF), Cost plus incentive fee (CPIF), Cost plus award fee (CPAF), Time and Materials Contract
13	3rd January	Final Examination	