

FARWESTERN UNIVERSITY
FACULTY OF ENGINEERING
MASTER OF SCIENCE DEGREE IN CONSTRUCTION PROJECT MANAGEMENT

Course Title: **Advanced Engineering Economics**

Course Code: CPM 623

Year/Semester: I/II

Class Load: 4 hours per week (Theory: 4 Hrs.)

Credits: 4 (60 Hrs)

Evaluation:

	Theory	Practical	Total
Internal	40	-	40
Final (External)	60	-	60
Total	100	-	100

Course Descriptions and Objective:

The objective of this course is to provide student's enhanced understanding of various tools and techniques of engineering economy in managing construction project. After completion of this course students will be able to apply the acquired knowledge and skill of engineering economy into real practice in managing construction projects

Course Contents:

UNIT 1: Introduction (6 Hrs.)

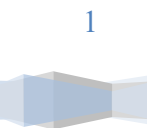
- 1.1 Law of demand
- 1.2 Law of diminishing marginal utility
- 1.3 Elasticity of demand
- 1.4 Law of supply
- 1.5 Equilibrium of demand and Supply
- 1.6 Principles of engineering economics
- 1.7 Role of engineering economy in decision making

UNIT 2: Time Value of Money (8 Hrs.)

- 2.1 Interest rate and rate of return
- 2.2 Simple interest and compound interest
- 2.3 Nominal interest rate and effective interest rate
- 2.4 Continuous compounding
- 2.5 Development of compound interest formulas for equivalence calculation: single cash flow, uniform series, linear gradient, uniform gradient, discrete compounding and discrete cash flow, continuous compounding and discrete cash flows, continuous compounding and continuous cash flow
- 2.6 Cash flow and cash flow diagram

UNIT 3: Evaluation of Alternatives by Economic Analysis (12 Hrs.)

- 3.1 Minimum attractive rate of return
- 3.2 Payback period analysis: simple and discounted
- 3.3 Present worth analysis: having equal life alternatives, and different life alternatives by repeatability assumption, co-terminated assumption, and capitalized worth method
- 3.4 Future worth analysis
- 3.5 Annual worth analysis



- 3.6 Benefit cost analysis: conventional B/C ratio, Modified B/C ratio, and incremental B/C ratio.
- 3.7 Rate of return analysis: internal rate of return, and external rate of return of single and mutually exclusive project

UNIT 4: Cost Analysis (10 Hrs.)

- 4.1 Cost concept
- 4.2 Elements of cost
- 4.3 Cost terminology: fixed cost, variable cost, direct cost, indirect cost, overhead cost, Average cost, Total cost, life cycle cost, historical cost, standard cost, sunk cost, opportunity cost, marginal cost, cash cost versus book cost, manufacturing cost and non-manufacturing cost, operation and maintenance cost
- 4.4 Relationship of MC, AVC, AFC, ATC
- 4.5 Breakeven analysis
- 4.6 Cost function: short-run cost function and long-run cost function

UNIT 5: Inflation (8 Hrs.)

- 5.1 Concept of inflation
- 5.2 Effects of inflation
- 5.3 Measure of inflation: consumer price index, wholesale price index, and gross domestic product deflator
- 5.4 Equivalence calculation under inflation
- 5.5 Equipment cost: buy, rent and lease options
- 5.6 Replacement analysis

UNIT 6: Depreciation (8 Hrs.)

- 6.1 Causes of depreciation
- 6.2 Methods of Depreciation: straight line method, declining balance method, double declining balance method, switching from declining balance method to straight line method, sinking fund method, sum of the year digit method, unit of production method, modified accelerated cost recovery system (MACRS)

UNIT 7: Risk and Decision Making (8 Hrs.)

- 7.1 Concept of risk
- 7.2 Describing project risk
- 7.3 Sensitivity analysis
- 7.4 Scenario analysis
- 7.5 Breakeven analysis
- 7.6 Decision tree analysis

PLAGIARISM

Plagiarism means copying or using other' ideas or work without acknowledging the original source and/or author. This can be in a variety of forms, from directly quoting someone without acknowledgment, copying and pasting from any available sources including internet, changing some words without acknowledgment and etc. This type of activities of a student in submitting any assignment will be considered as a serious offence and the university/course instructor will take serious action.



Indicative References:

1. Chain S. Park, *Contemporary Engineering Economics*, Prentice Hall Inc.
2. E. Paul De Garmo, William G. Sullivan and James A. Bontadelli, *Engineering Economy*, MC Milan Publishing Company.
3. James L. Riggs, David D. Bedworth and Sabah U. Randhawa, *Engineering Economics*, Tata MCGraw Hill Education Private Limited.
4. N. Gregory Mankiw, *Principles of Economics*, Thomson, South-Western.



FARWESTERN UNIVERSITY
FACULTY OF ENGINEERING
MASTER OF SCIENCE DEGREE IN CONSTRUCTION PROJECT MANAGEMENT

Course Title: **Principles and Practices of Construction Project Management**

Course Code: 622

Year/Semester: I/II

Class Load: 4 Hrs. per Week (Theory: 4 Hrs.)

Credits: 4 (60 Hrs)

Evaluation:

	Theory	Practical	Total
Internal	40	-	40
Final (External)	60	-	60
Total	100	-	100

Course Descriptions and Objective:

The objective of this course is to provide students enhanced understanding of the role and functions of management and introduction to various management theories and techniques they use to carry out their work in various capacities in managing construction projects.

Course Contents:

UNIT 1: Introduction (10 Hrs.)

- 1.1 Historical development and globalization
- 1.2 Introduction to management and organization
- 1.3 Organization culture diversity and ethics

UNIT 2: Planning (12 Hrs.)

- 2.1 Meaning, importance and types of planning
- 2.2 Strategic planning and business plan
- 2.3 Decision-making

UNIT 3: Organizing (16 Hrs.)

- 3.1 Perception
- 3.2 Leadership and team building
- 3.3 Motivation
- 3.4 Human Resource Management
- 3.5 Managing change and innovation

UNIT 4: Industrial and Labor Relations (10 Hrs.)

- 4.1 History and basic concept of industrial relations
- 4.2 Role and functions of trade unions
- 4.3 Workers participation in management
- 4.4 Wage, industrial dispute, employee discipline and grievance handling
- 4.5 Law and policies regulating industrial and labor relations

UNIT 5: Industrial and Labor Relations (12 Hrs.)

Covering wide range of management related issues; each student prepares a research report (30 pages), submits report and gives a seminar.

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Indicative References:

- 1.0 Hill, Charles W. L. and McShane, Steven, Principles of Management, Tata McGraw-Hill Education Pvt. Ltd
- 2.0 Kreitner, Robert, Management, AITSB, Delhi
- 3.0 Robbins, Stephen P., and Coulter, Mary, Management, Prentice-Hall of India, New Delhi
- 4.0 Griffin, Ricky, Management, Houghton-Mifflin, USA
- 5.0 Agrawal, Govind Ram, Principles of Management in Nepal, M. K. Publishers & Distributors, Kathmandu,
- 6.0 Human Resource Management, University of Minnesota Libraries Publishing through the eLearning Support Initiative.<http://open.lib.umn.edu/humanresourcemanagement/>
- 7.0 Stephen P. Robbins, Organizational Behavior, Prentice Hall
- 8.0 Organization Behavior, Center for Open Education, <https://open.umn.edu/opentextbooks>
- 9.0 David R. McClean, Strategic Planning As Simple as ABC, Lulu Publishing Services
- 10.0 C. S. VenkataRatnam, Industrial Relations, Oxford, India
- 11.0 P. R. N. Sinha, Industrial Relations, Trade Unions and Labor Legislation, Pearson, India
- 12.0 Relevant laws and policies
- 13.0 भरतमोहन अधिकारी, नेपालमा औद्योगीकरणका समस्या, रत्न पुस्तक भण्डार, नेपाल
- 14.0 Business 360°, Nepal
- 15.0 Journal of Management and Development Studies, Nepal Administrative Staff College
- 16.0 IIMB Management Review, IIM, Bangalore, India
- 17.0 Harvard Business Review

FARWESTERN UNIVERSITY
FACULTY OF ENGINEERING
MASTER OF SCIENCE DEGREE IN CONSTRUCTION PROJECT MANAGEMENT

Course title: **Quantitative Techniques in Construction Project Management**

Course Code: 621

Year /Semester: I/II

Class Load: 4 hours per week (Theory: 4 hours).

Credits:4 (60 Hrs)

Evaluation:

	Theory	Practical	Total
Internal	40	-	40
Final (External)	60	-	60
Total	100	-	100

Course Descriptions and Objective:

The objective of this course is to strengthening students' understanding of system engineering/ operation research knowledge to acquire relevant skill for applying them into real practice in managing construction projects.

Course Contents:

UNIT 1: Introduction and uses (32 Hrs.)

Historical Background of Operation Research and Applications

Linear Programming: Graphical Method, Solution by Graphical Method,

Simplex Method: Basic Requirements of LP, General LP Problem, Use of Artificial Variables, Problems and Solutions.

UNIT 2: Duality in Linear Programming (4 Hrs.)

Duality Theorem, Economic Interpretation of Dual Variables, Problems

UNIT 3: Integer Programming (4 Hrs)

Nature of the Problem, Methods: Branch and Bound, Cut Algorithm

Examples

UNIT 4:Transportation Model (4 Hrs.)

Structure of the Problem, Methods for Initial solution, Vogel's Approximation method, North West Corner Method, Other Methods, Examples

UNIT 5: Assignment Model (4 Hrs.)

Formulation, Hungarian Method, Examples

UNIT 6: Queuing Model (4 Hrs.)

Introduction, Queuing Theory, Formulae, Problems

UNIT 7: Dynamic Programming (4 Hrs.)

Introduction, Queuing Theory, Formulae, Examples

UNIT 8: Statistics, Probability and Uses (4 Hrs.)

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Indicative References:

- 1 Taha, Hamdy, Operation Research, Tata McGraw Hill Publishing Company, New Delhi, India.
- 2 Vohra, N D, Quantitative Techniques in Management, Tata McGraw Hill Publishing Company, New Delhi, India.
- 3 Shenoy, G V., Linear Programming :Methods and Applications, Wiley Eastern Ltd., New Delhi
- 4 Bronson, Richard, Theory and Problems of Operations Research, Schaum's Outline Series, McGraw Hill Book Company, Singapore.