



GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering

Subject Code: 3721404

Project Risk Analysis and Mitigation Techniques

2nd SEMESTER

Type of Course: Elective

Prerequisite: NIL

Rationale: Students would be able:

- To understand different aspects of risk associated with construction projects
- To know mitigation techniques available for construction projects
- To judge best fit mitigation technique for a specific risk under certain circumstances of construction project

Teaching and Examination Scheme

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE	PA(M)	Viva	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	General Importance of Risk, types of risks, quantifiable and unquantified risks, quantifiable and un-quantifiable risks, Micro, market, project level risk analysis approach	07
2	Risk analysis and Management for projects (RAMP) Identifying risk events. Probability distribution. Stages in Investment life-cycle; determination of NPV and its standard deviation for perfectly co-related, moderately co-related and un-correlated cash flows. Sensitivity analysis, scenario analysis simulation, decision tree analysis, risk profile method, certainly equivalent method; risk adjusted discount rate method, certainty index method, 3 point estimated method; use of risk prompts, use of Risk Assessment tables, details of RAMP process, utility of Grading of construction entities for reliable risk assessment.	16
3	Risk Mitigation Techniques Elimination, reducing, transferring, avoiding, absorbing or pooling. Residual risk, mitigation of unquantified risk. Coverage of risk through CIDC's MOU with the Actuarial Society of India through risk premium Such as (BIP) - Bidding Indemnity Policy (DIMO) - Delay in meeting obligation by client policy, (SOC) - Settlement of claims policy (LOP)- Loss of profit policy (TI). Transit Insurance policy (LOPCE), Loss of performance of construction equipment policy.	16



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Reference Books:

1. Industrial Engineering and Management of manufacturing systems. Dr.Surendra Kumar, Satya Prakashan
2. RAMP Handbook by institution of Civil Engineers and the faculty and Institute of Actuaries- Thomas Telford publishing, London.
3. Construction Engineering and Management – Seetharaman
4. Projects Planning analysis selection implementation and Review - Prasanna Chandra
5. Project Risk Analysis and Management Guide by John Barlett, APM Publishing Ltd

Course Outcome:

Sr. No.	CO statement	Marks % weightage
CO-1	Students would able to comprehend risk assessment techniques	20%
CO-2	Students would able to apply various aspects of risk management	40%
CO-3	Students would able to identify risk events and apply risk mitigation techniques	40%

List of Tutorials:

Assignment work is based on above subjectcontents. Assignment work:

- 1) Net present Worth.
- 2) Perfectly co related, moderately co-relations & uncorrelated cash flows.
- 3) Scenario analysis
- 4) Sensitivity analysis
- 5) Risk Profile methods
- 6) Certainty Equivalent Method
- 7) Risk adjusted discount rate method
- 8) Certainty index method
- 9) 3 point estimated method
- 10) Use of risk assessment tables.

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	25	20	20	15	10

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above