

<b>Course title:</b> Risk Analysis and Implementation Management				
<b>Course code:</b> BSI 185	<b>No. of credits</b> 3	<b>L-T-P distribution:</b> 36-06-0	<b>Learning hours:</b> 42	
<b>Pre-requisite course code and title (if any) :</b> None				
<b>Department:</b> Department of Business Sustainability				
<b>Course coordinator(s):</b>		<b>Course instructors(s):</b>		
<b>Contact details:</b>				
<b>Course type:</b> Elective		<b>Course offered in:</b> Semester 2		
<b>Course description</b> This course provides a holistic view of risks associated within and across infrastructure projects, including the emergent and resource-based sectors. The content focuses on strategies and implementation management that can be utilized to create a strong risk culture across projects for evaluating potential risks to ensure problems are identified at an early stage. This would further help to avoid reworks and delays which can cause cost overrun.				
<b>Course objectives</b> Public and private sector executives tasked with the delivery of major infrastructure projects will have the answers to the problems they face when looking to integrate risk into the design and delivery of their infrastructure project.				
<b>Course content</b>				
<b>Module</b>	<b>Topic</b>	<b>L</b>	<b>T</b>	<b>P</b>
1.	<b>Risk management process</b> Success of infrastructure projects is greatly influenced by proper management of risk associated with the projects through adoption of appropriate risk management framework. This module will create an awareness among students about different stages of risk management process. It includes: <ul style="list-style-type: none"> <li>• Risk identification</li> <li>• Risk assessment</li> <li>• Risk allocation</li> <li>• Risk mitigation</li> </ul>	2	0	0
2.	<b>Risk measures techniques</b> Though the awareness of risk management process is necessary but is not sufficient enough. In order to do appropriate project risk analysis, students need to understand various techniques applied for measurement of risk. This module facilitates to understand the perspective and quantum of risk associated with projects and how is risk analyzed and assessed in practice. It covers: <ul style="list-style-type: none"> <li>▪ Sensitivity analysis</li> <li>▪ Scenario analysis</li> <li>▪ Break even analysis</li> <li>▪ Simulation analysis</li> <li>▪ Decision tree analysis</li> <li>▪ Network analysis</li> <li>▪ Value at Risk (VaR)</li> <li>▪ Risk modelling</li> <li>▪ Risk software</li> </ul>	3	1	0
3.	<b>Strategy implementation</b> Strategy is about winning. The role of strategy in success has to be understood carefully. Strategy implementation is inherent in project implementation. This module provides the basic understanding of the role of various components of strategy in project implementation. Students are exposed to these concepts in order to comprehend the theoretical	3	1	0

	<p>framework of project implementation.</p> <ul style="list-style-type: none"> <li>▪ The concept of strategy</li> <li>▪ Goals, values and performance</li> <li>▪ Business and industry environment: The fundamentals</li> <li>▪ Analyzing resources and capabilities: Understanding the internal environment</li> <li>▪ Developing resources and capabilities</li> <li>▪ Organization structure and management systems: The fundamentals of strategy implementation</li> </ul>			
4.	<p><b>Implementation management</b></p> <p>A transformation process uses resources to convert inputs into some desired outputs. Physical as well as service infrastructure projects involved transformation process; for example, physical (in manufacturing), location (In transportation), exchange (in retailing), storage (in warehousing), physiological (in health care), informational (in telecommunication). This module provides an understanding of various businesses in order to identify the risk involved in these businesses. It includes</p> <ul style="list-style-type: none"> <li>▪ Transformation processes</li> <li>▪ Operations strategy and competitiveness</li> <li>▪ Product design</li> <li>▪ Process analysis</li> <li>▪ Facility location</li> <li>▪ Facility layout</li> <li>▪ Strategic capacity management</li> <li>▪ Project management</li> <li>▪ Operations technology</li> </ul>	3	0	0
5.	<p><b>How project structures create value</b></p> <p>The structural attributes of infrastructure projects enable students to find out financial and other resources of projects that enable lenders and equity holders to invest substantial funds. In this module student shall develop rationale for various types of contracts and models that form the backbone of project financing transactions.</p> <ul style="list-style-type: none"> <li>▪ Structural Attributes</li> <li>▪ Project Organization Structure</li> <li>▪ Contracts and Models</li> <li>▪ Economic Impact of Infrastructure Project – The ERR</li> <li>▪ Complexities in Valuing Large Projects</li> </ul>	2	1	0
6.	<p><b>Managing risks in infrastructure sector</b></p> <p>This module looks at various risks like construction risk involving cost overrun, time overrun, and other risks like operating risk, market risk, interest risk, foreign exchange risk, payment risk, regulatory risk, political risk <i>etc.</i> Hence, the students shall understand various types of risks involved and how to manage them. This will discuss;</p> <ul style="list-style-type: none"> <li>▪ Construction Risk-Time over run, Cost overrun</li> <li>▪ Operating Risks</li> <li>▪ Market Risks</li> <li>▪ Interest Rate Risks</li> <li>▪ Foreign Exchange Risks</li> <li>▪ Payment Risks</li> <li>▪ Regulatory Risks</li> <li>▪ Political Risks</li> <li>▪ Right of way</li> </ul>	3	0	0

7.	<p><b>Managing cost risk and uncertainty in infrastructure projects</b></p> <p>This module looks at the management of cost risk and uncertainty throughout the project life cycle for mitigating of risks. It also addresses the practical challenges around the financial estimation of risk. Students, in this module shall understand the challenges related to risks in real and practical situations of infrastructure projects. It covers;</p> <ul style="list-style-type: none"> <li>▪ Exploring the challenges</li> <li>▪ The project life cycle and risk</li> <li>▪ Useful tools and approaches</li> <li>▪ Forward program</li> <li>▪ Risk breakdown structures</li> <li>▪ Recommendations</li> </ul>	4	2	0
8.	<p><b>Common language is essential to communications about uncertainty and its management</b></p> <p>It is essential to communicate to students, the concepts clearly and unambiguously. In this module, attempt has been made to explain “defined terms” to ensure clarity to this course. We shall start with explanatory overview and then present a definition for each specialist term. This module provides to students the meaning and understanding of about fifty definitions and terminologies used in this course. It covers;</p> <ul style="list-style-type: none"> <li>▪ Overview</li> <li>▪ Glossary listing</li> <li>▪ Case study</li> </ul>	3	0	0
9.	<p><b>Project and emerging risks in infrastructure financing</b></p> <p>Cross-border infrastructure financing requires that projects participant assume certain risks in addition to those common to infrastructure projects including the currency risk, political risk, tax policies, economic sensitivity, limited remedies and others. This module will help the students to understand the emergent risks along with project risk involved in cross border infrastructure projects. It includes;</p> <ul style="list-style-type: none"> <li>• Risk management in project finance</li> <li>• Nature of credit risk and project finance</li> <li>• Refinancing risk</li> <li>• Institutional sharing of risk origination and risk taking-syndicated loan market</li> <li>• Emerging risk and credit rating</li> <li>• Debt rating criteria</li> <li>• Key issues in emerging markets</li> </ul>	3	1	0
10.	<p><b>Risk management in resource sector infrastructure projects</b></p> <p>Resource sector is termed as an infrastructure sector dealing with natural resources like coal, metal and mining. This module deals with conducting risk assessments and integration of risk and value management for resource sector infrastructure projects. Students are exposed to assimilate this risk assessment methodology used for sector-specific projects. It will discuss;</p> <ul style="list-style-type: none"> <li>▪ Planning and conducting risk assessments in advance of appropriate project milestones or activities to allow identification and resolution of risks without disrupting the project schedules</li> <li>▪ The integration of risk and value management as inputs into a robust decision - making process</li> <li>▪ Understanding the effects of uncertainty on project Objectives</li> </ul>	3	0	0

	<ul style="list-style-type: none"> <li>▪ Approaches taken to manage the project planning and controls on a project</li> </ul>			
11.	<p><b>Risk sensitive investment and resilient infrastructure</b></p> <p>This module deals with risk rating criteria of projects. It also deals with the disaster management and effect of climate risk in infrastructure projects. The students shall be required to add the said aspects in their knowledge of risk management of infrastructure projects. It includes;</p> <ul style="list-style-type: none"> <li>▪ RISE initiative – Risk sensitive investment</li> <li>▪ UN disaster resilient scorecard</li> <li>▪ Integrating climatic risk into infrastructure projects</li> <li>▪ Pricing risk and resilience into design</li> <li>▪</li> </ul>	2	1	0
12.	<p><b>An integrated approach to a successful infrastructure project – Initiation, Financing and Execution</b></p> <p>Major infrastructure projects have got certain inherent problems. Cost overruns, delays, failed procurement, unavailability of private financing are common. In this module, discussion will take place on good risk - informed project management across the value chain in order to give clear picture to students about the difference between good and badly design infrastructure projects.</p> <ul style="list-style-type: none"> <li>▪ Challenges for large scale projects</li> <li>▪ Some typical causes of failure</li> <li>▪ Project risk across the Infrastructure Life Cycle -(ERM)</li> <li>▪ Selecting, planning and design phase</li> <li>▪ Procurement and contractual design choices</li> <li>▪ Construction delivery</li> </ul> <p>Asset operation</p>	3	0	0
13.	<p><b>Cutting through barriers to infrastructure project success</b></p> <p>The content in this module provides the holistic view of key infrastructure projects and latest techniques of managing various types of risks. Students will become familiar with the latest thinking and trends in this area. It explains;</p> <ul style="list-style-type: none"> <li>▪ Innovation (and its barriers)</li> <li>▪ Finance</li> <li>▪ Procurement practices</li> <li>▪ Policy and planning risk</li> <li>▪ Skills availability</li> </ul>	3	0	0
	<b>Total</b>	<b>36</b>	<b>6</b>	<b>0</b>
<p><b>Evaluation criteria</b></p> <ul style="list-style-type: none"> <li>• Test 1: Class participation                      10%</li> <li>• Test 2: Project                                        30%</li> <li>• Test 3: Written Test                                20%</li> <li>• Test 4: Written Test                                40%</li> </ul>				
<p><b>Learning outcome:</b></p> <ul style="list-style-type: none"> <li>▪ An understanding of the risk management processes and techniques in today's context</li> <li>▪ An understanding of project risks and emerging risks in infrastructure financing</li> <li>▪ The capability to be able to assess and suggest ways and means to address the practical challenges around the financial estimation of risk in infrastructure projects.</li> </ul>				
<b>Pedagogical approach:</b>				

A combination of class-room interactions, tutorials, assignments and projects.

**Reading Materials:**

***Suggested Readings:***

- *Project Finance in Theory and Practice* by Stefano Gatti, Elsevier, Academic Press (2018)
- *Corporate Finance* by Ross, Westerfield & Jaffe, Mc Graw Hill, 12<sup>th</sup> ed. (2019)

***Additional Readings:***

- Journal articles, Case Studies and other relevant information As and when provided/suggested by the course instructor

**Additional information (if any)**

**Student responsibilities**

Attendance, feedback, institutional discipline, research ethics

**Prepared By:**

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**Course reviewers:**

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