OPIM 342 Operational Risk Management
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COURSE DESCRIPTION
All organizations bear operational risks in order to achieve their objectives. Operational risk is defined as the risk of loss from operation failure. Compared to other types of risk, such as credit, underwriting, and innovation risk, operational risk is perhaps the most fundamental and significant one. Why? Operational risk is highly asymmetrical in nature, because of the potential for very large losses due to extreme events (though these are usually few in number). Precisely because extreme events are so rare relative to other risk types, they are very difficult to assess. For organizations motivated by profit, a net positive return is required by shareholders. Operational risk therefore is a key concern of both internal and external stakeholders.

The course will give students an overview of which operational risks are prevalent in various industries and what tools and techniques can be used to identify, quantify and control operational risks. Besides learning the basics of probability and statistical theories, students will become familiar with the risk analysis framework and will conduct a risk analysis using either Oracle's Crystal Ball software or @Risk from Palisade. Students will also be introduced to various regulatory requirements.

LEARNING OBJECTIVES
By the end of this course, students will be able to:
• Identify and define the boundaries of Operational Risk Management
• Understand the framework and methodologies used for quantifying and modelling risk in industry
• Learn about the phylogenetic methods that are used to explore the emergence of new operational risks
• Understand and be able to use the tools of the trade for conducting risk analysis
• Understand the basics of the regulatory requirements that exist in the financial sector and heavy industries
• Learn how operational risks are managed and controlled in a volatile environment

PRE-REQUISITE/ CO-REQUISITE/ MUTUALLY EXCLUSIVE COURSE(S)
Please refer to the Course Catalogue on OASIS for the most updated list of pre-requisites / co-requisites for this particular course.

Do note that if this course has a co-requisite, it means that the course has to be taken together with another course. Dropping one course during BOSS bidding would result in both courses being dropped at the same time.

ASSESSMENT METHODS
Class Participation: 10 % (Throughout the term)
Group Assignments:
1. Case Study & Discussions 15% (4 Case Studies @ 5% each)
2. Case Study write-ups 05% (2 Case Studies @ 5% each)
3. Project 20%
4. Simulation Exercise* 20% (Subject to availability)
Final examination: 30 % (Week 15)
Total: 100%

*Simulation Exercise will be subject to availability and could be substituted by 2 X MCQ Quiz for 10% each
ACADEMIC INTEGRITY
All acts of academic dishonesty (including, but not limited to, plagiarism, cheating, fabrication, facilitation of acts of academic dishonesty by others, unauthorized possession of exam questions, or tampering with the academic work of other students) are serious offences.

All work (whether oral or written) submitted for purposes of assessment must be the student's own work. Penalties for violation of the policy range from zero marks for the component assessment to expulsion, depending on the nature of the offence.

When in doubt, students should consult the course instructor. Details on the SMU Code of Academic Integrity may be accessed at http://www.smuscd.org/resources.html.

INSTRUCTIONAL METHODS AND EXPECTATIONS
The course will be a combination of lectures and case discussions.

Lectures
The In-class Final Exam will be based on lecture materials.

Class Participation
Participation is a central part of the learning process for you and your classmates. When you contribute, you help others learn. Your participation mark reflects your contribution to your classmates learning. This includes attendance, full preparation prior to class including reading assigned materials and completion of mini assignments, and active participation in class discussions and group activities.

Groupings and group size
Please form groups of between four and six. You are encouraged to find your own group members. The group-member list should be submitted to the TA no later than 2nd class of the course.

Group Case Discussion and Presentation (week 3 to week 12)
Each week, one or two groups will be presenting their own complete analysis of the same case (through a 30 minute presentation). During the presentations, the two groups will lead the class discussion of the case. This requires the groups to stimulate interest and draw out insights and ideas from the class creating active participation of class members who are expected to have read the case and thought about the assigned questions. The discussion will be facilitated by the instructor.

In addition to presentation materials, each group must submit a written analysis for its case. The written analysis is limited to five pages (double space) plus exhibits. Written papers are due at the beginning of the class. The contents of written papers should be in the conjunction with your group’s presentation.

A set of study questions to each case will be given two weeks prior to your group’s presentation. The study questions only serve as a starting point. Additional (creative) insights will be welcomed.

One-page Case Summary
All groups are expected to have read the case and reflected upon the assigned questions. Each group who is not in the presenting groups of the week is to prepare a one-page write-up for the assigned questions (three in total). These summaries are due at the beginning of each class. NO EMAILS!

Group Project and Presentation (Week 13)
The objective of the project is to allow you to conduct research into a particular area which is relevant to risk management. In many ways, this is great practice for consulting projects (internal or external). The potential topics are very wide. You should choose a topic that you are keen to know more about, and delve into it. Group project topics are due by the beginning of 2nd class of the course.

This exercise is important in that, as a group, you must also navigate sources of information and you must integrate aspects of real-world data reporting (which might be biased or incomplete). Operational Risk is more than a quantitative issue in business. Your role as a manager of Operational Risk will include many presentations and research activities. This project is also meant to simulate these real-world requirements. The group project should be 15-20 pages in length, double-spaced, one-sided, with appendices not included in the page count. Sources and information should be well documented with footnotes and bibliographies, as if you were presenting to a client. Credible sources are important. Additionally, the groups should present a 5-10 slide presentation to share with the class. The presentation should last 10 minutes or so and will be scheduled before the final exam section.
opportunity that our classroom offers in allowing all to practice presentation and learn from each other is invaluable. Non-presenting students are expected to participate with questions and attention. Class participation includes participation in attending and presenting. Please provide me with a hard copy of the PowerPoint slides during class and a soft copy of the slides before or right after your presentation.

**Examinations**

There will only be a cumulative final exam. The exam will be a case study(ies) and MCQ-based open-book and open-notes exam and will focus on the materials covered in class. No make-up exams will be allowed without prior permission.

I expect all of you to follow the school’s examination policy. Among other things, you need to bring your own calculator(s) to the exams; you are not allowed to share calculator(s) with one another; you also need to silence your cell phone and keep it away from the desk during the entire duration of the exams.

**RECOMMENDED TEXT AND READINGS**

**Required Readings and Cases**

A course packet will offer access to hard or soft copies for the required readings and cases for the course. Any additional reading material referenced in the class will be made available before the class.

**CLASS SCHEDULE**

<table>
<thead>
<tr>
<th>Week No.</th>
<th>Topic</th>
<th>Cases and Readings</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction to Operational Risk</td>
<td>Piedmont Airlines: Discount Seat Allocation</td>
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<td>2</td>
<td>Introduction to Probability and Statistics</td>
<td>Understanding Corporate-Value-at-Risk through a Comprehensive and Simple Example</td>
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<td>3</td>
<td>Identification and Assessment of Operational Risks: Part I</td>
<td>Intel: Strategic Decisions in Locating a New Assembly and Test Plant</td>
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<td>4</td>
<td>Identification and Assessment of Operational Risks: Part II</td>
<td>Nokia’s Supply Chain Management</td>
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<td>5</td>
<td>Building Risk Analysis Models</td>
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<td>6</td>
<td>Supply Chain Disruptions</td>
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<td>7</td>
<td>Innovation Risks</td>
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<td>Recess</td>
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<td>9</td>
<td>Employee &amp; Environment Risks</td>
<td>ALCOA Workers Safety</td>
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<td>10</td>
<td>Reduction of Operational Risks</td>
<td>Fuel Hedging in the Airline Industry: The Case of Southwest Airlines</td>
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<td>11</td>
<td>Hedging and Regulatory Requirements</td>
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<td>12</td>
<td>Warranty and Performance based contracts</td>
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<td>13</td>
<td>Group Project Presentations</td>
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<tr>
<td>Week No.</td>
<td>Specific Learning Objectives for the Lesson</td>
<td>Concepts / Topics Covered Required Reading</td>
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| 1       | Introduction to Operational Risk  
This lecture will provide the motivation for why understanding and managing operational risk is important to the organization. | Overview of Operational Risk and its Occurrence in Various Industries  
Types of Risks and their evolution.  
Frameworks for Operational Risk Management | • Oral questioning during class. | • Ice breaker & Introduction (30 minutes)  
• Lecture (30 minutes)  
• 5 Questions to guide discussion. (15 minutes tea break)  
• Lecture (30 minutes)  
• Summary (15 minutes) |
| 2       | Introduction to Probability and Statistics  
Basics and concepts of probability theory and statistics.  
Introduction to Monte Carlo simulation.  
Homework Assignment questions will be based on the above case study | Financial Models to Measure Operational Risk  
Risk Factors and Profiling Approach  
Process Modelling: model all operations and identify how/when/where/why operations fail.  
Homework Assignment: Case Study: Understanding Corporate-Value-at-Risk through a Comprehensive and Simple Example | | Lecture (30 mins X 3)  
Hands on examples on probability and statistics(20 mins X 2)  
15 minutes tea break  
Monte Carlo Example (30 min x 1) |
| 3       | Identification and Assessment of Operational Risks  
A significant part of managing and understanding any risk, including operational risk comes through the identification and assessment of the risk. In these lectures, various widely used approaches for | | Review Assignment questions from Lecture 2 (30 mins X 2)  
Lecture (30 mins X 2 + 45 mins X 1)  
15 minutes tea break |
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<th>Session Details</th>
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<tr>
<td>4</td>
<td>Identification and assessment are presented. Although most methods are quantitative, often times the managers and analysts doing risk assessment generally do not have the needed data to build the most thorough and sophisticated models for risk assessment.</td>
<td>Statistical Modelling: Understanding the loss models and VaR concepts. Case Study: Understanding Corporate-Value-at-Risk through a Comprehensive and Simple Example Homework: Case Study: Intel: Strategic Decisions in Locating a New Assembly and Test Plant Review Case study assignment (60 mins X 1) Lectures (30 mins X 2) 15 minutes tea break Hands on example on VaR OR Loss Modelling (45 mins)</td>
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<td>5</td>
<td>Building Risk Analysis Models</td>
<td>Hands-on session where we will learn to create a risk model using Crystal Ball or @Risk. Based on the learning’s from the case study, we will create a model to determine to explore an optimum location for a “fictional company” to locate its new assembly plant. Case Study: Intel: Strategic Decisions in Locating a New Assembly and Test Plant Homework questions based on the Case Study + Case Study: Nokia’s Supply Chain Management Review Case study assignment (60 mins X 1) Lecture (30 mins X 1) 15 minutes tea break Hands on example on developing the model (75 mins X 1)</td>
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<td>6</td>
<td>Supply Chain Disruptions Due to the globalization, outsourcing &amp; single sourcing together with lean management, they have made the supply chains more complex and more prone to disruptions. This lecture will focus on what are the factors that increase the chances of disruptions and highlight some of the strategies used in managing disruptions using real-life examples.</td>
<td>Understand the effect of supply chain disruptions on corporate performance. What can the companies do to mitigate the risks of disruptions? What are the best practices in the industries to manage supply chain risks? Case Study Discussion: Nokia’s Supply Chain Management Oral questioning during class. Review Case study assignment (60 mins X 1) Lectures (30 mins X 2 + 45min X 1) 15 minutes tea break</td>
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<td>7</td>
<td>Innovation Risks New products and services that are introduced by the companies carry a great amount of risks. Just how risky an innovation turns out to be depends in great measure on the choices people make in using it.</td>
<td>What measures do company take to minimize their exposure? Oral questioning during class. Review Case study assignment (60 mins X 1) Guest Lecture: 30 mins X 1 + Guest Q&amp;A: 30 mins X 1 15 minutes tea break Lecture 45 mins X 1</td>
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<td>8</td>
<td>Mid-term Break</td>
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<td>9</td>
<td>Employee &amp; Environment Risks:</td>
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| 10 | Reduction of Operational Risks  
The goal of risk assessment is to improve how we react to risk and proactively reduce our exposure to it. In any case a reduction in risk involves costs. As such costs should be treated as investments against probability and exposure of the operational risks. Hedging and Insurance are some of the options available in certain industries. This lecture will explore some of the instruments available to mitigate risks. | Theoretical foundations for risk mitigation in financial and non-financial industries.  
Oral questioning during class.  
Lecture 60 mins X 2 + 45 Mins X 1  
15 minutes tea break |
| 11 | Hedging and Regulatory Requirements. | In-Depth look at how companies use hedging to mitigate the risks  
Case Study: Fuel Hedging in the Airline Industry: The Case of Southwest Airlines | Review Case study assignment (60 mins X 1)  
Lecture (30 mins X 1)  
15 minutes tea break  
Hands on example on developing the model (75 mins X 1) |
| 12 | Warranty & Performance based contracts | Understanding how companies offer warranties and sell goods that are priced based on the product performance (Aircraft Engines) | Group Discussion in two teams (60 mins X 1)  
Review the case questions (30 mins)  
15 minutes tea break  
Lecture (30 mins X 3) |
| 13 | Group Project Presentations |   |
| 14 | Study Break |   |
| 15 | Final Examination |   |