



## THE RISK MANAGEMENT CURRICULUM

OBJECTIVE	The aim of the Risk Management curriculum at Linköping University is to provide an analytic, systematic and critical attitude towards the management of risks in private and public enterprises. The foundation rests as much on the managerial as the mathematical-engineering paradigms and intends to raise the general awareness of the profession to facilitate the emergence of a stronger Risk Management corps in Scandinavia.
SCOPE	Risk Management (RM) is a discipline that deals with the identification, assessment and mitigation of causes and effects of uncertainty and risk on organizational or technical systems. Following a general RM introduction, courses are given in the sub-areas Financial RM, Technical RM, Human RM and other areas.
INSTRUCTION	The Department of Production Economics will offer a selection of multi-disciplinary courses on the topic in close collaboration with Department of Management and Economics, Department of Mechanical Engineering and the School of Medicine. The courses will initially be offered as executive education, gradually to be introduced in the Institute of Technology graduate programs. The program, initiated in 1996, is considered a priority area by the President of Linköping University.
DIRECTOR	Per Agrell, associate professor <sup>1</sup> , docent, per.agrell@ipe.liu.se.
FACULTY	Per Agrell, tekn. dr., dept of prod econ, LiTH. (PA) Thomas Ericsson, med dr, chief physiscian, dept of psychiatry, LiU. (TE) Georg Hellgren, assistant prof, dept of econ, LiU. (GH) Peter Hultman, assistant prof, dept of prod econ, LiTH. (PH) Karl E. Johansson, assoc. prof, dept of mech eng, LiTH. (Q)
ADJUNCT FACULTY	Experts and successful RM consultants give presentations in all courses.
COURSES	TXRM02 Risk Management, introduction, 10 cr TXRM01 Risk Financing, 5 cr TXRM03 Risk Management of Human Behavior, 5 cr TXRM04 Risk Management in Public Services, 5 cr TPPE81 Financial Risk Management, 3 cr
ORGANIZATION	All TXRM classes are given off campus during 2-day intensive seminars. The evening is spent for groupwork and projects and the days are devoted to lectures, demonstrations and presentations of projects. TPPE classes are offered to IE-majors at LiTH as a graduate requirement (finance major) or elective. Instruction given in Swedish or English, depending on participants.
EXAMINATION	Courses are examined through projects, assignments and a 3-day take-home exam (TXRM) or a 4-hour written exam (TPPE).

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<sup>1</sup> General manager of SUMICSID consulting, affiliated with CORE, Université de Louvain, Belgium.

## SELECTED LITERATURE

- Adams, J (1995) *Risk*, UCL Press, London.  
 Beaver, W H och G Parker (Eds.) (1995) *Risk Management: Problems & Solutions*, McGraw-Hill, NY.  
 van der Colk, H (1988) Risky Behaviour Resulting from Bounded Rationality, *Ergonomics* **31**(4), s 485-90.  
 Dougherty, D (1988) *Crisis Communication*, Walker, NY.  
 Erdman, P (1993) *Zero Coupon*, Tom Doherty Associates, NY  
 Molak, V (1997) *Fundamentals of Risk Analysis and Risk Management*. CRC Press, NY.  
 Williams, C A Jr, Smith, M L och P C Young (1995) *Risk Management and Insurance*, McGraw-Hill, NY.

In addition: Literature covering TQM in services, insurance regulation, legal excerpts, IT-security.

In Swedish:

- Grubbström, R W (1977) *Besluts och spelteori*, Studentlitteratur, Stockholm.  
 Grubbström, R W och Lundquist, Janerik (1996) *Investering och Finansiering - Metodik och tillämpningar*, Academia Adacta ,  
 Hamilton, G (1996) *Detta är Risk Management*, Studentlitteratur, Stockholm.  
 NUTEK (1992) *Riskbedömning - kunskaper om risker*, Nutek, Stockholm  
 SAF (1991) *Det sårbara företaget*, SAF, Stockholm.  
 SAF (1993) *Informationssäkerhet*, SAF, Stockholm.  
 Svensson, T (1994) *Företagens skydd och säkerhet*, Industrilitteratur, Stockholm.  
 Thorstenson, A och Rapp, B (1991) *Vem skall ta risken?* Studentlitteratur, Stockholm.  
 Östberg, G (1993) *Att veta vad man gör*, Carlssons förlag, Stockholm.

## EXERPTS FROM SYLLABI

### TXRM01 RISK FINANCING, 5 cr

97/98

TXRM01                      Introductory risk financing class, covering both the traditional insurance aspect and the financial instruments and models for 'up-side' risks. Focus on applications in spread-sheets and analysis tools. Requires a quantitative background.

<b>Risk modeling</b>	<b>PH</b>	<b>10</b>
<b>Insurance</b>	<b>PÅ</b>	<b>10</b>
<b>Captives and reinsurance</b>	<b>PÅ</b>	<b>10</b>
<b>Current developments: derivatives, new risk markets</b>	<b>PH</b>	<b>10</b>

### TXRM02 RISK MANAGEMENT, intr, 10 cr

1996 -

TXRM02                      Comprehensive course in RM, introduces terminology, practice and theory of the field. Heavy teaching focus on cases from industry, critical assessments and analysis. The crisis management real-time game covers product liability. The course ends with an extensive project to integrate the subjects and to expose the participants to various organizational problems. Requires a statistical background.

<b>Risk theory</b>	<b>PA</b>	<b>5</b>
<b>Decision theory</b>	<b>PA</b>	<b>5</b>
<b>Risk management as expertise</b>	<b>PA, LN</b>	<b>5</b>

<b>Risk analysis</b>	<b>RB, LN</b>	<b>13</b>
<b>Economics of risk</b>	<b>PÅ</b>	<b>6</b>
<b>Legal framework</b>	<b>GH</b>	<b>7</b>
<b>Crisis management</b>	<b>TE</b>	<b>6</b>
<b>Riskanalys, forts</b>	<b>RB m fl</b>	<b>5</b>
<b>IT and RM</b>	<b>GW</b>	<b>4</b>
<b>Integrated RM</b>	<b>LGF</b>	<b>10</b>

### **TXRM03 Risk Management of Human Behavior, 5 cr**

**1997 -**

TXRM03 Specialized course for RM of human resources in socio-technical systems. Reviews economic and medical theories behind human risk behavior before analyzing existing RM practices and legal frameworks for efficiency and effectiveness. Particular focus is paid to information technology risks in distributed systems and various managerial approaches.

<b>Risk perception and the incentive system</b>	<b>PA</b>	<b>10</b>
<b>Human behavior under stress and uncertainty</b>	<b>TE</b>	<b>10</b>
<b>Liabilities and employee rights legislation</b>	<b>GH</b>	<b>10</b>
<b>Applications: Man and information</b>	<b>PA, GH</b>	<b>10</b>

### **TXRM04 Risk Management in Public Services, 5 cr**

**1999**

TXRM04 An RM-primer for the public sector with all cases and examples from agencies, ministries and cities. The course offers a workshop in continuous improvement and quality management as change-enabler, in addition to the classical RM-tools. Term-project from the participants own employer.

<b>Risk analysis and continuous improvement</b>	<b>PA,Q</b>	<b>10</b>
<b>Risk theory. Economics of risk.</b>	<b>PA, LN</b>	<b>10</b>
<b>Crisis management</b>	<b>TE</b>	<b>10</b>
<b>Legal and moral obligations in the public services</b>	<b>GH</b>	<b>10</b>

### **TPPE81 Financial Risk Management, 3 cr**

**1999 -**

TPPE81 In-depths financial risk management. Reaches full fluency in the RM vocabulary as well as familiarity and skills in advanced RM topics such as hedging, derivatives, VAR, market models and portfolio management. Requires TPPE62 Financial Theory, graduate class at LiTH.

<b>Financial risks: a framework</b>	<b>PH</b>	<b>5</b>
<b>Traditional volatility and sensitivity measures</b>	<b>PH</b>	<b>5</b>
<b>Forecasting of risk: Factorial, time series and GARCH-models</b>	<b>PH</b>	<b>10</b>
<b>Portfolio management, -risk assessment and evaluation</b>	<b>PH</b>	<b>10</b>
<b>Value-at-Risk: numerical approaches. Linear - nonlinear derivatives. Back testing.</b>		
<b>RiskMetrics (and other products)</b>	<b>PH</b>	<b>10</b>

