

Detailed Course Information: Data in Insurance

Sl. No.	Data Type	Comments
1	Course Name	Why is data the heart of insurance business?
2	Content Source	Experience of Bee-Relevant collaborators in the insurance sector
3	Brief Description / Introduction of Course	<p>The objective of this course is to show-case that data needs a context to be effective. We depict the world of the insurance business and we explain the challenges and reasons why the insurance business should use data and should become more data-driven.</p> <p>This course allows any data expert expecting to work in the insurance sector to have the right understanding of the business. It also allows any insurance expert to understand what can be done and what cannot be done with data.</p>
4	Why do we need this course?	<p>For a fact, data is everywhere, is expanding and the technology helping to store and to play with data has been democratized. Nevertheless, it does not mean that the world of data is a plug and play; and that everyone can improvise to be a data expert in any type of business. There is nothing more dangerous for a leader to think that data is only a question of tool and that it does not require the hiring of good data experts with the right BUSINESS knowledge.</p> <p>And this observation is valid for the insurance business. The insurance business is already using data and statistical methods for decades... but at a reduced scale compared with what the technology can allow today.</p> <p>The reason why we need this course is that the insurance business is atypical in more than one dimension and that 'a fool with a tool is still a fool'! As consequence, any data expert working in the insurance world or any insurance expert working with data should be aware about the specificities of both worlds.</p>
5	Learning Outcomes	<ul style="list-style-type: none"> • <i>Introduce the concept of insurance with figures</i> • <i>Introduce the concept of risk</i> • <i>Introduce the concept of mutualization and risk pooling</i> • <i>Introduce the main challenges in the insurance sector (e.g., competition, inverted lifecycle or anti-selection)</i>

		<ul style="list-style-type: none"> • <i>Introduce the different types of insurance (non-life, life, reinsurance, etc.)</i> • <i>Deep-dive in the flow of a non-life insurance product from underwriting to renewal/lapse including claims handling and fraud detection</i> • <i>Deep-dive in the flow of a life insurance product from subscription to payment (with parallel with financial states)</i> • <i>Introduction of the regulation in the insurance sector in Europe and worldwide (e.g., Solvency II, IFRS 17, LGAAP)</i> • <i>Introduction of the notion of provisions</i> • <i>Introduction of ALM process in an insurance company</i> • <i>Potential business impacts thanks to data science usage (list of concrete examples with scenarios)</i> • <i>Use case on portfolio optimisation (with usage of machine learning techniques)</i> • <i>Use case on non-life pricing (with usage of machine learning techniques)</i>
6	Course Length	<i>4 Modules</i>
7	Estimated Effort	<i>2-3 hours/module (including homework and Q&A sessions)</i>
8	Prerequisites	<i>None</i>
9	Skills Acquired:	
	Module 1: Introduction to insurance	Market figures, risk types, risk handling, mutualization, large number rule, anti-selection, activities (non-life, life, reinsurance, etc.)
	Module 2: Deep-dive and regulation	Process of a non-life insurance product (different notions of premiums, brokerage, underwriting, renewal, claims handling and fraud), process of a life insurance product (parallel with a banking/financial product), regulation (SII, IFRS17 and LGAAP), different types of provisions, ALM process
	Module 3: The role of data science in insurance	Potential business impact of using data (on main KPIs such as #FTEs or GWP or costs), list of potential project areas cases with contexts
	Module 4: Practical use cases	Portfolio optimization using machine learning techniques, non-life pricing for a car insurance product using machine learning techniques

Module 1: Introduction to the Insurance sector

Lecture	Video Name
Lecture 1	Welcome to Module-1
Lecture 2	Market figures related to the insurance field
Lecture 3	Definition of insurance: the notion of risk
Lecture 4	Mutualization and pooling
Lecture 5	Challenges (competition, outliers, anti-selection, etc.)
Lecture 6	Insurance activities (non-life, life, reinsurance, etc.)
Lecture 7	Wrap up
Key Terms	<i>Insurance, risk, mutualization, pooling, competition, anti-selection, non-life, life, reinsurance</i>

Module 2: Flow and regulation

Lecture	Video Name
Lecture 1	Introduction to module
Lecture 2	Eco-system of a non-life product (premiums, combined/loss ratio, underwriting, renewals, claims handling, fraud, etc.)
Lecture 3	Eco-system of a life product (long term projection, parallel with a banking/financial product)
Lecture 4	Type of provisions
Lecture 5	ALM process
Lecture 6	Regulation (SII, IFRS17 and LGAAP)
Lecture 7	Wrap up
Key Terms	<i>Premiums, underwriting, claims handling, renewal, fraud, combined ratio, loss ratio, long-term risk projection, financial product, provisions, ALM, SII, IFRS17, LGAAP</i>

Module 3: The Role of Data Science in Insurance

Lecture	Video Name
Lecture 1	Introduction to module
Lecture 2	Potential business impact: business KPIs
Lecture 3	How can data be used and how can impact be estimated?
Lecture 4	List of potential use cases
Lecture 6	Wrap up
Key Terms	<i>Impact on FTE, impact on GWP, impact on costs reduction, impact on growth, impact on loss ratio, impact on combined ratio, radical simplification</i>

Module 4: Use cases

Lecture	Video Name
Lecture 1	Introduction to module
Lecture 2	Use case 1: portfolio optimization
Lecture 3	Use case 2: non-life pricing for a car insurance
Lecture 4	Wrap up
Key Terms	<i>Use case, portfolio optimization, non-life pricing, car insurance, machine learning (linear and non-linear methods)</i>