FRM P-2

Syllabus

2025

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-Aswini Bajaj

CA, CS, CFA, FRM, CAIA, CIPM, CFP, RV, CCRA, CIIB, CIRA, AIM

SYLLABUS

Subjects

Reading No.	Subject	Chapters	LOS		Weightage	No. of Questions
			Average	Total		
1	Market Risk	19	5	96	20%	16
2	Credit Risk	23	9	198	20%	16
3	Operational Risk	24	4	99	20%	16
4	Liquidity Risk	19	4	76	15%	12
5	Investment Risk	11	7	79	15%	12
6	Current Issues	18	2	44	10%	8
	TOTAL	**114**	**31**	**592**	**100%**	**80**

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Chapters

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	37	Future Value and Exposure	9
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	43	Risk Governance	4
	44	Risk Identification	4
	45	Risk Measurement and Assessment	7
	46	Risk Mitigation	7
	47	Risk Reporting	4
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	62	Capital Regulation Before the Global Financial Crisis	8
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Subject	Reading No 2025	Reading Name	No. of LOS
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	90	VaR and Risk Budgeting in Investment Management	8
	91	Risk Monitoring and Performance Measurement	10
	92	Portfolio Performance Evaluation	9
	93	Hedge Funds	8
	94	Performing Due Diligence on Specific Managers and Funds	7
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Learning Outcome

Reading No.	Reading Name	LOS	Learning Outcome
			Market Risk
1	Estimating Market Risk Measures-An Introduction and Overview	a	Estimate VaR using a historical simulation approach
		b	Estimate VaR using a parametric approach for both normal and lognormal return distributions
		c	Estimate the expected shortfall given profit and loss (P&L) or return data
		d	Estimate risk measures by estimating quantiles
		e	Evaluate estimators of risk measures by estimating their standard errors
		f	Interpret quantile-quantile (QQ) plots to identify the characteristics of a distribution
2	Non-Parametric Approaches	a	Apply the bootstrap historical simulation approach to estimate coherent risk measures
		b	Describe historical simulation using non-parametric density estimation
		c	Compare and contrast the age-weighted, the volatility-weighted, the correlation-weighted, and the filtered historical simulation approaches
		d	Identify advantages and disadvantages of non-parametric estimation methods
3	Parametric Approaches II-Extreme Value	a	Explain the importance and challenges of extreme values in risk management
		b	Describe extreme value theory (EVT) and its use in risk management
		c	Describe the peaks-over-threshold (POT) approach
		d	Compare and contrast the generalized extreme value (GEV) and POT approaches to estimating extreme risks
		e	Discuss the application of the generalized Pareto (GP) distribution in the POT approach
		f	Explain the multivariate EVT for risk management
4	Backtesting VaR	a	Describe backtesting and exceptions and explain the importance of backtesting VaR models
		b	Explain the significant difficulties in backtesting a VaR model
		c	Evaluate the accuracy of a VaR model based on exceptions or failure rates by using a model verification test
		d	Identify and describe Type I and Type II errors in the context of a backtesting process
		e	Explain the need to consider conditional coverage in the backtesting framework
		f	Describe the Basel rules for backtesting
5	VaR Mapping	a	Explain the principles underlying VaR mapping and describe the mapping process
		b	Explain how the mapping process captures general and specific risks, and calculate these risks in a portfolio given a set of primitive risk factors
		c	Differentiate among the three methods for mapping portfolios of fixed-income securities
		d	Summarize how to map a fixed-income portfolio into positions of standard instruments
		e	Describe how mapping of risk factors can support stress testing
		f	Explain how VaR can be calculated and used relative to a performance benchmark
		g	Describe the method of mapping forwards, forward rate agreements, interest rate swaps, and options
6	Validation of Risk Management Models for Financial Institutions	a	Describe some important considerations for a bank in assessing the conceptual soundness of a VaR model during the validation process
		b	Explain how to conduct sensitivity analysis for a VaR model, and describe the potential benefits and challenges of performing such an analysis
		c	Describe the challenges a financial institution could face when calculating confidence intervals for VaR
		d	Discuss the challenges in benchmarking VaR models and various approaches proposed to overcome them
7	Beyond Exceedance-Based Backtesting of Value-at-Risk Models	a	Identify the properties of an exceedance-based backtest that indicate a VaR model is accurate, and describe how these properties are reflected in a PIT-based backtest
		b	Explain how to derive probability integral transforms (PITs) in the context of validating a VaR model
		c	Describe how the shape of the distribution of PITs can be used as an indicator of the quality of a VaR model
		d	Describe backtesting using PITs, and compare the various goodness-of-fit tests that can be used to evaluate the distribution of PITs: the Kolmogorov-Smirnov test, the Anderson-Darling test, and the Cramér-von Mises test

Reading No.	Reading Name	LOS	Learning Outcome
8	Correlation Basics- Definitions, Applications, and Terminology	a	Describe financial correlation risk and the areas in which it appears in finance
		b	Explain how correlation contributed to the global financial crisis of 2007-2009
		c	Describe how correlation impacts the price of quanto options as well as other multi-asset exotic options
		d	Describe the structure, uses, and payoffs of a correlation swap
		e	Estimate the impact of different correlations between assets in the trading book on the VaR capital charge
		f	Explain the role of correlation risk in market risk and credit risk
		g	Explain how correlation risk relates to systemic and concentration risk
9	Empirical Properties of Correlation-How Do Correlations Behave in the Real World	a	Describe how equity correlations and correlation volatilities behave throughout various economic states
		b	Calculate a mean reversion rate using standard regression and calculate the corresponding autocorrelation
		c	Identify the best-fit distribution for equity, bond, and default correlations
10	Financial Correlation Modeling- Bottom-Up Approaches	a	Explain the purpose of copula functions and how they are applied in finance
		b	Describe the Gaussian copula and explain how to use it to derive the joint probability of default of two assets
		c	Summarize the process of finding the default time of an asset correlated to all other assets in a portfolio using the Gaussian copula
11	Regression Hedging and Principal Component Analysis	a	Explain the drawbacks to using a DV01-neutral hedge for a bond position
		b	Describe a regression hedge and explain how it can improve a standard DV01-neutral hedge
		c	Calculate the regression hedge adjustment factor, beta
		d	Calculate the face value of an offsetting position needed to carry out a regression hedge
		e	Calculate the face value of multiple offsetting swap positions needed to carry out a two-variable regression hedge
		f	Compare and contrast level and change regressions
		g	Explain why and how a regression hedge differs from a hedge based on a reverse regression
		h	Describe principal component analysis and explain how it is applied to constructing a hedging portfolio
12	Arbitrage Pricing with Term Structure Models	a	Calculate the expected discounted value of a zero-coupon security using a binomial tree
		b	Construct and apply an arbitrage argument to price a call option on a zero-coupon security using replicating portfolios
		c	Define risk-neutral pricing and apply it to option pricing
		d	Explain the difference between true and risk-neutral probabilities and apply this difference to interest rate drift
		e	Explain how the principles of arbitrage pricing of derivatives on fixed-income securities can be extended over multiple periods
		f	Define option-adjusted spread (OAS) and apply it to security pricing
		g	Describe the rationale behind the use of recombining trees in option pricing
		h	Calculate the value of a constant-maturity Treasury swap, given an interest rate tree and the risk-neutral probabilities
		i	Evaluate the advantages and disadvantages of reducing the size of the time steps on the pricing of derivatives on fixed-income securities
		j	Evaluate the appropriateness of the Black-Scholes-Merton model when valuing derivatives on fixed-income securities
13	Expectations, Risk Premium, Convexity, and the Shape of the Term Structure	a	Explain the role of interest rate expectations in determining the shape of the term structure
		b	Apply a risk-neutral interest rate tree to assess the effect of volatility on the shape of the term structure
		c	Estimate the convexity effect using Jensen's inequality
		d	Identify the components into which the return on a bond can be decomposed, and calculate the expected return on a bond for a risk-averse investor
		d	Evaluate the impact of changes in maturity, yield, and volatility on the convexity of a security
		e	Calculate the price and return of a zero-coupon bond incorporating a risk premium

Reading No.	Reading Name	LOS	Learning Outcome
14	The Art of Term Structure Models-Drift	a	Construct and describe the effectiveness of a short-term interest rate tree assuming normally distributed rates, both with and without drift
		b	Calculate the short-term rate change and standard deviation of the rate change using a model with normally distributed rates and no drift
		c	Describe methods for addressing the possibility of negative short-term rates in term structure models
		d	Construct a short-term rate tree under the Ho-Lee Model with time-dependent drift
		e	Describe uses and benefits of the arbitrage-free models and assess the issue of fitting models to market prices
		f	Describe the process of constructing a simple and recombining tree for a short-term rate under the Vasicek Model with mean reversion
		g	Calculate the Vasicek Model rate change, standard deviation of the rate change, expected rate in T years, and half-life
		h	Describe the effectiveness of the Vasicek Model
15	The Art of Term Structure Models-Volatility and Distribution	a	Describe the short-term rate process under a model with time-dependent volatility
		b	Calculate the short-term rate change and determine the behavior of the standard deviation of the rate change using a model with time-dependent volatility
		c	Assess the efficacy of time-dependent volatility models
		d	Describe the short-term rate process under the Cox-Ingersoll-Ross (CIR) and lognormal models
		e	Calculate the short-term rate change and describe the basis point volatility using the CIR and lognormal models
		f	Describe lognormal models with deterministic drift and mean reversion
16	The Vasicek and Gauss Models	a	Describe the structure of the Gauss+ model and discuss the implications of this structure for the model's ability to replicate empirically observed interest rate dynamics
		b	Compare and contrast the dynamics, features, and applications of the Vasicek model and the Gauss+ model
		c	Calculate changes in the short-term, medium-term, and long-term interest rate factors under the Gauss+ model
		d	Explain how the parameters of the Gauss+ model can be estimated from empirical data
17	Volatility Smiles	a	Describe a volatility smile and volatility skew
		b	Explain the implications of put-call parity on the implied volatility of call and put options
		c	Compare the shape of the volatility smile (or skew) to the shape of the implied distribution of the underlying asset price and to the pricing of options on the underlying asset
		d	Describe characteristics of foreign exchange rate distributions and their implications on option prices and implied volatility
		e	Describe the volatility smile for equity options and foreign currency options and provide possible explanations for its shape
		f	Describe alternative ways of characterizing the volatility smile
		g	Describe volatility term structures and volatility surfaces and how they may be used to price options
		h	Explain the impact of the volatility smile on the calculation of an option's Greek letter risk measures
		i	Explain the impact of a single asset price jump on a volatility smile
18	Fundamental Review of the Trading Book	a	Describe the changes to the Basel framework for calculating market risk capital under the Fundamental Review of the Trading Book (FRTB) and the motivations for these changes
		b	Compare the various liquidity horizons proposed by the FRTB for different asset classes and explain how a bank can calculate its expected shortfall using the various horizons
		c	Explain the FRTB revisions to Basel regulations in the following areas: - Classification of positions in the trading book compared to the banking book - Backtesting, profit and loss attribution, credit risk, and securitizations
		Credit Risk	
19	Fundamentals of Credit Risk	a	Define credit risk and explain how it arises using examples
		b	Explain the differences between insolvency, default, and bankruptcy
		c	Identify and describe transactions that generate credit risk

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Reading No.	Reading Name	LOS	Learning Outcome
19	Fundamentals of Credit Risk	d	Describe the entities that are exposed to credit risk and explain circumstances under which exposure occurs
		e	Discuss the motivations for managing or taking on credit risk
20	Governance	a	Define risk management responsibilities in an organization and explain the three lines of defense framework for effective risk management and control
		b	Explain the processes that lead to risk taking including credit origination, credit risk assessment, and credit approval processes
		c	Discuss the following key principles underlying best practice for the governance system of credit risk: Guidelines, Skills, Limits, and Oversight
		d	Describe the most common parameters of a credit-sensitive transaction
		e	Describe the roles of the credit committee in an organization
21	Credit Risk Management	a	Describe key elements of an effective lending or financing policy
		b	Explain the importance and challenges of setting exposure and concentration limits
		c	Describe the scope and allocation processes of a bank's credit facility and explain bank-specific policies and actions to reduce credit risk
		d	Discuss factors that should be considered during the credit asset classification process
		e	Describe and explain loan loss provisions and loan loss reserves
		f	Identify and explain the components of expected loss and differentiate between expected loss and unexpected loss
		g	Explain the requirements for estimating expected loss under IFRS 9
		h	Describe a workout procedure for loss assets and compare the following two approaches used to manage loss assets: retaining loss assets and writing off loss assets
		i	Explain the components of credit risk analysis
		j	Explain the components of credit risk management capacity, and identify key questions that the board of directors of a bank should ask
22	Capital Structure in Banks	a	Evaluate a bank's economic capital relative to its level of credit risk
		b	Identify and describe important factors used to calculate economic capital for credit risk: probability of default, exposure, and loss rate
		c	Define and calculate expected loss (EL)
		d	Define and calculate unexpected loss (UL)
		e	Estimate the variance of default probability assuming a binomial distribution
		f	Calculate UL for a credit asset portfolio and the UL contribution of each asset under various scenarios of portfolio composition, asset characteristics and size
		g	Describe how economic capital is derived
		h	Explain how the credit loss distribution is modeled
		i	Describe challenges to quantifying credit risk
23	Introduction to Credit Risk Modeling and Assessment	a	Explain the capital adequacy, asset quality, management, earnings, and liquidity (CAMEL) system used for evaluating the financial condition of a bank
		b	Describe quantitative measurements and factors of credit risk, including probability of default, loss given default, exposure at default, expected loss, and time horizon
		c	Estimate risk-weighted assets and capital adequacy ratio of a financial institution
		d	Describe the judgmental approaches, empirical models, and financial models to predict default
		e	Apply the Merton model to calculate default probability and the distance to default and describe the limitations of using the Merton model
		f	Compare and contrast different approaches to credit risk modeling, such as those related to the Merton model, Credit Risk Plus (CreditRisk+), CreditMetrics, and the Moody's-KMV model
		g	Apply risk-adjusted return on capital (RAROC) to measure the performance of a loan
24	Credit Scoring and Rating	a	Compare the credit scoring system to the credit rating system in assessing credit quality and describe the different types of each system
		b	Differentiate between through-the-cycle credit rating system and point-in-time credit rating system
		c	Describe the process for developing credit risk scoring and rating models
		d	Describe rating agencies' assignment methodologies for issue and issuer ratings, and identify the main criticisms of the credit rating agencies' ratings

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Reading No.	Reading Name	LOS	Learning Outcome
25	Credit Scoring and Retail Credit Risk Management	a	Analyze the credit risks and other risks generated by retail banking
		b	Explain the differences between retail credit risk and corporate credit risk
		c	Discuss the "dark side" of retail credit risk and the measures that attempt to address the problem
		d	Define and describe credit risk scoring model types, key variables, and applications
		e	Discuss the key variables in a mortgage credit assessment and describe the use of cutoff scores, default rates, and loss rates in a credit scoring model
		f	Discuss the measurement and monitoring of a scorecard performance including the use of cumulative accuracy profile (CAP) and the accuracy ratio (AR) techniques
		g	Describe the customer relationship cycle and discuss the trade-off between creditworthiness and profitability
		h	Discuss the benefits of risk-based pricing of financial services
26	Country Risk- Determinants, Measures, and Implications	a	Identify and explain the different sources of country risk
		b	Evaluate the methods for measuring country risk and discuss the limitations of using those methods
		c	Compare and contrast foreign currency defaults and local currency defaults
		d	Explain the consequences of a country's default
		e	Discuss measures of sovereign default risk and describe components of a sovereign rating
		f	Describe the shortcomings of the sovereign rating systems of rating agencies
		g	Compare the use of credit ratings, market-based credit default spreads, and CDS spreads in predicting default
27	Estimating Default Probabilities	a	Compare agencies' ratings to internal credit rating systems
		b	Describe linear discriminant analysis (LDA), define the Altman's Z-score and its usage, and apply LDA to classify a sample of firms by credit quality
		c	Describe the relationship between borrower rating and probability of default
		d	Describe a rating migration matrix and calculate the probability of default, cumulative probability of default, and marginal probability of default
		e	Define the hazard rate and use it to define probability functions for default time as well as to calculate conditional and unconditional default probabilities
		f	Describe recovery rates and their dependencies on default rates
		g	Define a credit default swap (CDS) and explain its mechanics including the obligations of both the default protection buyer and the default protection seller
		h	Describe CDS spreads and explain how CDS spreads can be used to estimate hazard rates
		i	Define and explain CDS-bond basis
		j	Compare default probabilities calculated from historical data with those calculated from credit yield spreads
		k	Describe the difference between real-world and risk-neutral default probabilities and determine which one to use in the analysis of credit risk
		l	Calculate the value of a firm's debt and equity, the volatility of firm value, and the volatility of firm equity using the Merton model
		m	Calculate distance to default and default probability using the Merton model
		n	Assess the quality of the default probabilities produced by the Merton model, the Moody's KMV model, and the Kamakura model
28	Credit Value at Risk	a	Compare market risk value at risk (VaR) with credit VaR in terms of definition, time horizon, and tools for measuring them
		b	Define and calculate Credit VaR
		c	Describe the use of rating transition matrices for calculating credit VaR
		d	Describe the application of the Vasicek's model to estimate capital requirements under the Basel II internal-ratings-based (IRB) approach
		e	Explain the Vasicek's model, Credit Risk Plus (CreditRisk+) model, and the CreditMetrics ways of estimating the probability distribution of losses arising from defaults as well as modeling the default correlation
		f	Define credit spread risk and assess its impact on calculating credit VaR
29	Portfolio Credit Risk	a	Define and calculate default correlation for credit portfolios
		b	Identify drawbacks in using the correlation-based credit portfolio framework

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Reading No.	Reading Name	LOS	Learning Outcome
29	Portfolio Credit Risk	c	Assess the impact of correlation on a credit portfolio and its Credit VaR
		d	Describe the use of a single factor model to measure portfolio credit risk, including the impact of correlation
		e	Define beta and calculate the asset return correlation of any pair of firms using the single factor model
		f	Estimate the probability of a joint default of any pair of credits and the default correlation between any pair of credits using the single factor model
		g	Describe how Credit VaR can be calculated using a simulation of joint defaults
		h	Assess the effect of granularity on Credit VaR
30	Credit Risk	a	Assess the credit risks of derivatives
		b	Define credit valuation adjustment (CVA) and debt valuation adjustment (DVA)
		c	Calculate the probability of default using credit spreads
		d	Describe, compare, and contrast various credit risk mitigants and their role in credit analysis
		e	Describe the significance of estimating default correlation for credit portfolios and distinguish between reduced form and structural default correlation models
		f	Describe the Gaussian copula model for time to default and calculate the probability of default using the one-factor Gaussian copula model
		g	Describe how to estimate credit VaR using the Gaussian copula and the CreditMetrics approach
31	Credit Derivatives	a	Describe a credit derivative, credit default swap (CDS), total return swap, and collateralized debt obligation (CDO)
		b	Explain how to account for credit risk exposure in valuing a CDS
		c	Identify the default probabilities used to value a CDS
		d	Evaluate the use of credit indices and fixed coupons in pricing CDS transactions
		e	Define CDS forwards and CDS options
		f	Describe the process of valuing a synthetic CDO using the spread payments approach and the Gaussian copula model of time to default approach
		g	Define the two measures of implied correlation: compound (tranche) correlation and base correlation
		h	Discuss alternative approaches used to estimate default correlation
32	Derivatives	a	Define derivatives and explain how derivative transactions create counterparty credit risk
		b	Compare and contrast exchange-traded derivatives and over-the-counter (OTC) derivatives, and discuss the features of their markets
		c	Describe the process of clearing a derivative transaction
		d	Identify the participants and describe the use of collateralization in the derivatives market
		e	Define the International Swaps and Derivatives Association (ISDA) Master Agreement, the risk-mitigating features it provides, and the default events it covers
		f	Describe the features and use of credit derivatives and discuss potential risks they may create
		g	Describe central clearing of OTC derivatives and discuss the roles, mandate, advantages, and disadvantages of the central counterparty (CCP)
		h	Explain the margin requirements for both centrally-cleared and non-centrally-cleared derivatives
		i	Define special purpose vehicles (SPVs), derivatives product companies (DPCs), monolines, and credit derivatives product companies (CDPCs) and describe the limitations of using them as risk mitigating methods
		j	Describe the approaches used and the challenges faced in modeling derivatives risk
33	Counterparty Risk and Beyond	a	Describe counterparty risk and differentiate it from lending risk
		b	Describe transactions that carry counterparty risk and explain how counterparty risk can arise in each transaction
		c	Identify and describe institutions that take on significant counterparty risk
		d	Describe credit exposure, credit migration, recovery, mark-to-market, replacement cost, default probability, loss given default, and the recovery rate
		e	Describe credit value adjustment (CVA) and compare the use of CVA and credit limits in evaluating and mitigating counterparty risk
		f	Identify and describe the different ways institutions can quantify, manage, and mitigate counterparty risk
		g	Identify and explain the costs of an OTC derivative
		h	Explain the components of the X-Value Adjustment (xVA) term

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Reading No.	Reading Name	LOS	Learning Outcome
34	Netting, Close-out and Related Aspects	a	Explain the purpose of an International Swaps and Derivatives Association (ISDA) master agreement
		b	Summarize netting and close-out procedures (including multilateral netting), explain their advantages and disadvantages, and describe how they fit into the framework of the ISDA master agreement
		c	Describe the effectiveness of netting in reducing credit exposure under various scenarios
		d	Describe the mechanics of termination provisions and trade compressions and explain their advantages and disadvantages
		e	Provide examples of trade compression of derivative positions, calculate net notional exposure amount, and identify the party holding the net contract position in a trade compression
		f	Identify and describe termination events and discuss their potential effects on parties to a transaction
35	Margin Collateral and Settlement	a	Describe the rationale for collateral management
		b	Describe the terms of a collateral agreement and features of a credit support annex (CSA) within the ISDA Master Agreement including threshold, initial margin, minimum transfer amount and rounding, haircuts, credit quality, and credit support amount
		c	Calculate the credit support amount (margin) under various scenarios
		d	Describe the role of a valuation agent
		e	Describe the mechanics of collateral and the types of collateral that are typically used
		f	Explain the process for the reconciliation of collateral disputes
		g	Explain the features of a collateralization agreement
		h	Differentiate between a two-way and one-way CSA agreement and describe how collateral parameters can be linked to credit quality
		i	Explain aspects of collateral including funding, rehypothecation, and segregation
		j	Explain how market risk, operational risk, and liquidity risk (including funding liquidity risk) can arise through collateralization
		k	Describe the various regulatory capital requirements
36	Central Clearing	a	Define a central counterparty (CCP) and describe the mechanics of central clearing
		b	Explain the concept of novation under central clearing
		c	Define netting, multilateral offset, and compression and provide examples of each
		d	Describe the application and estimation of margin and default funds under central clearing
		e	Discuss the risks faced by a CCP and the ways it manages its exposures
		f	Provide examples of a loss waterfall
		g	Explain the different methods of absorbing losses and managing the default of one or more members of a CCP
		h	Compare bilateral and central clearing
		i	Compare initial margin and default fund requirements for clearing members in relation to loss coverage, cost of clearing, and moral hazard
		j	Describe the advantages and disadvantages of central clearing
37	Future Value and Exposure	a	Describe and calculate the following metrics for credit exposure: expected mark-to-market, expected exposure, potential future exposure, expected positive exposure and negative exposure, effective expected positive exposure, and maximum exposure
		b	Compare the characterization of credit exposure to VaR methods and describe additional considerations used in the determination of credit exposure
		c	Identify factors that affect the calculation of the credit exposure profile and summarize the impact of collateral on exposure
		d	Identify typical credit exposure profiles for various derivative contracts and combination profiles
		e	Explain how payment frequencies and exercise dates affect the exposure profile of various securities
		f	Explain the general impact of aggregation on exposure, and the impact of aggregation on exposure when there is correlation between transaction values
		g	Describe the differences between funding exposure and credit exposure
		h	Explain the impact of collateralization on exposure and assess the risk associated with the remargining period, threshold, and minimum transfer amount
		i	Assess the impact of collateral on counterparty risk and funding, with and without segregation or rehypothecation

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Reading No.	Reading Name	LOS	Learning Outcome
38	CVA	a	Explain the motivation for and the challenges of pricing counterparty risk
		b	Describe credit value adjustment (CVA)
		c	Calculate CVA and CVA as a spread with no wrong-way risk, netting, or collateralization
		d	Evaluate the impact of changes in the credit spread and recovery rate assumptions on CVA
		e	Describe debt value adjustment (DVA) and bilateral CVA (BCVA)
		f	Explain the differences between unilateral CVA (UCVA) and BCVA, and between unilateral DVA (UDVA) and BCVA
		g	Calculate DVA, BCVA, and BCVA as a spread
		h	Explain how netting can be incorporated into the CVA calculation
		i	Define and calculate incremental CVA and marginal CVA and explain how to convert CVA into a running spread
		j	Explain the impact of incorporating collateralization into the CVA calculation, including the impact of margin period of risk, thresholds, and initial margins
		k	Describe wrong-way risk and contrast it with right-way risk
		l	Identify examples of wrong-way risk and examples of right-way risk
		m	Discuss the impact of collateral on wrong-way risk
		n	Identify examples of wrong-way collateral
		o	Discuss the impact of wrong-way risk on central counterparties (CCPs)
		p	Describe the various wrong-way modeling methods including hazard rate approaches, structural approaches, parametric approaches, and jump approaches
		q	Explain the implications of central clearing on wrong-way risk
39	The Evolution of Stress Testing Counterparty Exposures	a	Differentiate among current exposure, peak exposure, expected exposure, and expected positive exposure
		b	Explain the treatment of counterparty credit risk (CCR) both as a credit risk and as a market risk and describe its implications for trading activities and risk management for a financial institution
		c	Describe a stress test that can be performed on a loan portfolio, and on a derivative portfolio
		d	Differentiate between stressed expected loss and stress loss of a credit portfolio, and calculate the stress loss on a loan portfolio and the stress loss on a derivative portfolio
		e	Describe a stress test that can be performed on CVA
		f	Calculate the stressed CVA and the stress loss on CVA
		g	Calculate the DVA and explain how stressing DVA enters into aggregating stress tests of CCR
		h	Describe the common pitfalls in stress testing CCR
40	Structured Credit Risk	a	Describe common types of structured products
		b	Describe tranching and the distribution of credit losses in a securitization
		c	Describe a waterfall structure in a securitization
		d	Identify the key participants in the securitization process and describe conflicts of interest that can arise in the process
		e	Calculate and evaluate one or two iterations of interim cashflows in a three-tiered securitization structure
		f	Describe the treatment of excess spread in a securitization structure and estimate the value of the overcollateralization account at the end of each year
		g	Explain the tests on the excess spread that a custodian must go through at the end of each year to determine the cash flow to the overcollateralization account and to the equity noteholders
		h	Describe a simulation approach to calculating credit losses for different tranches in a securitization
		i	Explain how the default probabilities and default correlations affect the credit risk in a securitization
		j	Explain how default sensitivities for tranches are measured
		k	Describe risk factors that impact structured products
		l	Define implied correlation and describe how it can be measured
		m	Identify the motivations for using structured credit products
41	An Introduction to Securitisation	a	Define securitization, describe the securitization process, and explain the role of participants in the process
		b	Explain the terms over-collateralization, first-loss piece, equity piece, and cash waterfall within the securitization process

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Reading No.	Reading Name	LOS	Learning Outcome
41	An Introduction to Securitisation	c	Analyze the differences in the mechanics of issuing securitized products using a trust versus a special purpose vehicle (SPV) and distinguish between the three main SPV structures: amortizing, revolving, and master trust
		d	Explain the reasons for and the benefits of undertaking securitization
		e	Describe and assess the various types of credit enhancements
		f	Explain the various performance analysis tools for securitized structures and identify the asset classes they are most applicable to
		g	Define and calculate the delinquency ratio, default ratio, monthly payment rate (MPR), debt service coverage ratio (DSCR), the weighted average coupon (WAC), the weighted average maturity (WAM), and the weighted average life (WAL) for relevant securitized structures
		h	Explain the prepayment forecasting methodologies and calculate the constant prepayment rate (CPR) and the Public Securities Association (PSA) rate
Operational Risk			
42	Introduction to Operational Risk and Resilience	a	Describe an operational risk management framework and assess the types of risks that can fall within the scope of such a framework
		b	Describe the seven Basel II event risk categories and identify examples of operational risk events in each category
		c	Explain characteristics of operational risk exposures and operational loss events, and challenges that can arise in managing operational risk due to these characteristics
		d	Describe operational resilience, identify the elements of an operational resilience framework, and summarize regulatory expectations for operational resilience
43	Risk Governance	a	Explain the Basel regulatory expectations for the governance of an operational risk management framework
		b	Describe and compare the roles of different committees and the board of directors in operational risk governance
		c	Describe the "three lines of defense" model for operational risk governance and compare roles and responsibilities for each line of defense
		d	Explain best practices and regulatory expectations for the development of a risk appetite for operational risk and for a strong risk culture
44	Risk Identification	a	Discuss different top-down and bottom-up approaches and tools for identifying operational risks
		b	Describe best practices in extreme risk identification for operational risk
		c	Describe and apply an operational risk taxonomy and give examples of different taxonomies of operational risks
		d	Describe and apply the Level 1, 2, and 3 categories in the Basel operational risk taxonomy
45	Risk Measurement and Assessment	a	Explain best practices for the collection of operational loss data and reporting of operational loss incidents, including regulatory expectations
		b	Explain operational risk-assessment processes and tools, including risk control self-assessments (RCSAs), likelihood assessment scales, and heatmaps
		c	Describe the differences among key risk indicators (KRIs), key performance indicators (KPIs), and key control indicators (KCIs)
		d	Describe the use of factor-based models that quantitatively assess operational risk, and explain the application of the Swiss cheese model and the bowtie tool
		e	Estimate operational risk exposures based on the fault tree model given probability assumptions
		f	Describe approaches used to determine the level of operational risk capital for economic capital purposes, including their application and limitations
		g	Describe and explain the steps to ensure a strong level of operational resilience, and to test the operational resilience of important business services
46	Risk Mitigation	a	Explain and compare different ways firms address their operational risk exposures
		b	Compare different types of internal controls and provide examples of each type of internal control
		c	Describe control automation, internal control design, and control testing, including risks and challenges that arise in these processes and ways to make them more effective
		d	Describe methods to improve the quality of an operational process and reduce the potential for human error
		e	Explain how operational risk can arise with new products, new business initiatives, or mergers and acquisitions, and describe ways to mitigate these risks

Reading No.	Reading Name	LOS	Learning Outcome
46	Risk Mitigation	f	Identify and describe approaches firms should use to mitigate the impact of operational risk events
		g	Describe methods for the transfer of operational risks and the management of reputational risk, and assess their effectiveness in different situations
47	Risk Reporting	a	Identify roles and responsibilities of different organizational committees, and explain how risk reports should be developed for each committee or business function
		b	Describe components of operational risk reports and explain best practices in operational risk reporting
		c	Describe challenges to reporting operational risks, including characteristics of operational loss data, and explain ways to overcome these challenges
		d	Explain best practices for reporting risk exposures to regulators and external stakeholders
48	Integrated Risk Management	a	Describe the role of risk governance, risk appetite, and risk culture in the context of an enterprise risk management (ERM) framework
		b	Explain and differentiate between regulatory capital and economic capital requirements as prescribed in Basel regulations
		c	Describe the elements of a sound stress-testing framework for financial institutions and explain best practices for stress testing
		d	Explain challenges and considerations when developing and implementing models used in stress testing operational risk
49	Cyber-resilience-Range of practices	a	Define cyber-resilience and compare recent regulatory initiatives in the area of cyber-resilience
		b	Describe current practices by banks and supervisors in the governance of a cyber-risk management framework, including roles and responsibilities
		c	Explain methods for supervising cyber-resilience, testing and incident response approaches, and cybersecurity and resilience metrics
		d	Explain and assess current practices for the sharing of cybersecurity information between different types of institutions
		e	Describe practices for the governance of risks of interconnected third-party service providers
50	Case Study-Cyberthreats and Information Security Risks	a	Provide examples of cyber threats and information security risks, and describe frameworks and best practices for managing cyber risks
		b	Describe lessons learned from the Equifax case study
51	Sound Management of Risks related to Money Laundering and Financing of Terrorism	a	Explain best practices recommended by the Basel committee for the assessment, management, mitigation, and monitoring of money laundering and financing of terrorism (ML/FT) risks
		b	Describe recommended practices for the acceptance, verification, and identification of customers at a bank
		c	Explain practices for managing ML/FT risks in a group-wide and cross-border context
52	Case Study-Financial Crime and Fraud	a	Describe elements of a control framework to manage financial fraud risk and money laundering risk
		b	Summarize the regulatory findings and describe the lessons learned from the USAA case study
53	Guidance on Managing Outsourcing Risk	a	Explain how risks can arise through outsourcing activities to third-party service providers and describe elements of an effective program to manage outsourcing risk
		b	Explain how financial institutions should perform due diligence on third-party service providers
		c	Describe topics and provisions that should be addressed in a contract with a third-party service provider
54	Case Study-Third-Party Risk Management	a	Explain how risks related to the use of third parties can arise and describe characteristics of an effective third-party risk management framework
		b	Describe the lessons learned from the presented case studies

Reading No.	Reading Name	LOS	Learning Outcome
55	Case Study- Investor Protection and Compliance Risks in Investment Activities	a	Summarize important regulations designed to protect investors in financial instruments, including MiFiD, MiFiD II, and Dodd-Frank
		b	Describe lessons learned from the case studies involving violations of investor protection or compliance regulations
56	Supervisory Guidance on Model Risk Management	a	Describe model risk and explain how it can arise in the implementation of a model
		b	Describe elements of an effective model risk management process
		c	Explain best practices for the development and implementation of models
		d	Describe elements of a strong model validation process and challenges to an effective validation process
57	Case Study- Model Risk and Model Validation	a	Define a model and describe different ways that financial institutions can become exposed to model risk
		b	Describe the role of the model risk management function and explain best practices in the model risk management and validation processes
		c	Describe lessons learned from the three case studies involving model risk
58	Stress Testing Banks	a	Describe the evolution of the stress testing process and compare the methodologies of historical European Banking Association (EBA), Comprehensive Capital Analysis and Review (CCAR), and Supervisory Capital Assessment Program (SCAP) stress tests
		b	Explain challenges in designing stress test scenarios, including the problem of coherence in modeling risk factors
		c	Explain challenges in modeling a bank's revenues, losses, and its balance sheet over a stress test horizon period
59	Risk Capital Attribution and Risk-Adjusted Performance Measurement	a	Define, compare, and contrast risk capital, economic capital, and regulatory capital and explain methods and motivations for using economic capital approaches to allocate risk capital
		b	Describe the RAROC (risk-adjusted return on capital) methodology and its use in capital budgeting
		c	Calculate and interpret the RAROC for a project, loan, or loan portfolio and use RAROC to compare business unit performance
		d	Explain challenges that arise when using RAROC for performance measurement, including choosing a time horizon, measuring default probability, and choosing a confidence level
		e	Calculate the hurdle rate and apply this rate in making business decisions using RAROC
		f	Calculate the adjusted RAROC for a project to determine its viability
		g	Explain challenges in modeling diversification benefits, including aggregating a firm's risk capital and allocating economic capital to different business lines
		h	Explain best practices in implementing an approach that uses RAROC to allocate economic capital
60	Range of practices and issues in economic capital frameworks	a	Within the economic capital implementation framework, describe the challenges that appear in: - Defining and calculating risk measures - Risk aggregation - Validation of models - Dependency modeling in credit risk - Evaluating counterparty credit risk - Assessing interest rate risk in the banking book
		b	Describe the recommendations by the Bank for International Settlements (BIS) that supervisors should consider to make effective use of internal risk measures, such as economic capital, that are not designed for regulatory purposes
		c	Explain benefits and impacts of using an economic capital framework within the following areas: - Credit portfolio management - Risk-based pricing - Customer profitability analysis - Management incentives
		d	Describe best practices and assess key concerns for the governance of an economic capital framework

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Reading No.	Reading Name	LOS	Learning Outcome
61	Capital Planning at Large Bank Holding Companie-Supervisory Expectations and Range of Current Practice	a	Describe the Federal Reserve's Capital Plan Rule and explain the seven principles of an effective capital adequacy process for bank holding companies (BHCs) subject to the Capital Plan Rule
		b	Describe practices that can result in a strong and effective capital adequacy process for a BHC in the following areas: - Risk identification - Internal controls, including model review and validation - Corporate governance - Capital policy, including setting of goals and targets and contingency planning - Stress testing and stress scenario design - Estimating losses, revenues, and expenses, including quantitative and qualitative methodologies - Assessing the impact of capital adequacy, including risk-weighted asset (RWA) and balance sheet projections
62	Capital Regulation Before the Global Financial Crisis	a	Explain the motivations for introducing the Basel regulations, including key risk exposures addressed, and explain the reasons for revisions to Basel regulations over time
		b	Explain the calculation of risk-weighted assets and the capital requirement per the original Basel I guidelines
		c	Describe measures introduced in the 1995 and 1996 amendments, including guidelines for netting of credit exposures and methods for calculating market risk capital for assets in the trading book
		d	Describe changes to the Basel regulations made as part of Basel II, including the three pillars
		e	Compare the standardized internal ratings-based (IRB) approach, the foundation IRB approach, and the advanced IRB approach for the calculation of credit risk capital under Basel II
		f	Calculate credit risk capital under Basel II utilizing the IRB approach
		g	Compare the basic indicator approach, the standardized approach, and the advanced measurement approach for the calculation of operational risk capital under Basel II
		h	Summarize elements of the Solvency II capital framework for insurance companies
63	Solvency, Liquidity, and Other Regulation After the Global Financial Crisis	a	Describe and calculate the stressed VaR introduced in Basel 25 and calculate the market risk capital charge
		b	Explain the process of calculating the incremental risk capital charge for positions held in a bank's trading book
		c	Describe the comprehensive risk (CR) capital charge for portfolios of positions that are sensitive to correlations between default risks
		d	Define in the context of Basel III and calculate where appropriate: - Tier 1 capital and its components - Tier 2 capital and its components - Required Tier 1 equity capital, total Tier 1 capital, and total capital
		e	Describe the motivations for and calculate the capital conservation buffer and the countercyclical buffer, including special rules for globally systemically important banks (G-SIBs)
		f	Describe and calculate ratios intended to improve the management of liquidity risk, including the required leverage ratio, the liquidity coverage ratio, and the net stable funding ratio
		g	Describe the mechanics of contingent convertible bonds (CoCos) and explain the motivations for banks to issue them
		h	Provide examples of legislative and regulatory reforms that were introduced after the 2007-2009 financial crisis
64	High-level summary of Basel III reforms	a	Explain the motivations for revising the Basel III framework and the goals and impacts of the December 2017 reforms to the Basel III framework
		b	Summarize the December 2017 revisions to the Basel III framework in the following areas: - The standardized approach to credit risk - The internal ratings-based (IRB) approaches for credit risk - The CVA risk framework - The operational risk framework - The leverage ratio framework
		c	Describe the revised output floor introduced as part of the Basel III reforms and approaches to be used when calculating the output floor

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Reading No.	Reading Name	LOS	Learning Outcome
65	Basel III-Finalising post-crisis reforms	a	Explain the elements of the new standardized approach to measure operational risk capital, including the business indicator, internal loss multiplier, and loss component, and calculate the operational risk capital requirement for a bank using this approach
		b	Compare the Standardized Measurement Approach (SMA) to earlier methods of calculating operational risk capital, including the Advanced Measurement Approaches (AMA)
		c	Describe general and specific criteria recommended by the Basel Committee for the identification, collection, and treatment of operational loss data
Liquidity Risk			
66	Liquidity Risk	a	Explain and calculate liquidity trading risk via cost of liquidation and liquidity-adjusted VaR (LVaR)
		b	Identify examples of liquidity funding risk, funding sources, and lessons learned from real cases: Northern Rock, Ashanti Goldfields, and Metallgesellschaft
		c	Evaluate Basel III liquidity risk ratios and BIS principles for sound liquidity risk management
		d	Explain liquidity black holes and identify the causes of positive feedback trading
67	Liquidity and Leverage	a	Differentiate between sources of liquidity risk and describe specific challenges faced by different types of financial institutions in managing liquidity risk
		b	Summarize the asset-liability management process at a fractional reserve bank, including the process of liquidity transformation
		c	Compare transactions used in the collateral market and explain risks that can arise through collateral market transactions
		d	Describe the relationship between leverage and a firm's return profile (including the leverage effect), and explain the impact of different types of transactions on a firm's leverage and balance sheet
		e	Describe and compare methods to measure and manage funding liquidity risk and transactions liquidity risk
		f	Calculate the expected transactions cost and the spread risk factor for a transaction and calculate the liquidity adjustment to VaR for a position to be liquidated over a number of trading days
		g	Discuss interactions between different types of liquidity risk and explain how liquidity risk events can increase systemic risk
68	Early Warning Indicators	a	Evaluate the characteristics of sound Early Warning Indicators (EWI) measures
		b	Identify EWI guidelines from banking regulators and supervisors (OCC, BCBS, Federal Reserve)
		c	Discuss the applications of EWIs in the context of the liquidity risk management process
69	The Investment Function in Financial-Services Management	a	Compare various money market and capital market instruments and discuss their advantages and disadvantages
		b	Identify and discuss various factors that affect the choice of investment securities by a bank
		c	Apply investment maturity strategies and maturity management tools based on the yield curve and duration
70	Liquidity and Reserves Management-Strategies and Policies	a	Calculate a bank's net liquidity position and explain factors that affect the supply and demand of liquidity at a bank
		b	Compare strategies that a bank can use to meet demands for additional liquidity
		c	Estimate a bank's liquidity needs through three methods (sources and uses of funds, structure of funds, and liquidity indicators)
71	Intraday Liquidity Risk Management	a	Identify and explain the uses and sources of intraday liquidity
		b	Discuss the governance structure of intraday liquidity risk management
		c	Differentiate between methods for tracking intraday flows and monitoring risk levels
72	Monitoring Liquidity	a	Differentiate between deterministic and stochastic cash flows and provide examples of each
		b	Describe and identify examples of liquidity options and explain the impact of liquidity options on a bank's liquidity position and its liquidity management process
		c	Describe and apply the concepts of liquidity risk, funding cost risk, liquidity generation capacity, expected liquidity, and cash flow at risk
		d	Interpret the term structure of expected cash flows and cumulative cash flows
		e	Discuss the impact of available asset transactions on cash flows and liquidity generation capacity

Reading No.	Reading Name	LOS	Learning Outcome
73	The Failure Mechanics of Dealer Banks	a	Compare and contrast the major lines of business in which dealer banks operate and the risk factors they face in each line of business
		b	Identify situations that can cause a liquidity crisis at a dealer bank and explain responses that can mitigate these risks
		c	Assess policy measures that can alleviate firm-specific and systemic risks related to large dealer banks
74	Liquidity Stress Testing	a	Differentiate between various types of liquidity, including funding, operational, strategic, contingent, and restricted liquidity
		b	Estimate contingent liquidity via the liquid asset buffer
		c	Discuss liquidity stress test design issues such as scope, scenario development, assumptions, outputs, governance, and integration with other risk models
75	Liquidity Risk Reporting and Stress Testing	a	Describe best practices for the reporting of a bank's liquidity position
		b	Compare and interpret different types of liquidity risk reports
		c	Explain the process of reporting a liquidity stress test and interpret a liquidity stress test report
76	Contingency Funding Planning	a	Discuss the relationship between contingency funding planning and liquidity stress testing
		b	Describe best practices in the design of a sound contingency funding plan
		c	Assess the key components of a contingency funding plan (governance and oversight, scenarios and liquidity gap analysis, contingent actions, monitoring and escalation, and data and reporting)
77	Managing and Pricing Deposit Services	a	Differentiate between the various transaction and non-transaction deposit types
		b	Compare the different methods used to determine the pricing of deposits and calculate the price of a deposit account using cost-plus, marginal cost, and conditional pricing formulas
		c	Explain challenges faced by banks that offer deposit accounts, including deposit insurance, disclosures, overdraft protection, and basic (lifeline) banking
78	Managing Non-deposit Liabilities	a	Distinguish between the various sources of non-deposit liabilities at a bank
		b	Describe and calculate the available funds gap
		c	Discuss factors affecting the choice of non-deposit funding sources
		d	Calculate overall cost of funds using both the historical average cost approach and the pooled-funds approach
79	Repurchase Agreements and Financing	a	Describe the mechanics of repurchase agreements (repos) and calculate the settlement for a repo transaction
		b	Discuss common motivations for entering into repos, including their use in cash management and liquidity management
		c	Explain how counterparty risk and liquidity risk can arise through the use of repo transactions
		d	Assess the role of repo transactions in the collapses of Lehman Brothers and Bear Stearns during the 2007-2009 financial crisis
		e	Compare the use of general and special collateral in repo transactions
		f	Identify the characteristics of special spreads and explain the typical behavior of US Treasury special spreads over an auction cycle
		g	Calculate the financing advantage of a bond trading special when used in a repo transaction
80	Liquidity Transfer Pricing- A Guide to Better Practice	a	Discuss the process of liquidity transfer pricing (LTP) and identify best practices for the governance and implementation of an LTP process
		b	Discuss challenges that may arise for banks during the implementation of LTP
		c	Compare the various approaches to liquidity transfer pricing (zero cost, average cost, and matched-maturity marginal cost)
		d	Describe the contingent liquidity risk pricing process and calculate the cost of contingent liquidity risk
81	The US Dollar Shortage in Global Banking and the International Policy Response	a	Identify the causes of the US dollar shortage during the Great Financial Crisis
		b	Evaluate the importance of assessing maturity/currency mismatches across the balance sheets of consolidated entities
		c	Describe the policy response by international central banks to alleviate the US dollar shortage and assess its effectiveness

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Reading No.	Reading Name	LOS	Learning Outcome
82	Covered Interest Parity Lost- Understanding the Cross-Currency Basis	a	Differentiate between the mechanics of foreign exchange (FX) swaps and cross-currency swaps
		b	Identify key factors that affect the cross-currency swap basis
		c	Assess the causes of covered interest rate parity violations after the financial crisis of 2008
83	Risk Management for Changing Interest Rates- Asset-Liability Management and Duration Techniques	a	Discuss how asset-liability management strategies can help a bank hedge against interest rate risk
		b	Describe interest-sensitive gap management and apply this strategy to maximize a bank's net interest margin
		c	Describe duration gap management and apply this strategy to protect a bank's net worth
		d	Discuss the limitations of interest-sensitive gap management and duration gap management
84	Illiquid Assets	a	Evaluate the characteristics of illiquid markets
		b	Discuss the relationship between market imperfections and illiquidity
		c	Assess the impact of biases on reported returns for illiquid assets
		d	Explain the process of unsmoothing returns and the effects of unsmoothing
		e	Compare illiquidity risk premiums across and within asset categories
		f	Evaluate the impact of allocating illiquid assets to a portfolio, including the impact on rebalancing and trading and on optimizing the proportion of illiquid assets

Investment Risk

Reading No.	Reading Name	LOS	Learning Outcome
85	Factor Theory	a	Describe factors that impact asset prices and explain the theory of factor risk premiums
		b	Discuss the capital asset pricing model (CAPM) including its assumptions and explain how factor risk is addressed in the CAPM
		c	Explain the implications of using the CAPM to value assets, including equilibrium and optimal holdings, exposure to factor risk, its treatment of diversification benefits, and shortcomings of the CAPM
		d	Describe multifactor models and compare and contrast multifactor models to the CAPM
		e	Explain how stochastic discount factors are created and apply them in the valuation of assets
		f	Describe efficient market theory and explain how markets can be inefficient
86	Factors	a	Describe the process of value investing and explain why a value premium may exist
		b	Explain how different macroeconomic risk factors, including economic growth, inflation, and volatility, affect asset returns and risk premiums
		c	Assess methods of mitigating volatility risk in a portfolio and describe challenges that arise when managing volatility risk
		d	Explain how dynamic risk factors can be used in a multifactor model of asset returns, using the Fama-French model as an example
		e	Compare value and momentum investment strategies, including their return and risk profiles
87	Alpha and the Low-Risk Anomaly	a	Describe and evaluate the low-risk anomaly of asset returns
		b	Define and calculate alpha, tracking error, the information ratio, and the Sharpe ratio
		c	Explain the impact of benchmark choice on alpha and describe characteristics of an effective benchmark to measure alpha
		d	Describe Grinold's fundamental law of active management, including its assumptions and limitations, and calculate the maximum attainable information ratio using this law
		e	Apply a factor regression to construct a benchmark with multiple factors, measure a portfolio's sensitivity to those factors, and measure alpha against that benchmark
		f	Explain how to use style analysis to handle time-varying factor exposures
		g	Describe issues that arise when measuring alphas for nonlinear strategies
		h	Compare the volatility anomaly and the beta anomaly and analyze evidence of each anomaly
		i	Describe potential explanations for the risk anomaly

Reading No.	Reading Name	LOS	Learning Outcome
88	Portfolio Construction	a	Describe the inputs to the portfolio construction process and explain challenges faced when using these inputs
		b	Evaluate the motivation for and the methods used for refining alphas in the implementation process
		c	Describe neutralization and the different approaches used for refining alphas to be neutral
		d	Explain the implications of transaction costs on portfolio construction
		e	Describe practical issues in portfolio construction, including the determination of an appropriate risk aversion, aversions to specific risks, and proper alpha coverage
		f	Describe portfolio revisions and rebalancing, and analyze the tradeoffs between alpha, risk, transaction costs, and time horizon
		g	Determine the optimal no-trade region for rebalancing with transaction costs
		h	Evaluate the strengths and weaknesses of the following portfolio construction techniques: screens, stratification, linear programming, and quadratic programming
		i	Describe dispersion, explain its causes, and describe methods for controlling forms of dispersion
89	Portfolio Risk- Analytical Methods	a	Define, calculate, and compare the following portfolio VaR measures: diversified and undiversified portfolio VaR, individual VaR, incremental VaR, marginal VaR, and component VaR
		b	Explain the impact of correlation on portfolio risk
		c	Apply the concept of marginal VaR in making portfolio management decisions
		d	Explain and calculate the risk-minimizing position and position that maximizes the ratio of expected return to risk
		e	Explain the difference between risk management and portfolio management and describe how to use marginal VaR in portfolio management
90	VaR and Risk Budgeting in Investment Management	a	Define risk budgeting
		b	Describe the impact of horizon, turnover, and leverage on the risk management process in the investment management industry
		c	Describe the investment process of large investors such as pension funds
		d	Describe the risk management challenges associated with investments in hedge funds
		e	Describe and compare the following types of risk: absolute risk, relative risk, policy-mix risk, active management risk, funding risk, and sponsor risk
		f	Explain the use of VaR to monitor risk
		g	Explain how VaR can be used in the development of investment guidelines and for improving the investment process
		h	Describe the risk budgeting process and calculate risk budgets across asset classes and active managers
91	Risk Monitoring and Performance Measurement	a	Describe the three fundamental dimensions behind risk management, and their relation to VaR and tracking error
		b	Describe risk planning, including its objectives, effects, and the participants in its development
		c	Describe risk budgeting and the role of quantitative methods in risk budgeting
		d	Describe risk monitoring and its role in an internal control environment
		e	Identify sources of risk consciousness within an organization
		f	Describe the objectives and actions of a risk management unit in an investment management firm
		g	Explain how risk monitoring can confirm that investment activities are consistent with expectations
		h	Describe the Liquidity Duration Statistic and how it can be used to measure liquidity
		i	Describe the objectives of performance measurement tools
		j	Explain the use of alpha, benchmarks, and peer groups as inputs in performance measurement tools
92	Portfolio Performance Evaluation	a	Differentiate between the time-weighted and dollar-weighted returns of a portfolio and describe their appropriate uses
		b	Describe risk-adjusted performance measures, such as Sharpe's measure, Treynor's measure, Jensen's measure (Jensen's alpha), and the information ratio, and identify the circumstances under which the use of each measure is most relevant
		c	Describe the uses for the Modigliani-squared and Treynor's measure in comparing two portfolios and the graphical representation of these measures

Reading No.	Reading Name	LOS	Learning Outcome
92	Portfolio Performance Evaluation	d	Determine the statistical significance of a performance measure using standard error and the t-statistic
		e	Describe style analysis
		f	Explain the difficulties in measuring the performance of actively managed portfolios
		g	Describe performance manipulation and the problems associated with using conventional performance measures
		h	Describe techniques to measure the market timing ability of fund managers with a regression and with a call option model and calculate a manager's return due to market timing
		i	Describe and apply performance attribution procedures, including the asset allocation decision, sector and security selection decision, and the aggregate contribution
93	Hedge Funds	a	Explain biases that are commonly found in databases of hedge funds
		b	Explain the evolution of the hedge fund industry and describe landmark events that precipitated major changes in the development of the industry
		c	Explain the impact of institutional investors on the hedge fund industry and assess reasons for the growing concentration of assets under management (AUM) in the industry
		d	Explain the relationship between risk and alpha in hedge funds
		e	Compare and contrast the different hedge fund strategies, describe their return characteristics, and describe the inherent risks of each strategy
		f	Describe the historical portfolio construction and performance trends of hedge funds compared to those of equity indices
		g	Describe market events that resulted in a convergence of risk factors for different hedge fund strategies and explain the impact of such convergences on portfolio diversification strategies
		h	Describe the problem of risk sharing asymmetry between principals and agents in the hedge fund industry
94	Performing Due Diligence on Specific Managers and Funds	a	Identify reasons for the failures of hedge funds in the past
		b	Explain elements of the due diligence process used to assess investment managers
		c	Identify themes and questions investors can consider when evaluating a hedge fund manager
		d	Describe criteria that can be evaluated in assessing a hedge fund's risk management process
		e	Explain how due diligence can be performed on a hedge fund's operational environment
		f	Explain how a hedge fund's business model risk and its fraud risk can be assessed
		g	Describe elements that can be included as part of a due diligence questionnaire
95	Predicting Fraud by Investment Managers	a	Explain the use and efficacy of information disclosures made by investment advisors in predicting fraud
		b	Describe the barriers and the costs incurred in implementing fraud prediction methods
		c	Discuss ways to improve investors' ability to use disclosed data to predict fraud
Current Issues			
96	2023 Bank Failures, Preliminary lessons learnt for resolution	a	Evaluate the Credit Suisse case and its implications for the international resolution framework
		b	Evaluate the US bank failures of 2023 and their implications for the international resolution framework
		c	Identify and describe the strengths and weaknesses of the resolution framework as demonstrated by Credit Suisse case and the US bank failures of 2023
		d	Describe the uncovered issues for bank resolution that require further studies and development for future improvements on the implementation of the international resolution framework
97	Generative Artificial Intelligence in Finance-Risk Considerations	a	Compare generative AI and traditional AI/ML algorithms
		b	Explain the challenges generative AI systems pose for the financial sector, including those related to data privacy, embedded bias, model robustness, and explainability
		c	Examine the use of synthetic data to enhance AI models and the potential risks associated with synthetic data generation and application
		d	Evaluate the cybersecurity threats and potential impact on financial stability posed by the use of generative AI in the financial sector

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Reading No.	Reading Name	LOS	Learning Outcome
98	Artificial intelligence and the economy-implications for central banks	a	Identify and describe the risks arising from the widespread use of AI applications in the financial sector
		b	Describe how central banks can harness AI to fulfill their policy objectives
		c	Explain the macroeconomic impact of AI, including implications for firms' productive capacity and investment, labor productivity, household consumption, economic output, inflation, and fiscal sustainability
		d	Explain how the use of AI presents new opportunities and challenges for central banks, including the central banks' role as users and providers of data, and the trade-offs posed by their use of both internally-developed and external AI models
99	Interest Rate Risk Management by EME Banks	a	Describe the mechanisms through which changes in market interest rates affect a bank's economic value and the key methods banks use to manage interest rate risk
		b	Compare the methods banks in emerging market economies (EME) and banks in advanced economies have historically used to manage their interest rate risk and how these methods affected their vulnerability to changes in interest rates
		c	Explain the recent changes in EME banks' exposure to interest rate risk and the importance of hedging this risk
100	Laying a robust macro-financial foundation for the future	a	Explain why the sudden increase in inflation that reached a peak in 2022 following the Covid-19 pandemic did not result in a full-scale global recession
		b	Identify and describe key factors that played a role in the process of disinflation around the world over the past year
		c	Describe policy measures introduced and implemented by different central banks aimed at driving their economies toward meeting inflation targets
		d	Discuss how monetary policy changes enacted by central banks to reduce inflation impacted equity prices, credit spreads, bond and equity volatilities, and bank lending
		e	Describe monetary, fiscal, prudential, and structural policies that need to be adopted to promote (long-term) sustainable economic growth and low inflation
101	The Rise and Risks of Private Credit	a	Describe characteristics of private credit, including its typical investors and borrowers, and compare private credit to other types of loans and fixed-income instruments
		b	Explain the return profile and growth profile of the private credit asset class, and compare the historical returns of private credit to those of other asset classes
		c	Describe and assess the risks and vulnerabilities related to private credit, and explain how private credit can pose risks to financial stability
		d	Assess potential policy recommendations that could help mitigate the risks associated with private credit
102	Monetary and fiscal policy-safeguarding stability and trust	a	Compare and contrast the channels through which fiscal policy and monetary policy influence a country's economic activity and financial markets, and define the "region of stability" in terms of their joint policy stances
		b	Describe the consequences of breaching the boundaries of the region of stability, and how these consequences have evolved over time in advanced economies and in emerging market economies
		c	Describe the risks that global economies face as a result of high public debt levels, including the potential for these high debt levels, in combination with other factors, to drive tension between fiscal policy and monetary policy
103	Regulating the Crypto Ecosystem-The Case of Unbacked Crypto Assets	a	Define and describe crypto assets, including the categories broadly used by global financial regulators to classify them
		b	Evaluate the key components within the crypto ecosystem, the potential risks generated by these components, and potential regulatory responses to address those risks
		c	Identify and describe some of the global approaches to the regulation of unbacked crypto assets, including the BCBS' proposed treatment of banks' exposures to crypto assets
		d	Examine the considerations and steps introduced by the Bali Fintech Agenda (BFA) for developing a regulatory framework for crypto assets

Reading No.	Reading Name	LOS	Learning Outcome
104	Digital Resilience and Financial Stability	a	Describe characteristics of cyber risks and information/communication technology (ICT) risks faced by financial institutions
		b	Assess the interactions between cyber and ICT risks and financial risks and explain how cyber and ICT risk events at financial institutions can lead to systemic financial risk
		c	Describe potential macroprudential tools and policy measures that can be used to address cyber risks and ICT risks and explain challenges to the adoption of each one
		c	Describe current and developing methodologies for measuring climate-related financial risks employed by banks and supervisors
		e	Identify strengths and weaknesses of the main types of measurement approaches.
		f	Assess gaps and challenges in designing a modeling framework to capture climate-related financial risk