



# 3102004

## Derivatives and Risk Management

<b>Course Code</b>	3102004		<b>Course Name</b>	Derivatives and Risk Management	
<b>Instructor</b>	TBA		<b>Other Teachers</b>	TBA	
<b>Course delivery</b>	Lectures	Seminars	Guest Speakers	Group Activities	Field Trip(s)
	√	√			√
	Tutorials	Projects	Outreach Workshop	Presentations	Others
	√		Optional		√
<b>Total Hours</b>	54 in-class contact hours + Self Study Hours This course is worth 6 ECTS points.				

### Course Description

This course explores the methods for evaluating and managing the financial risk of companies and financial organisations. Particular emphasis is placed on fundamental pricing principles and the use of contemporary financial products in managing risk, including futures, forwards, options and swaps. Students will look at how organisations have implemented risk management practices in order to allow for calculated risks to be taken and to avoid overexposure to financial risks. For practical knowledge, students will look into the different types of derivative contracts and valuation techniques used in the industry today.

This course looks at existing policies and reflects on how these policies have been influenced by the substantial losses in financial markets from the past few decades, which have led to many companies forming risk management divisions of their own. By the end of the course, students will be equipped with problem-solving and analytical skills required to deal with financial risks. They will also have knowledge of relevant frameworks and tools required to effectively manage these financial risks.

## **Brief Schedule and Topics**

- Introduction to derivatives
- The importance of risk management and the approach to risk management
- Mechanics of Futures Markets
- Hedging Strategies Using Futures
- Determination of Forward and Futures Prices
- Interest Rate Futures
- Swaps
- Mechanics of Options Markets
- Properties of Stock Options
- Trading Strategies Involving Options
- Binomial Trees, Wiener Processes and Itô's Lemma and The Black-Scholes-Merton Model
- Options on Stock Indices and Currencies
- Options on Futures
- Greek Letters and Volatility Smiles
- Basic Numerical Procedures
- Risk Management and Value at Risk
- Exotic Options
- More on Models and Numerical Procedures
- Derivatives Mishaps and What We Can Learn from Them

## **Learning Objective**

At the end of this course, students should be able to:

- Identify the most common derivatives and apply the fundamental principles of derivatives pricing in different contexts;
- Identify the different financial products used to manage financial exposure and risk, including futures, forwards, options and swaps.
- Explain how derivative products can be tools used in hedging market risk, and appreciate the important role of derivatives in financial risk management.
- Understand the basic principles for the valuation of derivatives and the implications of these derivatives.
- Explain the significance of effective risk management strategies and the implications of failing to adopt these policies.
- Discuss the alternative risk management methods and when they may be applied by companies.
- Understand and evaluate the shortcomings of hedging as well as the general health of the financial markets;

- Form practical knowledge on how derivatives are employed in risk management through scenarios and case studies

## **Requirements**

This course is open to postgraduate students. Sound knowledge of topics covered in introductory Financial Studies units is a necessary basis for satisfactory completion of this course.

## **Reference Books**

Required textbook:

Futures, Options and Swaps, by R. W. Kolb, 4th Ed, Blackwell Publishing, 2003.

## **Assessments**

Assessments in this course include:

### **In class quizzes (3\* 10% each):**

Length: A 45 minutes quiz conducted in the class.

Task: This is a closed book examination.

Details of the test will be announced and discussed in class.

### **Individual Assignment (30%):**

Students will be completing an assignment relating to course topics. They are required to work individually to complete this task.

Details of the assignment will be announced and discussed during the class.

Late submission will attract a penalty of 10% of the total weighting of the assessment task.

Extensions will only be granted upon the basis that there is reasonable medical evidence of illness or any other extreme circumstances that the university may place under consideration. Under no circumstances will extensions be granted for work or any other commitments. A request for an extension must formally be submitted to the lecturer in writing prior to the due date, in accordance with the university assessment policies. Medical certificates or other evidence of extreme misfortune must be submitted through a special consideration form and must contain information that justifies the extension sought.

### **Final examination (40%):**

A final exam in the form of multiple choice, true/false questions and short answer questions. It will be conducted during the university's set examination period. To be completed at the set time.

## Detailed Daily Schedule (TBC)

Topic (tentative)	Description	Activities
<b>Introduction, Forwards and Futures</b>	Chapter 1. Introduction Chapter 2. Mechanics of Futures Markets Chapter 3. Hedging Strategies Using Futures	Lecture; class discussion ; Case studies
<b>Futures Prices; Swaps</b>	Determination of Forward and Futures Prices; Currency Swaps	Lecture; class discussion ; Case studies
<b>Stock Options; Trading Strategies Involving Options</b>	Properties of Stock Options; Trading Strategies Involving Options	Lecture; class discussion; Case studies; <b>In-class quiz 1</b>
<b>Options Pricing Models 1</b>	Binomial Trees; Wiener Processes and Itô's Lemma	Lecture; class discussion ; Case studies
<b>Options Pricing Models 2</b>	The Black-Scholes-Merton Model	Lecture; class discussion ; Case studies
<b>Properties of stock options</b>	Options on Stock Indices and Currencies; Options on Futures	Lecture; class discussion; <b>In-class quiz 2</b>
<b>The Greek Letters; Volatility Smiles ; Basic Numerical Procedures</b>	Greek Letters; Volatility Smiles ; Basic Numerical Procedures	Lecture; class discussion ; Case studies
<b>Risk Management; Value at Risk</b>	Risk Management; Value at Risk	Lecture; class discussion ; Case studies
<b>Exotic Options</b>	Exotic Options	Lecture; class discussion; <b>In class quiz 3</b>
<b>More on Models and Numerical Procedures ; Derivatives Mishaps</b>	Other Models and Numerical Procedures ; Derivatives Mishaps and What We Can Learn from Them	Lecture; class discussion; <b>Individual assignment submission</b>

Content is subject to change.

## Academic Integrity and Policies

[Tongji University Academic Policy](#) for international students makes reference to the Academic Policy for Undergraduates (Issuing on 20th, June 2005) and Academic Policy for Postgraduates.

### Academic Integrity

Students are expected to uphold the university's academic honesty principles, which are an integral part of the university's core values and principles. If a student fails to observe the acceptable standards of academic honesty, they could attract penalties and even disqualification from the course in more serious circumstances. Students are responsible for knowing and observing accepted principles of research, writing and any other task which they are required to complete.

Academic dishonesty or cheating includes acts of plagiarism, misrepresentation, fabrication, failure to reference materials used properly and forgery. These may include, but are not limited to: claiming the work of others as your own, deliberately applying false and inaccurate information, copying the work of others in part or whole, allowing others in the course to copy your work in part or whole, failing to appropriately acknowledge the work of other scholars/authors through acceptable referencing standards, purchasing papers or writing papers for other students and submitting the same paper twice for the same subject.

This Academic Integrity policy applies to all undergraduates of the Tongji University in all programmes of study, including non-graduating students. It is to reinforce the University's commitment to maintain integrity and honesty in all academic activities of the University community.

### Policy

- The foundation of good academic work is honesty. Maintaining academic integrity upholds the standards of the University.
- The responsibility for maintaining integrity in all the activities of the academic community lies with the students as well as the faculty and the University. Everyone in this community must work together to ensure that the values of truth, trust and justice are upheld.
- Academic dishonesty affects the University's reputation and devalues the degrees offered.
- The University will impose serious penalties on students who are found to have violated this Policy. The following penalties may be imposed:
  - Expulsion;
  - Suspension;
  - Zero mark/fail grade;
  - Marking down;
  - Re-doing/re-submitting of assignments or reports; and
  - Verbal or written warning.