Financial Information Systems (FIS)

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Overview

The aim of the Financial Information Systems (FIS) course is to present the Information Systems and their Technology that the Financial Industry (Banks, Investment Firms, Brokerage Houses, Exchanges) use, and how these IT systems operate and evolve.

Key Outcomes

By the end of the course, the students will be able to design and implement Financial Information Systems and manage their operation. They will also have the necessary background to pursue a research path in Data Mining and Algorithms for Financial records and operations, or manage IT Projects in various Divisions of Banks and Financial Institutions.

Requirements and Prerequisites

The prerequisites of the course are

(a) basic knowledge of Financial and Economic Science.
(b) good knowledge of SQL and Programming.

Books

The course is strongly influenced by the book “Business Knowledge for IT in Retail Banking: A Complete Handbook for IT Professionals”. Essvale Corporation (2007)

Software/Computing Requirements

The students will be allowed to implement the programming assignments of the course in any language, though C# or JAVA and T-SQL are recommended. No specialized hardware is required.

Grading

In each unit, study exercises are provided (solved and unsolved, some requiring programming), of which one or two per unit are handed in (as assignments). Students are graded for their participation in class (10%), assignments (45%), and their performance at the final exam (45%).

Participation

In-class contribution is a significant part of your grade and an important part of our shared learning experience. Your active participation helps us to evaluate your overall performance. You can excel in this area if you come to class on time and contribute to the course by:

- Providing strong evidence of having thought through the material.
- Advancing the discussion by contributing insightful comments and questions.
- Listening attentively in class.
- Demonstrating interest in your peers' comments, questions, and presentations.
- Giving constructive feedback to your peers when appropriate.

Please arrive to class on time and stay to the end of the class period. Chronically arriving late or leaving class early is unprofessional and disruptive to the entire class. Repeated tardiness will have an impact on your grade.

Turn off all electronic devices prior to the start of class. Cell phones, tablets, and other electronic devices are a distraction to everyone. If the course requires you to use a laptop or other device in class, you will be informed to do so.

Late Assignments

Late assignments will either not be accepted or will incur a grade penalty unless due to documented serious illness or family emergency. Exceptions to this policy for reasons of civic obligations will only be made available when the assignment cannot reasonably be completed prior to the due date, you make suitable arrangements, and give notice for late submission in advance.

Attendance Requirements

Class attendance is essential to succeed in this course and is part of your grade. An excused absence can only be granted in cases of serious illness or grave family emergencies and must be documented. Job interviews and incompatible travel plans are considered unexcused absences. Where possible, please notify the instructor in advance of an excused absence.

Students are responsible for keeping up with the course material, including lectures, from the first day of this class, forward. It is the student's obligation to bring oneself up to date on any missed coursework.

Code of Ethics

Students may not work together on individual graded assignments unless the instructor gives express permission.

Exercise integrity in all aspects of one's academic work including, but not limited to, the preparation and completion of all other course requirements by not engaging in any method or means that provides an unfair advantage. In any case of doubt, students must be able to prove that they are the sole authors of their work by demonstrating their knowledge to the instructor.

Clearly acknowledge the work and efforts of others when submitting written work as one's own. Ideas, data, direct quotations (which should be designated with quotation marks), paraphrasing, creative expression, or any other incorporation of the work of others should be fully referenced. No plagiarism of any sort will be tolerated. This includes any material found on the internet. Reuse of material found in question and answer forums, code repositories, other lecture sites, etc., is unacceptable. You may use online material to deepen your understanding of a concept, not for finding answers.

Course Syllabus

The course comprises six units of three hours each.

Unit 1: Introduction to Financial Institutions, Well known Systems and Protocols

- Divisions in Financial Institutions that use FIS; Backoffice, Middleoffice, Frontoffice, Compliance-Risk-Audit. Special mention to Exchanges and Brokerage Firms (high speed trading, and algorithmic routing of orders).
- Most well-known Systems and Protocols (Bloomberg, Reuters, Fidessa, Target, SWIFT, FIX etc).

Homework: introduction: Intro to one of the FIS. Download and Install a trial version. Prepare a small analysis on a (random) Equity based on the platform's data.

Units 2: Frontoffice systems

- Frontoffice: Online Messaging Systems and Protocols. Swift, FIX, ODL (Athens Exchange). Trading applications. OASIS (Athens Exchange), Fidessa, SaxoBank, Interactive Brokers, Bloomberg.

Homework: Implementation: Import FIX Messages to one SQL Database. Data mining for the orders that were received.

Unit 3: Compliance, Risk, Audit, AML, Information Security

- Compliance-Risk-Audit: Anti Money Laundry Applications, Risk Assessment Tools, Audit methodology, Market manipulation, Information Security.

Homework: Analysis: Analysis of an Anti Money Laundry system for Banking Transactions.

Unit 4: Backoffice Systems, Business Continuity

- Backoffice: Book keeping applications, CRMs, Reporting, Clearing Houses, Corporate actions.
- Business Continuity Plan.

Homework: Implementation: SQL creation of a Schema that supports Transaction Trade Confirmations and Slips for the Clients.

Unit 5: Algos, Optimization, Arbitrage, Automated Trading Systems

- Algorithmic Trading, High Frequency trading, Arbitrage, Automated Trading Systems.

Homework: Analysis: Create an Algorithm that will work an Iceberg order.

Unit 6: Overview

- Overview and preparation for the Examination.

Homework: No homework