

# ISE 441: Financial Engineering Project

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| <b>Faculty Advisor:</b> | Luis F. Zuluaga  | <b>Industry Sponsor:</b> | Dr. Wilson Yale   |
| <b>Office:</b>          | Mohler Lab #385  |                          |   |
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| <b>Office hours:</b>    | We 2:00-4:00 PM<br>or by appointment                                 | <b>Course web site:</b>  | <a href="https://coursesite.lehigh.edu/">https://coursesite.lehigh.edu/</a> |

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## 1 Course Description

Analysis, design and implementation of solutions to programs in financial services using information technology, mathematical modeling, and other financial engineering techniques. Emphasis on real-world problem solving, problem definition, implementation, and solution evaluation.

## 2 Course Learning Objectives

- To integrate tools in probability/statistics, optimization, simulation, and information technology, to design financial instruments, transactional systems, and technology-enabled solutions.
- To bridge the knowledge and skill gaps between financial professionals (e.g., asset managers) and computing/execution professionals (e.g., IT specialists).

## 3 Course Deliverables, Schedule, and Marking Scheme

Students should form groups of **THREE (3)** students to work on a project related to **ONE (1)** of the following topics:

- **Estimating Gamma: The value of financial planning retirement decisions**
- **Measuring Liquidity Risk**
- **Liquidity Risk and Portfolio Allocation**

A detailed description of these topics and guidance on the development of the project associated to each topic will be available in the CourseSite website of the course. The following are the deliverables associated with the projects together with the due date for these deliverables and their weight of the course's final mark.

| Deliverable                         | Due Date      | Submission            | Weight |
|-------------------------------------|---------------|-----------------------|--------|
| Group composition & topic selection | 09/10         | CourseSite            | 0%     |
| Literature Review                   | 10/01         | CourseSite            | 20%    |
| Preliminary Report                  | 10/29         | CourseSite            | 20%    |
| Preliminary Presentation (15min)    | 11/19 – 11/23 | Time and Location TBA | 20%    |
| Final Report                        | 12/10         | CourseSite            | 20%    |
| Final Presentation (25min)          | 12/10 – 12/14 | Time and Location TBA | 20%    |

Although no exact page limit will be set for any of the deliverables, your team should be looking for a final report that does not exceed a typical article length; that is, between 15-25 pages.

The course will not have a regular meeting time. However, your team is **ENCOURAGED** to meet **REGULARLY** with the faculty advisor to discuss your team's progress with the project and any related questions.

## 4 Certificates of Achievement

At most four (4) project teams (as judged by presentations and final reports) will be issued certificates of achievement: first place, second place, third place, and honorable mention. The faculty advisor and industry sponsor reserve the right to issue fewer than four (4) certificates depending on quality of deliverables.

### 4.1 Accommodations for Students with Disabilities

If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, University Center C212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.

### 4.2 The Principles of Our Equitable Community

Lehigh University endorses The Principles of Our Equitable Community (<http://www4.lehigh.edu/diversity/principles>). We expect each member of this class to acknowledge and practice these Principles. Respect for each other and for differing viewpoints is a vital component of the learning environment inside and outside the classroom.

### 4.3 Irresponsible Behavior

**Please take a look at the material about Academic Integrity available in the CourseSite website of the course.** There are many forms of irresponsible behavior that can ruin opportunities for you or for others in this course; there is no room and no excuse for bad behavior. Examples of irresponsible behavior cover a wide range, and include cheating, plagiarism, creating hazards or disruptions, slacking on responsibilities, unfairly exploiting the efforts of others, etc. Further explanation and guidelines on academic integrity at Lehigh can be found on the University Student Conduct System web page <http://www.lehigh.edu/~indost/conduct/handbook/sect6.shtml>, and on the Fostering Academic Integrity at Lehigh University web site <http://www.lehigh.edu/~infkli/AcademicIntegrity.htm>. It is highly recommended that you take a look at the information in the web site [http://www.lehigh.edu/lts/official/Academic\\_Integrity\\_Vignettes.pdf](http://www.lehigh.edu/lts/official/Academic_Integrity_Vignettes.pdf). It is firm policy in this course that cheating or plagiarism are unacceptable violations of academic integrity, and will earn an F as the semester grade in the course. Please meet requirements in good spirit, and do your part in advance of deadlines. For example, do not copy data or sections of Homework reports from students currently or previously enrolled. While students are encouraged to discuss Homework problems together, the final solution should be obtained independently, and the writing of the Homework report is an individual responsibility... do not ask for other student's work, and do not share yours with others. Various forms of carelessness or disregard for safety considerations, abuse of others, compromising opportunities for others, failing to participate in good faith, etc., can also have serious consequences. Appropriate penalties should be expected. Offenders may lose points from their course totals, and serious offenders may be dropped from the course.

**Note: this syllabus is subject to change.**