UNIVERSITY OF MARYLAND

ROBERT H. SMITH
SCHOOL OF BUSINESS

Department of Decision, Operations and Information Technologies
University of Maryland

BUDT 758I-0501
Financial Information Systems
Fall 2017

Instructors:	**Leonard Mills and Ravi Pandey**
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Class Meets:	Monday 07:00 PM – 09:45 PM VMH 1528
Office Hours:	TBD

Course Introduction

There has been an explosion in volume, velocity, and variety of financial data. Most of the financial institutions have automated their processes and digitized their solutions. This brought huge demand for professionals from a variety of professional fields who not only use cutting-edge technologies but also understand the financial terminology and concepts.

The course is designed for Master of Science in Information System (MSIS) students who are looking for a possible career in financial industry. The course assumes no background in finance. Also, the IT knowledge required for this course will be provided to all the students before starting the core financial concepts.

This course uses a practical approach to understanding the financial concepts using various open-source technologies such as R and Python. The focus of the course is to provide relevant background in financial industry and leverage student's IT background to position them for possible IT/IS opportunities in the financial industry.

Course Objectives:

The focus of the course is to provide relevant background in financial industry and leverage student's IT background to position them for possible IT/IS opportunities in financial industry.

Course Length:

This is a 3-credit full semester course, which will be taught in one evening class per week.

Learning Objectives

The course has two primary objectives:

1. Enable students to understand various basic concepts and terminology used in financial industry
2. Allow students to use technology like R and Python to implement those concepts.

After completing this course, students will be able to:

Handle, process and forecast time-series data

Understand and build machine learning models for handling credit risk

Understand and optimize portfolio using technologies such as R/Python

Able to perform financial trading using technologies such as R/Python

Though financial domain/industry is very extensive, an introductory course, such as this, is useful in providing much-needed familiarity with important concepts and teaching students to implement those concepts through practical example applications.

Course Methodology:

This course will focus on giving the theoretical foundations of topics covered in the syllabus along with their practical implementation. The course is split in 30:70 ratio of theory to practical. The course will be built upon various practices followed by several Fortune-500 companies. This course will also be accompanied by a major project where students will be practicing the concepts learned in the classes.

Prerequisites

There are no formal prerequisites from either the finance or IS domains. Any concepts in R/python and finance will be covered in the class.

Software Needed

We will use R and Python for this course. These are open-source technology and are easily available on the internet. Libraries used for this course are also free and easily downloadable. Most of the time we will download data from free and public sources such as Yahoo Finance and Google Finance.

Class Materials

- Analyzing Financial Data and Implementing Financial Models Using R - Clifford S. Ang
- Python for Finance (optional) - Yves Hilpisch
- Class Handouts

Assignments

We have 4 homework assignments designed to understand concepts and ideas that are discussed in the class, and apply in programming exercises. These assignments are mainly from the lectures.

Class project

We will form 9 different groups (a group of 5) and each student will be assigned to one of these. Each group will analyze some financial data and apply concepts taught in the class. Datasets will be provided by us. Group can come with their own dataset if they want to, but get instructor approval to use for the assignments. Further details of the projects will be provided in class.

Grading
Your final grade for the course will be composed of the following items:

Class participation	:	20%*1	= 20%
Class project	:	20%*1	= 20%
HW Assignment	:	10%*4	= 40%
Final	:	20%*1	= 20%

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Session	Topics	Readings	Assignment
8/28/2017	Collecting and Manipulating Time Series Data in R	Ang Chapter 1	
9/04/2017	Holiday : Labor Day		
9/11/2017	Return Calculation in R – Part 1	Ang, Chapter 2	
9/18/2017	Return Calculation in R – Part 2	Ang, Chapter 3	Homework -1
9/25/2017	Risk Calculation in R – Part 1	Ang, Chapter 4	
10/02/2017	Risk Calculation in R – Part 2	Ang, Chapter 5	
10/09/2017	Introduction to Risk-adjusted Portfolio Measures in R	Ang, Chapter 6	Homework -2
10/16/2017	Introduction to Portfolio Optimization in R	Ang, Chapter 7	
10/23/2017	Introduction to Fixed Income – Data Collection and Basic Analysis	Ang, Chapter 8	
10/30/2017	Introduction to Options Pricing Model - Data Collection and Basic Analysis	Ang, Chapter 9	Homework -3
11/06/2017	Simulation Techniques in Python – Part 1	Hilpisch, Chapters 10,16	
11/13/2017	Simulation Techniques in Python – Part 2	Hilpisch, Chapters 16,17	
11/20/2017	Distribution Fitting	Class Handouts	Homework -4
11/27/2017	Introduction to Mortgage Models- I	Class Handouts	
12/04/2017	Introduction to Mortgage Models - II	Class Handouts	
12/11/2017	Project Presentations		
12/18/2017	Final Exam		