GEORGETOWN UNIVERSITY McDonough SCHOOL of BUSINESS

# Computer-based Decision Support Systems (OPIM 557)

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| University: | Georgetown |
| School: | McDonough School of Business |
| Department: | Operations and Information Management (OPIM) |
| Course: | Computer-based Decision Support Systems (557) |
| Sections: | 40 - Mondays and Wednesdays from 3:30pm to 4:50pm in Hariri 370<br>41 - Monday nights from 6:30pm to 9:20pm in Hariri 230 |
| Credits: | 1.5 |
| Prerequisites: | N/A |

## Description

This course explores advanced topics in management support systems with a focus on decision theory. The course will present insights into key issues and problems in decision support information systems. The Visual Basic for Applications (VBA) programming language within MS Excel will be used as the primary tool to build basic decision support systems. Class deliverables will be systems built with VBA code.

## Learning Objectives

1. Discuss computer-based information systems and their role in businesses and society.
2. Create decision support systems in MS Excel using the VBA programming language and ActiveX Controls.
3. Network with business and technology professionals to gain insights into industry issues.
4. Gain marketable programming skills.
5. Have fun!

# Community

## Students

This course is a graduate business school (MBA) elective, with a maximum enrollment of 50 students per section.

## Professor

Michael Rossetti, a professional data scientist and software developer, will be teaching this course. Students should feel free to direct questions to the professor by sending a Slack direct message to @prof-rossetti or an email to mjr300@georgetown.edu. If emailing, all parties should use university-issued addresses. The professor aims to respond to messages within around one to three business days.

When sending announcements and replying to students, the professor may send messages outside of normal business hours. There is no expectation for students to keep the same schedule. Students should feel free to read and reply to messages at whatever time is most preferable for them!

# Materials

## Texts

Students are encouraged to reference the following online documentation and resources:

- VBA Language Reference (Microsoft.com)
- Excel VBA Reference (Microsoft.com)
- Learning VBA in Excel (Lynda.com)

For additional reference, the following books may prove helpful:

- Excel VBA Programming For Dummies, by John Walkenbach
- Microsoft Excel 2016 Power Programming with VBA, by Michael Alexander

## Computers

Each student should have access to a personal portable computer during class. The computer should allow use of MS Excel, as well as the Visual Basic for Applications (VBA) programming language and ActiveX Controls found inside of MS Excel. Students are highly encouraged to use a Windows computer because MS Excel for Mac may not include ActiveX Controls. Any student who doesn't have access to a suitable computer during class may inquire with the technology center about loaning a laptop or using virtualization software.

# Operations

## Canvas

All registered students should have access to the Canvas learning management platform. The course calendar in Canvas is the most up-to-date source of information about the scheduling of class sessions and deliverables. Students will be expected to submit deliverables through Canvas except when otherwise instructed, and the professor will distribute all grades through the Canvas gradebook.

## GitHub

GitHub is the leading online platform for sharing software and code-related resources. The course GitHub repository is the primary source of course materials, including programming language references, instructional exercises, and project descriptions. The course repository will also include a copy of all email announcements after they are sent.

## Slack

Slack is a chat platform that will be used to share code snippets, links to helpful materials, and other incidental course communications. All students should join the course Slack team at the beginning of the semester when invited by the professor. Students are encouraged to post questions and answers in section-specific discussion channels (#557-40 or #557-41), and to monitor section-specific mediasite channels (#mediasite-40 or #mediasite-41) for links to class recordings. Students may optionally join the #557-dev channel to subscribe to a news feed of updates to the course repository, or the #meetups channel to discuss upcoming events and opportunities for industry networking. The professor may create additional channels as applicable to serve assignment-specific purposes or facilitate group communications.

Reference: Emoji Cheat Sheet 😀

# Evaluation

Student learning will be evaluated primarily through three hands-on projects (60% total), as well as two hands-on programming assignments (15% total) and an industry insights assignment (10%). Students will also receive credit for on-time submission of an onboarding survey and six weekly progress check-in forms (15% total). Students should consult the schedule and the calendar for due dates and weights of all items due for evaluation. The professor aims to provide grades for all submitted items within around seven to ten days after the due date, and may utilize graduate assistants during the grading process. Any student who has a question or concern about a grade should ask the professor in writing within seven days of receiving the grade, and the professor will look into the matter in a timely manner.

## Assignments

### Excel Objects Assignment

The Excel Objects Assignment introduces students to programmatically accessible objects and events in MS Excel, and provides a guided introduction to VBA programming.

### ActiveX Controls Assignment

The ActiveX Controls Assignment introduces students to programmatically accessible user interface elements in MS Excel, and provides a guided experience to accompany the learning of new VBA programming concepts.

### Industry Insights Assignment

The Industry Insights Assignment encourages students to network with professionals in the data, programming, and technology industries to gain additional exposure to contemporary industry issues.

## Projects

### Retirement Savings Calculator

The Retirement Savings Calculator, a Decision-Support System, acts as a practical financial modeling tool. Students will create an interactive application which accepts a number of user inputs to predict how long someone's retirement savings will last under various scenarios.

### Executive Dashboard

The Executive Dashboard, a Management Information System, provides reporting capabilities to aid decision-making. Students will create a tool which automates the process of transforming monthly sales data into a summary report of business insights, including the aggregation of total sales and identification of top-selling products. The dashboard may utilize charts and graphs to help tell a compelling story.

### Stock Trading Recommendation System

The Stock Trading Recommendation System, a Decision-Support System, illustrates the real world possibilities and value of computer-based information systems. Students will create an interactive application which generates stock trading recommendations based on user risk preferences and real live historical stock market data from the Internet.

# Schedule

The schedule is tentative and may change to reflect actual pace of instruction. In the event of a schedule change, the professor will likely send an announcement.

| **Week of** | **Unit** | **Topic(s)** | **Due** (by the following Sunday night at 11:59pm, unless otherwise specified) |
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| March 19 | 1A | Course Operations;<br>VBA in Excel Environment Setup;<br>Information Systems, Decision Support Systems, and Application Software in a Business Context | Student Survey (3%) due on/before the first day of class |
| | 1B | Excel Objects: workbooks, worksheets, ranges, and cells;<br>ActiveX Controls: command buttons;<br>VBA Programming: message boxes | Week 1 Check-in (2%);<br>Excel Objects Assignment (5%) |
| March 26 | 2A | ActiveX Controls: spin buttons, scroll bars, combo boxes, and list boxes;<br>VBA Programming: variables and datatypes (e.g. booleans, strings, numbers) | |
| | 2B | ActiveX Controls: option buttons and checkboxes;<br>VBA Programming: conditional logic | Week 2 Check-in (2%);<br>ActiveX Controls Assignment (10%) |
| April 2 | 3A | Code Simplification and Refactoring;<br>VBA Programming: custom functions and sub-procedures | |
| | 3B | VBA Programming: loops and advanced datatypes (e.g. arrays) | Week 3 Check-in (2%) |
| April 9 | 4A | Validating and Handling User Inputs;<br>VBA Programming: input boxes | |
| | 4B | Project Support (Lab) | Week 4 Check-in (2%);<br>Retirement Savings Calculator (20%) |
| April 16 | 5A | VBA Programming: importing and processing data from CSV files | |
| | 5B | Project Support (Lab) | Week 5 Check-in (2%);<br>Executive Dashboard (20%) |
| April 23 | 6A | Application Programming Interfaces (APIs);<br>Computer Networking, the Internet, and the Hypertext Transfer Protocol (HTTP);<br>VBA Programming: requesting and processing data from the Internet | |
| | 6B | Project Support (Lab) | Week 6 Check-in (2%);<br>Stock Trading Rec. System (20%) |

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| April 30 | 7A | Retrospective Exercise | Industry Insights Assignment (10%) due by May 8th at 11:59pm |

# Policies

## Attendance

All students are encouraged but not required to attend class in-person. If not able to attend class in-person, students are still expected to review the assigned course materials, view the audiovisual class recordings, stay apprised of the schedule of deliverables, and participate in remote communications in Slack as applicable.

## Late Submissions and Extensions

Late submissions are generally not accepted. However, students may request a due date extension in response to extraordinary circumstances. Any student who requests a due date extension should email the professor well in advance of the original due date. Students should expect to submit deliverables on time unless the professor explicitly approves their extension request in writing.

## Final Grades

The Dean's office has mandated the maximum mean final grade in this course should be 3.5 (between A- and B+). Further guidance from the Dean's office:

> *What constitutes an A, A-, B+, etc. is determined by each individual faculty member. Unlike most undergraduate programs, there is not a standard scale of numeric to letter grades. For example, 94% and above doesn't necessarily equate to an A, 90-93% doesn't necessarily equate to an A-, etc. Generally faculty will look at the final numeric grades as a whole and look for natural breaks.*

## Learning Accommodations

Any student requiring learning accommodations, such as longer exam periods, must register and coordinate through the university's Academic Resource Center.

## Code of Conduct

Students should abide by all policies set forth by the university's Office of Student Conduct.

## Academic Integrity

Students are expected to follow the university's Honor System and Graduate School Academic Policies, as well as those set forth here.

Although students are encouraged to work with each other to discuss and solve problems, submission of identical or nearly identical work may be seen as an academic integrity infraction. And although students are encouraged to leverage Internet resources, submission of work product generated by any other person may also constitute an infraction. Furthermore, if one student violates academic integrity policies by submitting the work product of another student, both students may be considered in violation and subject to penalties.

As a rule of thumb, it is each student's responsibility to type and understand every line of code submitted for evaluation. In situations where lines of boilerplate code or shared code are included in a submission, it is the responsibility of the student to accompany such code with one or more lines of "comments" which include a source link (e.g. "*adapted from source: https://stackoverflow.com/q/2454552/670433*") or other manner of attribution (e.g. "*Rafik Hariri, rafik123@georgetown.edu, helped me with this part.*"). However, students should know that submissions comprised of significant portions of code obtained in this way, even if properly attributed, may still constitute an infraction.

Any questions about what constitutes an academic integrity infraction should be proactively directed to the professor; retroactive naivete is not acceptable. Violations of academic integrity will be forwarded to the Academic Integrity Board, and may lead to consequences such as failure or dismissal.

## Acknowledgement and Authorization

Class sessions will be recorded and distributed back to students via a university-issued platform called Mediasite. Students should be aware that audiovisual class recordings may include their image, name, and voice. Any student who would like to opt out of class recordings should email the professor within the first week of enrolling, and the professor will suggest some reasonable accommodations, which may include sitting in designated areas or opting out of in-class discussions.