GEORGETOWN UNIVERSITY McDonough
SCHOOL *of* BUSINESS

Computer-based Decision Support Systems (OPIM 557)

University:	Georgetown
School:	McDonough School of Business
Department:	Operations and Information Management (OPIM)
Course:	Computer-based Decision Support Systems (557)
Section:	20 - Tuesdays and Thursdays from 11:00am to 12:20pm in Hariri 340
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 topics related to information systems, with focus on decision-support systems.
2. Create decision-support systems in MS Excel, using native interface elements and the VBA programming language.
3. Gain marketable programming and data skills.
4. Be confident in your ability to learn any programming language.
5. Have fun!

Community

Students

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

Professor

Adjunct Professor Michael Rossetti brings professional experience as a government technology consultant, a political data analyst, and an application software engineer. Students should feel free to direct questions to the professor by sending a direct message to @prof-rossetti on Slack 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 consult online resources such as:
- VBA Language Reference (Microsoft.com)
- Excel VBA Reference (Microsoft.com)
- Learning VBA in Excel (Lynda.com)
- Intro to VBA in MS Excel (Prof Rossetti)

Students may also consult texts such as:
- Excel VBA Programming For Dummies, by John Walkenbach
- Microsoft Excel 2016 Power Programming with VBA, by Michael Alexander

Further Reading:
- The Lean Startup, by Eric Ries
- Rework, by Jason Fried and David Heinemeier Hansson
- The Design of Everyday Things, by Don Norman

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, office hours, and deliverable due dates. 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 may 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 OPIM 557 Slack organization at the beginning of the semester when invited by the professor. Students are encouraged to post questions and answers in the #section-20 channel and to monitor the #section-20-videos channel for links to class recordings. Students may optionally also join the #course-materials channel to subscribe to a news feed of updates to the course repository and the #events 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: OPIM 557 Slack Onboarding, Emoji Cheat Sheet 😃

Evaluation

Student learning will be evaluated through hands-on programming projects (74%), project peer reviews (18%), and progress check-ins (8%). Students should consult the Canvas 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.

Projects

Simple System

The *Simple System* acts as an introduction to information systems, software application development, programming with VBA in MS Excel, user interface design, and data management. Students will create an interactive GUI application which accepts user form inputs and saves corresponding records in a separate worksheet.

Retirement Savings Calculator

The *Retirement Savings Calculator*, a Decision-Support System, is a practical financial modeling tool. Students will create an interactive GUI application which combines user inputs and risk preferences, historical data, and probability, to predict how long retirement savings will last under various scenarios.

Executive Dashboard

The *Executive Dashboard*, a Decision-Support System, provides business 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 will utilize charts and graphs to help tell a compelling story.

Stock Trading Recommendation System

The *Stock Trading Recommendation System*, a Decision-Support System, processes real-time market data through a custom recommendation algorithm to provide investors with a competitive advantage. Students will create an interactive GUI application which fetches historical trading prices from the Internet, and combines them with user risk preferences to recommend whether or not to purchase a given stock or cryptocurrency.

Schedule

The schedule below is tentative and may change to reflect actual pace of instruction. The Canvas calendar will reflect the most up-to-date scheduling information, including due dates.

Date	No.	Focus
Prereq.	0	● Topics: Information Systems, Decision-Support Systems, Process Automation ● VBA Programming: Getting Started, *Macros* ● Exercise: "Hello Macro"
Oct. 30	1	● Topics: Object-oriented Programming with VBA in MS Excel ● MS Excel Objects: *Workbooks*, *Worksheets*, *Ranges* ● Interface Elements: *Message Boxes, Input Boxes, Command Buttons* ● VBA Programming: *Sub-procedures, Workbook Events* ● Exercise: "Smart Workbooks"
Nov. 1	2	● Topics: User Experience and Interface Design ● Interface Elements: *Scroll Bars*, *Combo Boxes, etc.* ● VBA Programming: Variables, Basic Datatypes (*Strings*, *Numbers*, *Booleans)* ● Exercise: "All the Controls"
Nov. 6	3	● Interface Elements: *Check Boxes*, *Option Buttons*, etc. ● VBA Programming: Conditional Logic and Control Flow (*If* statements) ● Exercise: "All the Controls" (cont'd)
Nov. 8	4	● Interface Elements: *User Forms* ● Project: **"Simple System"**
Nov. 13	5	● Topics: Code Simplification, System Maintenance, Quality Control ● VBA Programming: *Functions*, *Modules* ● Exercise: "Codebase Cleanup"
Nov. 15	6	● VBA Programming: Iteration (*Loops*, *Arrays*) ● Exercise: "Processing CSV Strings"
Nov. 20	7	● Topics: Probability, Risk, Uncertainty ● Project: **"Retirement Savings Calculator"**
Nov. 27	8	● VBA Programming: Workbook File Operations ● Exercise: "Processing Spreadsheet Files"
Nov. 29	9	● Topics: Metrics, Reporting, Data Visualization ● MS Excel Objects: *Pivot Tables*, *Charts* ● Project: **"Executive Dashboard"**
Dec. 4	10	● Topics: Computer Networks, the Internet, and HTTP ● VBA Programming: *WinHTTP Services* ● Exercise: "Processing Internet Data"
Dec. 6	11	● Topics: Application Programming Interfaces (APIs) ● Project: **"Stock Trading Recommendation System"**
Dec. 11	12	● Exercise: "Social Media Analytics Tool"

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 Panopto. 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 and adopting a different nickname during class discussions.