What This Course Covers

- Derivative security valuation
  - You will be introduced derivative security pricing including option payoffs, the Black-Scholes-Merton and binomial option pricing models, no arbitrage and the law of one price, risk-neutral valuation, Arrow-DeBrue state prices, a primer on linear algebra, and option valuation via Monte-Carlo simulation.

- Coding using Excel’s Visual BASIC for applications (VBA)
  - You will learn fundamental coding skills that are needed to solve financial problems and build models.
    This course will not cover all aspects of coding, but rather just enough to translate financial models into the VBA language. Since we only have 14 sessions the emphasis will be placed on practicality and getting the computer code up and running.
  - You will become familiar enough with coding so that you can learn other languages such as MATLAB, Python, R or STATA if your job demands it.
  - You will acquire the skill set to implement advanced financial models in VBA that you will encounter in your internship, the 4th year courses, and later in your career.

Prerequisites

Fall ICE and the math prerequisites for the McIntire School of Commerce.

Workload

This course will require a lot of work. The workload through the first half of this course will be moderate, but will increase dramatically when we get to Monte Carlo simulation in the middle of the semester. You will have trouble with the course if:

- You fail to keep up with the work. Each lecture builds on the previous week’s material. If you get behind, you are in trouble.

- You do not adjust for the increased workload in the second half of the course. This will be a stressful time since you may be looking for internships and dealing with exams and projects in other courses.
Advice

- Do not fall behind.
- Do all the assigned homework.
- Review what we did from the last class the evening before the next class.
- Read ahead in the notes.
- Get help from other classmates or the TA.
- Do not skip class because you are afraid of a cold call.

Recommended Texts and Readings

The core material for the course is available in a coursepack at the bookstore.

The one VBA book that we will use for the course is:

- *Excel VBA Programming For Dummies, 3rd edition*,
  (Buy on Amazon, free on VIRGO)

I have put a link to this book on the COLLAB site, but you may have to be on UVA’s network to access this.

I will also refer to chapters in the text that you are using for ICE, *Corporate Finance*, 11th edition, by Ross, Westerfield and Jaffe.

Honor Code

- It is incumbent upon you to make the honor code work.
- It’s what makes UVA special.
- Honor should be carried with you throughout your life, not just while you are at UVA.

Honor Code & Assignments

In addition to the obvious (no cheating on exams), I consider copying homework assignments to be a honor code violation. You are free to discuss the issues behind the problem in groups, but you MUST arrive at the solution yourself.
Mobile Phones: Please turn your mobile phone off before class begins.

Laptops: Laptops are permitted when we are doing Excel-based exercises, but are to remain closed at all other times. Being on Facebook during class will not aid your understanding of the material.

Exams: You are required to have a calculator for the final exam. A basic one from a drugstore that can do $e^x$, $x^y$, and $\ln(x)$ is sufficient and should cost $10-15. A financial calculator is allowed but won’t help compared to the drugstore variety. Mobile phones, laptops, tablet computers, etc. are prohibited during in-class exams (leave them off and in your bookbag!).

Attendance Policy

- You are required to attend all classes.
- You must come to the section you registered for.
- If you have to miss a class for a valid reason (interview or illness), please send me an e-mail and you may attend another session.
- It is not OK to switch sections to study/prepare for another class or exam.
- Note that new lectures begin every Tuesday. Thus if you have to miss a Tuesday, you may attend the following Thursday, but if you have to miss a Thursday, you should attend the PREVIOUS Tuesday.
- If you can’t make any of the 6 classes due to a legitimate reason, then please e-mail me I will mark you absent excused.

In this case, you are required to get the class notes and homework assignment from a friend and you are expected to be prepared for the next class.

Section Synchronization

- I try to keep all six sections synchronized.

Since the amount of discussion varies across sections, I may end some sections early so that I don’t run over the allotted time for other sections where there is more discussion.
Grade Determination

- Problems will be assigned for most topics and you are expected to do all assigned problems. We will typically go over the problems in class. I will randomly cold call on students the day the assignment is due and have the lucky student explain the solution to the class. Not being prepared to explain the solution will result in a zero that day for class participation.

- The following weights will be employed in grade determination:

<table>
<thead>
<tr>
<th>Description</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>Take-home exam I, Friday, 3/1 (2 hour block from 9 a.m. to 11:59 p.m.)</td>
<td>15%</td>
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<tr>
<td>Take-home exam II, Friday, 4/12 (3 hour block from 9 a.m. to 11:59 p.m.)</td>
<td>35%</td>
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<tr>
<td>Final Exam, Tuesday, 5/7, 7-9 p.m.</td>
<td>45%</td>
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<tr>
<td>Participation, homeworks &amp; attitude</td>
<td>5%</td>
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<tr>
<td>Total:</td>
<td>100%</td>
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- The final exam will be in-class, closed book, closed notes.

- While you may choose any block of time for the midterms, the block you choose must be contiguous.

- Any student who does not take an exam at the specified time and has not cleared the absence with the instructor prior to the start of the exam will receive a zero for that exam.

Rescheduling of Exams

- Please take careful note of the above examination dates. These dates are fixed and non-negotiable.

- If you currently have a conflict with one of the dates (sports schedule, etc.) let me know in writing (or e-mail) no later than Friday, January 25, 2019. If you do not notify me of a conflict by then, I will expect you to take the exam as scheduled. Failure to take a scheduled exam will result in a zero for that exam.
Instructor and Availability

- Office: Robertson Hall, 354
- E-mail: pjd9v@virginia.edu.
- Office hours: Tuesday 3:30-4:30, Thursday 3:30-4:30 and by appointment.
- Teaching Assistants: Adam Clark and Sarah Jensen.
  Office hours: Monday and Wednesday from 7-8 p.m. in classroom 260.
  The TA hours may be expanded when we get to more difficult material.

Schedule & Readings

- We will cover the finance and VBA topics below. As we move through the semester, we will use VBA to implement the option pricing models that we have covered in the finance part of the course.
  While we may deviate slightly from this schedule, it provides the structure for the course.
- The readings in the third column refer to your corporate finance text from ICE by Ross, Westerfield and Jaffe. I recommend that you read these chapters since these concepts are central not only to your coursework this year and next but also to your career.
- The readings in the last column refer to the online version of *Excel VBA Programming For Dummies, 3rd edition*, available for free on-grounds. The URL is on page 2 of the syllabus and also on COLLAB.
  - You should read those sections listed below as we cover each topic, especially if you are new to coding.
  - The sections labeled (skim) don’t have to be read word-for-word, just skim them to get an idea of what is going on. right-hand column.
  - There are many topics that we will not cover in class due to time constraints; I encourage you to read and go beyond what we cover in class.
Readings

- “CP” refers to the coursepack from the bookstore.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Chapters in CP</th>
<th>Chapters in RW &amp; J</th>
<th>VBA Programming for Dummies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
<td>Ch1: Okay, So What Is VBA?</td>
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<td>Ch1: What Can You Do with VBA?</td>
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<td>Ch1: Advantages and Disadvantages of VBA</td>
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<td>Writing functions in VBA</td>
<td>2</td>
<td>Ch1: VBA in a Nutshell</td>
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<tr>
<td>Option fundamentals</td>
<td>3</td>
<td>22.1 to 22.7</td>
<td>Ch9: What Is a Function?</td>
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<td>VBA &amp; the Black-Scholes-Merton model</td>
<td>4</td>
<td>22.8</td>
<td>Ch9: Using Built-In VBA Functions (skim)</td>
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<td>Expectation and variance operators</td>
<td>5</td>
<td></td>
<td>Ch9: Using Worksheet Functions in VBA (skim)</td>
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<td>If-statements, printing and loops</td>
<td>6</td>
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<td>Ch9: Using Custom Functions</td>
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<td>Some useful functions</td>
<td>7</td>
<td>Ch10: Decisions, Decisions</td>
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<td>Arrays in VBA</td>
<td>8</td>
<td>Ch10: Knocking Your Code for a Loop</td>
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<tr>
<td>Binomial option pricing</td>
<td>9</td>
<td>22.8</td>
<td>Ch7: Working with Arrays</td>
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<td>Coding the binomial model (optional)</td>
<td>10</td>
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<tr>
<td>Subroutine macros</td>
<td>11</td>
<td>Ch8: A Quick Review</td>
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<td>Ch8: Other Ways to Refer to a Range</td>
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<td>Ch8: Some Useful Range Object Properties</td>
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<td>Ch8: Some Useful Range Object Methods</td>
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<td>Monte Carlo simulation</td>
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<tr>
<td>Basic linear algebra</td>
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<tr>
<td>Discounting for time</td>
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<tr>
<td>Discounting for risk</td>
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<tr>
<td>VBA Function and Keyword Reference</td>
<td>16</td>
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