

# Introduction to Business Statistics

## Course syllabus

<b>Time</b>	Mon Thu 5 <sup>30</sup> – 6 <sup>45</sup> pm and Wed 5 <sup>30</sup> – 6 <sup>30</sup> pm
<b>Room</b>	DMTI 215 (Meyers Building on the East Campus)
<b>Instructor</b>	<a href="#">Michael Baron</a>
Office	DMTI 106-D
Office hours	Mon 7:00-8:00 pm; Thu 4:15-5:15 pm and 7:00-8:00 pm
Phone	202-885-3130
Email	<a href="mailto:baron@american.edu">baron@american.edu</a>

### Textbook

Statistics for Managers Using Microsoft Excel, 8<sup>th</sup> edition (2016)  
by D. Levine, D. Stephan, and K. Szabat.

[Ebook comes free of charge with MyStatLab registration which is required for homework and midterm tests](#)



### Supplementary materials:

MyStatLab [www.mystatlab.com](http://www.mystatlab.com)

Ebook, online homework and midterm exams, numerous practice exercises, study plan, online reviews (see the last page for instructions).

Course site <http://fs2.american.edu/baron/www/204/>

Links, lecture slides, Excel instructions, data sets, and other materials.

Blackboard [blackboard.american.edu](http://blackboard.american.edu)

Grades, solutions, discussions, chats.

**Course description:** Statistical concepts and methods used in business decision making. Topics include probability rules, discrete and continuous distributions, descriptive and graphical statistics, estimation, confidence intervals, hypothesis testing, analysis of variance, regression, and applications of MS Excel data analysis tools to economic and business data. AU Core Foundation: Quantitative Literacy I. Prerequisite: MATH-15x.

**Learning objectives:** Students will learn how to assess uncertainty in business related situations; use basic probability rules and suitable distributions to compute probabilities; summarize business type datasets (with graphical methods and numerical quantities); choose appropriate statistical methods and conduct statistical inference for the solution of business decision problems based on random samples; interpret results (writing complete sentences to summarize results obtained from data analysis; and use Microsoft Excel data analysis tools for the implementation of statistical routines.

### Course schedule (can be slightly modified during the semester)

Aug 26 – 28	Introduction. Population and sample. Statistics and data in Business and Management Practice.	Ch. 1 (just read)
Aug 29 – Sep 6	Summarizing and visualizing data. Descriptive and graphical statistics. <i>Labor Day on Sep 2</i>	Ch. 2-3 (2.1-2.5, 3.1, 3.2)
Sep 9 – 13	Probability rules. Unions, intersections, complements. Bayes rule and the law of total probability.	Ch. 4 (4.1-4.4)
Sep 16 – 20	Random variables and distributions. Applications to Finance.	Ch. 5 (5.1, 5.4)
Sep 23 – 27	Discrete distributions. Binomial and Poisson distributions, their properties and main applications.	Ch. 5 (5.2 - 5.3)
Sep 30 – Oct 4	Normal distribution. Estimation of parameters. Distribution of sample means.	6.1-6.3, 7.1-7.2
Oct 7 – 11	Confidence intervals for the population means. The case of unknown variance and t-distribution. <i>Midterm #1 (Descriptive statistics, probability rules, random variables, and distributions.)</i>	Ch. 8 (8.1-8.2, 8.4-8.5)  <i>Ch. 2-6</i>
Oct 14 – 18	Hypothesis testing. Type I and Type II errors. Significance level and power. One-sample tests for a population mean. One-tail and two-tail tests.	Ch. 9 (9.1-9.3, 9.5)
Oct 21 – 25	Comparison of two populations. Two-sample confidence intervals and tests of hypotheses.	Ch. 10 (10.1-10.2, 10.4)
Oct 28 – Nov 1	Inference for proportions. Distribution of a sample proportion. Confidence intervals, required sample size. Tests. Comparison of two proportions.	7.3, 8.3-8.4, 9.4, 10.3
Nov 4 – 8	Comparison of several populations. One-way analysis of variance. Two-way analysis of variance. Main effects and interactions. <i>Midterm #2 (Estimation, confidence intervals, hypothesis testing)</i>	Sec. 11.1, 11.2  <i>Ch. 7-10</i>
Nov 11 – 15	Two-way ANOVA continued. Handling interaction effects. Contingency tables and chi-square tests for independence.	Sec. 11.2 12.1 - 12.3
Nov 18 – 25	Simple linear regression. Predictor and response. Inference about regression model. Analysis of residuals. Variance components, coefficient of determination (R-square).	Ch. 13 (13.1-13.5)
<i>Nov 27 – 28</i>	<i>Thanksgiving Break</i>	
Dec 2 – 4	Multiple linear regression. Variable selection. Regression forecasts.	Ch. 14 (14.1-14.6)
Dec 5	Conclusions and business applications. Preparation for the Final Exam.	Ch. 17 + review
<i>Dec 9, 5:30</i>	<i>Final Exam covers Statistics (chap. 8-14), but it is cumulative indirectly</i>	<i>Ch. 8-14 (and 2-7)</i>

### Quizzes and Exams:

Quiz 1	Sep 5	Quiz 5	Oct 3	Quiz 8	Oct 31	Quiz 11	Dec 5
Quiz 2	Sep 12	<b>Midterm #1 on Oct 7-13</b>		Quiz 9	Nov 7	<b>Final Exam – Dec 9, 5:30-7:30, in Meyers room 215</b>	
Quiz 3	Sep 19	Quiz 6	Oct 17	<b>Midterm #2 on Nov 11-17</b>			
Quiz 4	Sep 26	Quiz 7	Oct 24	Quiz 10	Nov 21		

## Grading:

Class participation	10%	Calculated based on your attendance and activity - coming to the class on time; giving <i>an answer</i> when asked a question; giving <i>correct answers</i> .
Weekly homework	10%	Assigned and submitted via <i>MyStatLab</i> . Due every Thursday (Thanksgiving exception).
Weekly quizzes	20%	10-minute quizzes every Thursday. The lowest quiz is dropped. Each quiz covers the material of the preceding week and the latest homework. Taken in class. Closed-books, closed-notes, and closed-Excel. <i>One cheat sheet with formulas is allowed.</i>
Two midterm exams	15% each	Each midterm covers several chapters of the material. Taken online ( <i>MyStatLab</i> ), within a given one-week slot.
Final exam	30%	The Final exam covers the Statistics part of the course, but it is cumulative indirectly. Taken <i>in class</i> during our Final Exam time slot.

93 – 100 % = A

90 – 93 % = A-

87 – 90 % = B+

83 – 87 % = B

80 – 83 % = B-

77 – 80 % = C+

73 – 77 % = C

70 – 73 % = C-

60 – 70 % = D

0 – 60 % = F

**Software.** As part of the course, we make use of probability and statistics tools of *Microsoft Excel* for analyzing and representing data, conducting statistical inference, and computing probabilities and critical values. This includes a number of Excel functions as well as the special *Data Analysis Toolpak* (it may be hidden; I'll show how to find and activate it). We'll use the Toolpak for histograms, descriptive stats, T-tests, chi-square tests, ANOVA, and regression. The book has detailed instructions for Excel, and of course, we'll discuss all the tools in class. You are allowed and encouraged to use Excel for certain parts of homework and midterm exams, especially the *mini-projects* and *case studies* (analysis of real data) contained in them.

**Rules.** On quizzes and the final exam, *show your work*. I will grade your solutions, not your answers. Therefore, no work – no credit.

*No late assignments*. However, it is possible to take an exam or quiz early, for a good reason such as a business trip or a religious holiday. So, please plan ahead.

*No electronic devices* during lectures, exams, and quizzes, except for the course purposes. No iPods, telephones, playstations, and other gadgets, please. For exceptions, ask me for permission.

Calculators are allowed. Any simple calculator is absolutely sufficient.

According to the University's Academic Integrity Code, I am required to report cases of *academic dishonesty* to the Dean of the College of Arts and Sciences. AU's academic code is found at <http://www.american.edu/academics/integrity/>

Collaboration on a homework is ok. Even encouraged! Quizzes and exams are to be done individually.

**Tips.** A steady effort to review material and work out all the assigned problems is your best chance to succeed in this course. Believe me or ask former Business Statistics students! Always keep up with the course because every piece of material is built upon the previously covered concepts.

Every week, complete your homework before the quiz, so you will be better prepared for it (and you have to do the homework anyway). Do not procrastinate till the last hour - what if the internet suddenly fails?

Use your absolute right to ask questions in class and during office hours. For example, any homework problem can be discussed.

For each exam and quiz, review all the new concepts, methods, formulas, etc. Try to understand the methods rather than to memorize them.

For each quiz, prepare a brief summary of important formulas and methods that you may need. Arrange it on a single sheet of paper in the most convenient way. No other materials are allowed for the quizzes. Do the same for each exam! Such summaries will help you use your exam time efficiently.

**Emergency Preparedness.** In the event of an emergency, students should refer to the AU Web site (<http://www.american.edu/emergency>) and the AU information line at (202) 885-1100 for general university-wide information. In case of a prolonged closure of the University, I send updates to you by email and will post all announcements on the course web site.

**Support Services.** A wide range of services is available to support you in your efforts to meet the course requirements.

- *Mathematics & Statistics Tutoring Lab* provides tutoring in Mathematics and Statistics. Room Meyers-103; [www.american.edu/provost/academic-access/mathstat.cfm](http://www.american.edu/provost/academic-access/mathstat.cfm).

Lab hours are Mo-Th 11 am – 8 pm, Fr 11 am – 3 pm, and Su 3 pm – 8 pm.

- *Academic Support and Access Center* (x3360, MGC 243) offers study skills workshops, individual instruction, tutor referrals, writing support, and technical and practical support and assistance with accommodations for students with physical, medical, or psychological disabilities. Open Mon-Thu 9:00 am – 7:00 pm and Fri 9:00 am – 5:00 pm. <https://www.american.edu/provost/academic-access/>

Writing support is also available in the Writing Center, Battelle-Tompkins 228.

- *Counseling Center* (x3500, MGC 214) offers counseling and consultations regarding personal concerns, self-help information, and connections to off-campus mental health resources. <https://www.american.edu/ocl/counseling/>
- *Supplemental Instruction sessions* – the time and place are TBA (to be announced) soon. A well-prepared supplemental instructor will be there specifically to help students of this course, Business Statistics, with the material, will solve extra exercises, answer your questions, and provide you with extra practice.

# **Instructions for the MS Excel's DATA ANALYSIS TOOLPAK**

## **Excel 2010-2016**

1. Click on the green File tab. The File tab in Excel 2010 replaces the Office Button (or File Menu) in previous versions of Excel.
2. Click on Options.
3. Under Add-ins, select Analysis ToolPak and click on the Go button.
4. In the Add-Ins available box, check Analysis ToolPak and click on OK.
5. On the Data tab, you can now click on Data Analysis and use it!

## **Excel 2007**

1. Click the Office button and then click the Excel Options button.
2. Click the Add-Ins tab in the left pane.
3. Select Excel Add-Ins from the Manage drop-down list (at the bottom) and click Go.
4. Select the Analysis ToolPak check box in the Add-Ins dialog box and then click the OK button.
5. If an alert dialog box asking you if you want to install the add-in appears, click Yes.

## **Excel 2003**

1. On the Tools menu, click Add-Ins.
2. In the Add-Ins available box, select the check box next to Analysis Toolpak, and then click OK.
1. Tip: If Analysis Toolpak is not listed, click Browse to locate it. If you see a message that tells you the Analysis Toolpak is not currently installed on your computer, click Yes to install it.
3. To use the Toolpak, click Tools on the menu bar. When you load the Analysis Toolpak, the Data Analysis command is added to the Tools menu.

## **Special Note for Mac Users**

Mac has Excel, and **Excel 2016-2019** has the Data Analysis Toolpak *identical* to the MS Excel.

Any release of Mac's Excel before 2016 lacks the Data Analysis Toolpak. A free solution is to go to the site <https://www.analystsoft.com/en/products/statplusmacle/> and install *StatPlus:Mac* from it. This serves as an addition to Mac's Excel with all the Toolpak capabilities.

After installation, activate it in Excel by going to Tools -> Add-Ins -> Analysis Toolpak.

# MyStatLab Instructions

To register for **Introduction to Business Statistics, section 010 (M. Baron)**:

1. Go to [www.pearson.com/mylab](http://www.pearson.com/mylab).
2. Under Register, select **Student**.
3. Confirm you have the information needed, then select **OK! Register now**.
4. Enter your instructor's course ID: **baron51564**, and **Continue**.
5. Enter your existing Pearson account **username** and **password** to **Sign In**.

You have an account if you have used a Pearson product, for example: MyMathLab, MyITLab, MyPsychLab, MySpanishLab or Mastering, such as MasteringBiology.

If you don't have an account, select **Create** and complete the required fields.

6. Select an access option.

Use the access code that you purchased from the bookstore, or buy access using a credit card or PayPal account.

If available, you can get a 14-day temporary access. (The link is near the bottom of the screen) Well, it won't extend beyond 14 days, and you will need access for the entire semester.

7. From the You're Done! page, select **Go To My Courses**.
8. On the My Courses page, select the course title **Stat-204, section 10 (Baron). Introduction to Business Statistics** to start your work.

**To sign in later:**

1. Go to [www.pearsonmylabandmastering.com](http://www.pearsonmylabandmastering.com).
2. Select **Sign In**.
3. Enter your Pearson account **username** and **password**, and **Sign In**.
4. Select the course name **Stat-204, section 10 (Baron). Introduction to Business Statistics** to start your work.

**To upgrade temporary access to full access:**

1. Go to [www.pearson.com/mylab](http://www.pearson.com/mylab).
2. Select **Sign In**.
3. Enter your Pearson account **username** and **password**, and **Sign In**.
4. Select **Upgrade access** from the course course name **Stat-204, section 10 (Baron). Introduction to Business Statistics**.
5. Enter an access code or purchase access with a credit card or PayPal account.

For MyStatLab extra help, see

<https://www.pearsonmylabandmastering.com/northamerica/mystatlab/students/support/>