

**BIOL 200 001 QUANTITATIVE BIOLOGY - Official Syllabus  
Spring 2017 - Online Course delivered via Blackboard (Bb)**

You will have ONE of the following Course Instructors:

Joseph Battistelli, Ph.D.  
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Office Hours & Location: See Blackboard for your instructor's office hours, location and email.

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**Course Description:** 3 lecture hours (100% online). 3 credits. Prerequisites: BIOL 151, BIOZ 151 and MATH 151. Introduction to the application of the scientific method, experimental design and quantitative aspects of biology. This course focuses on quantitative skills that are relevant to the biological sciences by introducing basic scientific reasoning, quantitation and data analysis

**General Course Goals:** By the end of the semester, you should be able to:

- Develop biological hypotheses and design experiments to test hypotheses.
- Implement inductive and deductive reasoning when interpreting data with regard to a scientific hypothesis.
- Interpret graphs based on biological data and derive biological explanations.
- Apply and evaluate basic statistics in an experimental framework.
- Given an example, calculate and explain basic statistics used for analysis.

**Reference Materials** Except for the optional textbook, the other reference materials are freely available online. Other course material, such as lecture videos will be posted on Blackboard.

- **Free pdf:** [Introductory Statistics](#) from OpenStax
- **Free pdf:** [Handbook of Biological Statistics](#) by John McDonald
- **Free online pages:** [GraphPad Statistics Guide](#) by H. J. Motulsky (only the reference guide - you do NOT need to purchase the software).
- **Rent from Amazon (optional):** [Biostatistics for the Biological and Health Sciences](#) Triola & Triola, Pearson, Addison & Wiley - this is an optional textbook, you do not have to rent or purchase.

**Course Topics:** This is an outline of the topics covered in this course and the order in which they will be covered. Please be aware that topics are subject to change and that any changes will appear in the course units and not on this schedule. Notifications of changes will be given as soon as possible.

Unit I: Scientific Method	How Scientists Study Life
	Scientific Reasoning: Inductive vs. Deductive Logic
	Designing Experiments
	Measurements: pH, Dilutions and Molarities
Unit II: Data, Sampling and Probabilities	Types of Data: Nominal, Ordinal, Continuous and Discrete
	Samples & Populations
	Calculating Probabilities
Unit III: Quantification of Data Patterns	Measures of Central Tendency

	Graphing Data and Interpreting Graphs
	Dispersion and Variability
	Covariance and correlation
Unit IV: Basic Statistical Inferences	Hypothesis Testing
	Statistical Tests: Chi-Squared
	Normal Distributions
	Statistical Tests: <i>t</i> -tests

**How to Succeed in the Course:** The course is designed as intuitively as possible using the Learning Management System currently available, which is Blackboard. Students can find everything they need under the “Main Menu/Start Here” navigation link. All other navigation links are shortcuts to frequently used areas of the course. Students who do the following will greatly enhance their success in the course:

- Have excellent time-management skills - a calendar with a suggested schedule as well as hard deadlines can be found here: [Course Calendar](#).
- Students should work on assignments in advance of the due date rather than waiting until the last minute. Do not procrastinate on assignments.
- Thoroughly read the instructions/criteria and submit every part of the assignment.
- Read instructor emails - the weekly (and sometimes twice or thrice weekly) emails are helpful reminders for students to check the gradebook, etc to make sure all assignments have been submitted in time in order to avoid zeros. A copy of all course-wide emails are posted to the Announcements page.
- Study Tips for Exams: You have access to all the assignments, and you can review all of your quizzes by clicking on the assignment - it will give you the option to review it. If you're wanting to commit information to memory, you must do more than just read chapters/watch videos - you need to take written notes - handwritten note-taking is more effective than typing when you're trying to commit information to memory. Creating your own essay exams, calculation questions, etc. and then taking them, will help you figure out areas you may be weak in and then go back and study more in those weak areas. Here is a link to some great study tips: <http://www.cod.edu/people/faculty/fancher/STUDY.HTM>

**Technical and/or Computer Skills Required:** Other than being able to use Excel or Google Sheets (or similar spreadsheet for calculations), this course does not require special technical skills - links are provided where applicable and there are no assignments that require any special computer skills beyond using Excel or Google Sheets (tutorials will be provided). The course is designed as intuitively as possible, however, if

ever you find yourself confused about where an assignment is located, etc, please feel free to email your instructor and they'll be happy to help.

**Instructor Availability:** It is important that students are able to contact instructors in online classes and expect a response in a reasonable amount of time. Your instructor's availability is posted on Blackboard. If you don't hear back from your instructor within 48 hours (except weekends and holidays), please email them again.

**Weekly Time Commitment:** The amount of work students are expected to put forth in this class is based on Section 600.2 and 600.24(f) of the Higher Education Opportunity Act which states (in part) that a unit of credit is: "An amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately ... ten to twelve weeks for one quarter hour of credit or the equivalent amount of work over a different period of time." Which is a fancy way of saying a 3 credit course expects you to put in a minimum of 9 hours per week (thus the reason 12 credits is considered full time is because that's a minimum of 36 hours per week.)

**Estimated Times for Completion of Assignments:** Each assignment will have an estimated amount of time that it takes the average well-rested, well-focused, uninterrupted student to complete. What this means is that it may take you more, less or the estimated time. How much time it actually takes you personally, can depend on things such as how many times you were side-tracked while doing the assignment (answering texts, browsing facebook, etc.), how you felt that day (tired from not enough sleep the night before, etc). Please plan accordingly.

**Note to DSS Students:** This online course was developed with the concept of [Universal Design](#) as a primary goal. Other than exams, no other assignments are timed, and they are available in advance of their due date. All assignments have an "estimated time to complete" to give students a basic idea of how long an assignment might take - it is up to each student to determine if more time is needed to complete assignments before the due date. The exams are timed, but double time is already included (the exams are normally about 35-40 questions, with the expectation that it would take 1.5 hours, so the timer is set for 3 hours.). The Universal Design of the course means that most DSS students find that the course already accommodates their specific needs; however, if you believe you still require additional reasonable accommodation(s), please provide your instructor with the appropriate documentation from Disability Services with enough time to make the necessary adjustments.

#### **Assignment Types, Weights, Due Dates & Late Policies:**

- All due dates follow VCU time (Eastern Time). There's a suggested MWF schedule for quizzes to help you keep up with the work; however, there are hard deadline. Except for most of the the Preliminary Assignments (which are due on a Friday), hard deadlines always fall on Mondays and Wednesdays at 2pm - once you figure out the pattern, it should help you with time management. If you prefer to work on weekends or at night - that's easily accommodated - just work in advance of the deadlines on the days/times that work best for you.
- A [suggested schedule](#) is provided to help you manage your time and help keep you working ahead rather than falling behind. You are expected to work on assignments weekly, not wait until the due date or you risk zeros since assignments cannot be made up after the due date.

- **These are the 3 main assignment types and weight towards your letter grade:**

**2.5% Preliminaries**

**47.5% Course Assignments (Quizzes, Discussions & Case Studies)**

**50.0% Exams**

- **PRELIMINARIES:** The Syllabus Quiz will help familiarize you with course policies, the Academic Integrity Quiz will help remind you of the Honor Code, and the Icebreaker will not only allow you to introduce yourself to your classmates, it will give you practice with the format of the discussion board and that you must complete an honor report after each discussion in order to receive a grade.
  - **Weight towards grade:** Each preliminary assignment will be equally weighted regardless of the differences in point values, they will be averaged and will count 2.5% of your overall grade.
  - **Due Dates for Preliminaries:** See the [calendar](#) for when Preliminaries are due.
    - **Late Policy for Preliminaries:** There is no late policy for the syllabus quiz or academic integrity quiz, however, you will not be able to start the course until you complete these assignments (if you don't get these assignment submitted before the Unit 1 assignment deadlines, you won't be able to do those assignments either, and so forth...). The Icebreaker may not be submitted late.
- **COURSE ASSIGNMENTS:** During this course you will be completing multiple course assignments in each course unit. These will consist of quizzes, discussions and case studies (with accompanying honor reports for the discussions and case studies). Course assignments are based on content and reading and/or video comprehension.
  - **Quiz Strategies:** For all quizzes, you can see the quiz questions in advance so that you can concentrate on the accompanying reading/video. For most quizzes, there are up to 3 attempts allowed, all attempts being averaged - each quiz will state whether or not multiple attempts are allowed and the grading policy. The quiz questions are randomly pulled from pools. The 3 attempts are to allow you to see more questions and get more practice understanding the content. The best strategy is to do all 3 attempts, even if future attempts lower your average slightly, because doing all 3 attempts will help you better prepare for the exam. There are a couple of different strategies that might work for you and you should experiment to see which works best - you can do all attempts at once while you're concentrating on that particular material, or you can do one attempt per week for each quiz in a unit - which lets you space out your studying.
  - **Reporting Answer Key Mistake:** If you believe there's an error on the answer key, or you wish to have your answer considered as correct, you must send your instructor an email no later than the day that the quiz is due. Additionally, at any point in the semester, if an answer key needs to be corrected, everyone's score on any and all attempts, quizzes and exams that the question appeared will be updated - this may or may not benefit you, so it's in your best interest to report a potential problem with the key. We've been working hard to make sure this doesn't happen, but sometimes mistakes do happen and we will correct it as soon as it's brought to our attention.
  - **Weight towards grade:** Each course assignment will be equally weighted regardless of the differences in point values, they will be averaged and your assignment average will count 47.5% of your overall grade.
  - **Due Dates for Quizzes:** quizzes are always due on Wednesdays at 2pm (a unit is due approximately every 2.5 - 3 weeks over the semester - see [calendar](#) or Blackboard for

actual dates). All quizzes in each unit are due on the same day - this is not so that you can wait to do them all on one day (that would be unwise), but rather to allow you flexibility for when you want to do them as long as they're done by the due date.

- **Late Policy for Quizzes:** quizzes may not be submitted late for any reason. Working on assignments well in advance of the due date is imperative if you want to avoid zeros. Waiting until the last minute, then getting sick or having computer problems, and not being able to do your work by the due date is NOT an excuse as you should have been working on them each week in advance of the due date.
- **Due Dates for Discussions:** except for the Icebreaker Introductions, discussions run over a 6 to 8 day period, Wednesday- Monday (or the following Wednesday depending on how many rounds of comments there are). The initial post is due by 2pm on Wednesday, and comments must be finished up five days later on Monday at 2pm (or Wed at 2pm if there's a second round of comments). Discussion boards will open the week before the initial post is due so that you can submit early if you want to.
  - **Late Policy for Discussion Boards:** discussion board initial posts may be submitted late for a penalty through 2pm on Monday (the first round of comments if more than one round); however, initial posts may not be submitted after that, and may not be made-up for any reason (you can't have a discussion after-the-fact!)
- **Due Dates for Honor Reports (Self-Evaluations):** in order to receive a grade for the discussions, you must submit a corresponding honor report. Honor Reports are due within 30 minutes of the comment period deadline - see Blackboard for due dates.
  - **Late Policy for Honor Reports (Self-Evaluations):** Late honor reports will receive a 10-point late penalty if it happens more than once and will be checked for accuracy and grade adjusted accordingly, including a zero and potential honor violation if accuracy has the appearance of violation.
- **EXAMS:** Exams are timed. The timer is set for 3 hours which is plenty of time to take short breaks as needed, get to another computer if yours goes down, etc. There will be four end-of-unit exams (cumulative). You may use your notes, but not each other or outside help. Exams are set for 2 attempts - this is a safety-net that allows you to essentially reset your exam if you run into an issue (accidental submission of the first attempt before you were ready). Note: this is NOT "highest grade" - you should only submit a second attempt if there's an issue with the first attempt, as the second attempt is the score that will be recorded. Additionally, if the deadline has passed, you will not be able to launch a second attempt, so please do not wait until close to the deadline to do your exams.
  - **Weight towards grade:** Each exam will be equally weighted regardless of the differences in point value, they will be averaged and your exam average will count 50% of your overall grade.
  - **Due Date for Exams:** exams are open for a 3 day period only that runs from noon on Sunday to 2pm on Wednesday (see calendar).
    - **Late Policy for Exams:** Exams may not be submitted late. If you miss an exam due to an accident that requires overnight hospitalization or some other equivalent incapacitation over the 3-day period that the exams are open, you must notify the instructor within 24 hours of your release from the hospital along with appropriate documentation. It is at the instructor's discretion of the format of the make-up exam (oral, written or online), within what time period you need to make it up

(immediately or take an incomplete), and whether or not you will be required to take it in person, etc.

### Grading Scale:

Your grade will be automatically assigned as follows:

90-100% = A                      80-89% = B                      70-79% = C                      60-69% = D  
Below 60 = F

Grades within ½ of a percentage point will be rounded up. Grades under ½ of a percentage point will not be. Grades are non-negotiable. No extra credit except for doing the course evaluations, which will be explained on Bb.

**Gradebook:** It is the student's responsibility to check the gradebook after submitting each assignment and/or honor report to make sure that it was submitted properly – either a grade or a “needs grading” icon (exclamation point) will indicate that the assignment was submitted. If you see a dash “—” or a blue “in progress icon” that means you have not submitted the assignment.

### Quiz & Exam Question Types:

- **Multiple Choice:** if more than one answer appears to be correct, choose the BEST answer that most thoroughly addresses the question.
- **Multiple Answer:** choose all that apply. There will always be at least one correct answer.
- **True/False | Yes/No:** If choosing true or yes, make sure the entire question is true or correct.
- **Fill-in-the-Blank:** do not use all caps unless appropriate for acronyms (ie, DNA). Spelling counts! No credit for misspellings. Correctly spelled synonyms and alternate tenses/variations will be considered - email your instructor if you think your answer should be included in the answer key.
- **Calculated Formula/Numeric:** input numbers only - do not spell out.
- **Jumbled Sentence:** if more than one answer appears to be correct, choose the BEST answer that most thoroughly addresses the question.
- **Matching:** if more than one answer appears to be correct, choose the BEST answer that most thoroughly addresses the question.
- **Ordering:** chronological order means from the earliest date to the most recent. Not all are chronological order - some may state from the most recent to the oldest, so pay attention to the question being asked - credit will not be given for answers put in the reverse order of what the question asked.
- **Short Answer:** provide a brief answer that addresses all parts of the question

**Syllabus as Binding Contract:** Instructors are bound by the Rules & Procedures of the University to follow the policies in the syllabus. Likewise, by taking the course, you are agreeing to be bound by the policies in the syllabus as well. Because the syllabus is a binding contract, there are no exceptions to any of the policies on the syllabus.

**Online Conduct & Netiquette:** Students are expected to conduct themselves with the utmost courtesy toward their fellow students and instructor at all times, and should expect the same in return. VCU policy prohibits any member of the VCU community from sending unlawful emails (unlawful includes email deemed harassing, or worse.) The 3-C's of Netiquette must be followed when posting in the discussion board.

Violation of any of these rules will have consequences that negatively affect your grade (including zeros and possible termination of your privilege to participate in any group discussions.)

### **3-C's of Netiquette**

- **Clarity:** your post title must be descriptive and relevant to the topic you chose so that anyone who is browsing posts should be able to tell what the post is about just by your title. Be creative so that your peers want to read your post (though make sure the title still reflects your topic); alternatively you can write a short sentence for your title that adequately reflects your topic.
- **Confidentiality:** treat all information shared as confidential (though it's not suggested that you post confidential information).
- **Courtesy:** be courteous to one another - even if you disagree with what someone has posted, do so in a courteous and respectful manner.

**Academic Integrity Statement:** Honor violations are taken very seriously in this class. It is extremely important in all classes, but also in online classes, to maintain academic integrity or the course becomes worthless. As such, there are several behind-the-scenes "honesty checks" that are performed throughout the semester. For Honor Reports and the like, it is extremely important that you are honest and accurate with your reporting because any error could be construed as an honor violation. Do NOT fudge on your reports - claiming you did 3 comments when you only did 2 may not seem like a big deal to you, but in certain circumstances, could result in an F in the class and a mark on your transcript. If you make an error on your honor report that results in more points than you deserve, your grade will be manually adjusted to include losing all points (it's at the instructor's discretion how many points are deducted), and the instructor will also submit honor violation charges if the honor report has the appearance of academic integrity issues.

For first time offenders found guilty of an honor violation, the [recommended punishment is an F in the class with a mark on the transcript](#) - and yes, that includes just fudging on your honor report. If you have been dishonest on more than one honor report, you could face suspension from the university. Additionally, we have 2 years to report an honor violation - so don't think that just because you haven't been caught it right away, that you're "home-free." If you commit an honor violation, you may [self-report under the "self-referral policy"](#) to the Office of Student Conduct and Academic Integrity; however, if your instructor report first, you may not use that option.

One last thought on this - more and more students are having others do their work in online classes (either by paying someone or some other arrangement) - please note that this is **grounds for expulsion** from the university along with degree revocation if discovered after you have graduated - you don't want to go this route, and if you know anyone who is doing this you are required by university policy to report them.

**Attendance Policy:** Though this class does not meet in a classroom, students must demonstrate presence. Presence is demonstrated by doing ALL of the following three things: logging into the Bb course weekly, working on assignments weekly, and subsequently submitting them weekly. A student is in violation of the attendance policy if they fail to demonstrate all 3 components of presence. (Note: Students working ahead are not in violation.) If violation occurs frequently or if absence is extended and you have not reached out to your instructor, you may be administratively withdrawn from the course without notice, or you may be assigned a grade of "F" at the end of the semester, regardless of what your grade actually is.

**Computer / Internet Access Policy & Submission of Assignments:** You must have an appropriate computer ([click here to see VCU's student computer policy](#)) to use for completing assignments in this course. Do NOT use the Blackboard App, Smartphones, tablets, iPads, etc as there is a problem with

posting and quizzes, etc. This is an online course and thus it is your responsibility to make sure you complete assignments on time. It is your responsibility to have access to high-speed internet to complete your assignments – even in unexpected events such as power outages. You can always work on assignments in advance – so waiting until the last minute and then having unexpected problems is not an excuse for being unable to submit an assignment. It is required that you have several back-up plans in place in case there is an unexpected problem so that you have access to another computer (if your computer crashes), access to the internet (if a storm knocks out power), etc. – more information about this can be found on Bb under Tech Support.

All work must be submitted online via the appropriate Bb assignment link. Assignments hand-delivered, sent via email or posted under the wrong assignment link are not appropriate submissions and will most likely result in zeros. Keep in mind your instructor availability - whether or not they are available during the day, evenings or weekends (some are, some aren't) when working on assignments close to the due date. If you run into technical issues, there is helpful Tech Support info under one of the main navigation buttons.

#### **Requesting corrections to grades/honor reports:**

- Students are responsible for accurately reporting/submitting their work. The instructor reserve the right to refuse to correct any honor report in your favor, especially if you continue to make similar mistakes. The instructor reserve the right to deduct 10 points on any honor report that they are asked to fix because you made a mistake.
- Quizzes will not be reset nor "corrected" - you must use the appropriate device/system requirements to submit your quizzes (do not use smartphones, do not use apps - not even the Bb app, etc.) Do not submit quizzes until you double-check all of the questions and make sure the answers you want are actually selected (and the ones you don't want are not selected.) Credit is not given for most spelling mistakes on fill-in-the blank questions. If you are having an issue - contact your instructor BEFORE you submit so that they can help you figure out what the problem is (unless you are nearing the due dateperiod - in which case better to lose points on a question or two than risk a zero.) Blackboard NEVER changes your answers or makes mistakes on your quizzes if you are using the appropriate university-approved computer requirements - which is a requirement of this class, therefore, grades to quizzes are never adjusted (unless there is a mistake on the answer key.)
- If you believe there's an error on the answer key, or you wish to have your answer considered as correct, you must send your instructor an email (or use the "[Report Question Problem](#)" link on Bb) no later than the day that the quiz is due.

**Financial Responsibility:** Any student enrolled in the course must be financially responsible for all costs associated with the course including tuition, fees, textbooks, video rental or purchase, etc. The costs of of the course materials have been researched and selected for the best options for the price – including legitimate free options when available. If you are unable to purchase required materials for the course, you should consider dropping the course as instructors cannot provide exceptions to assignment due dates.