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# STAT 305
# 2020/2021, Term 2
# Instructors: Benjamin Bloem-Reddy and William Welch

**This draft outline is from 2019-20 and assumes regular classroom teaching and learning by is resumed in Term 2.  It will be updated closer to January 2021; the revisions will be substantial if Term 2 is web-based.**

**Description:** Review of probability theory. Sampling distribution theory, large sample theory and methods of estimation and hypothesis testing, including maximum likelihood estimation, likelihood ratio testing and confidence interval construction. [3-0-1]

**Prerequisites**: Either (a) one of Stat 200, Stat 203, Biol 300, Stat 241, Stat 251, Comm 291, Econ 325, Frst 231, Psych 218, Psyc 366, and one of Math 302, Stat 302;  or (b) a score of 65% or higher in one of Math 302, Stat 302 (the Department recommends that students meet the prerequisite through option (a). )

**Textbook/course material: "**STAT 305, Introduction to Statistics Inference" by Welch, W.J. A 2019 edition is available in the bookstore (**may change**).  A CLICKER IS REQURIED FOR THIS COURSE.

**References:** "Mathematical Statistics and Data Analysis: (3rd edition) by Rice, J.A., on reserve at the Barber library

**Website:** canvas.ubc.ca

**Assessment:**  3 quizzes 40%, final exam 45%, labs 5%, WeBWorK 5%, in-class clicker participation 5%

To pass the course it is normally necessary to obtain 50% based on the quiz and final examinations, i.e., 42.5 or more out of the maximum of 85 points. Otherwise the exam grade is normally reported. If the 50% exam threshold is satisfied, the grade reported is weighted based on all 5 assessment components above.

**Policy regarding missing the final exam:** Students who miss the final exam must report to their Faculty advising office within 72 hours of the missed exam, and must supply supporting documentation. Only your Faculty Advising office can grant deferred standing in a course. You must also notify your instructor prior to (if possible) or immediately after the missed exam. Your instructor will let you know when you are expected to write your deferred exam. Deferred exams will ONLY be provided to students who have applied for and received deferred standing from their Faculty. Please note that if you are granted deferred standing for the Stat 305 final exam in term 1, you will be expected to write your deferred exam with the

term 2 sitting of the course in April. In such a case, make sure that you download the class notes from Canvas immediately, because you will not have access to them after December 31$^{st}$.

**Quizzes**: Quizzes are schedule in class on the following dates: TBA. They will start at the beginning of class, so please make sure you are on time. Quizzes will be based on material from assignments, WeBWorK, lab problems, and lectures, including activities held in lectures. If you would like a quiz question remarked, write a note specifying the question/part and the reason for requesting a review of grading. Attach this to your paper and give it to me or a Teaching Assistant *no later than one week after the papers were returned to students*. There will be no make-up quizzes. If you miss a quiz for a documented valid reason, the weights for the other quizzes and the final will be readjusted to total 85% (the quizzes and final make up 85% of the grading scheme). Valid reasons for missing the quiz are typically acute or changed medical conditions, other emergencies, or an important UBC event. Please note that, as  the quiz dates are known well in advance and are in class time, normally there will be no accommodation for other classes, vacations, social events, business transactions, or similar activities.   Please consult the Academic Concession page of the UBC Vancouver Academic Calendar 2019/20 for UBC policy.

**Examination aids:** A formula sheet can be used at the quizzes and final exam. More details will be provided. Please bring your student ID to the quizzes and final exam.

**Labs**: You will work in teams; its membership will be determined by the lab Teaching Assistant. Your team should sit together during lectures, too, as the team will be called upon to answer questions from time to time. For most labs, a joint report for the team will be handed in at the end. It will be marked.

**Assignments**: There will be approximately weekly online WeBWorK assignments for credit. Traditional questions will also be given approximately weekly. They will NOT be collected or marked. Brief answers will be provided in the course text, and some answer will be taken up in the lab or in class. No other solutions will be provided.
If you cannot get started with a question or are stuck at some point in the solution, please see one of the teaching team during office hours. We are here to help YOU successfully complete the problem; if does not help you if we do the problem for you. See us as often as you need to keep making progress. Working together in groups for these questions is allowed and indeed encouraged.
One purpose of all assignments is to prepare you for the quizzes and final, where similar questions will appear. The traditional questions are not part of assessment but are also an (essential!) aid to learning by doing.

**Computing**: Computing is an integral part of this course, e.g., to compute required probabilities. We will use the R data-analysis environment. The course website has information about how you may also download R to your own computer, data sets and examples, and several online R tutorials, including a "getting started guide". Some of the assigned questions and some labs will involve computing. Familiarity with R will be tested on the quizzes and final examination.

**Outline of topics:** The course will start at the section on moment generating functions in the course notes and then proceed closely following the order in the course notes.