CCBC

Spring 2021

School of Mathematics and Science

Mathematics Department

Introduction to Statistical Methods, MATH 153, Section E71, Course Reference Number (CRN) 20757

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 *Senate Policy #20-12 approved: June 2, 2020*

# **Course Description and Pre-/Co-requisites**

**Description: MATH 153 – Students will develop an understanding of statistical methodology and use of critical judgment in analyzing data sets. Topics include descriptive statistics, introduction to probability, normal and binomial distributions, hypothesis testing, confidence intervals, regression and correlation, chi-square distribution, and ANOVA. A statistical computer package, such as StatCrunch, is introduced as a computational tool and integrated throughout the course.**

**Prerequisite: MATH 082 or sufficient math placement score; and ACLT 052 or ACLT 053 or (ESOL 052 and ESOL 054)**

**Co-requisite:**

# Basic Course Information

* 1. Instructor’s name: Anthony Calise
	2. Instructor's office room number: Essex MASH 212 (Virtual Zoom)

Phone number: 410-215-7694

Email address: acalise2@bcps.org

* 1. Instructor's office hours: The hour after class 12:15-1:15pm
	2. Response time and form of preferred communication: Responses should be within 24 hours if you do not hear back within 24 hours please feel free to forward the message again. (I get many e-mails daily)
	3. Department or school phone number(s): Essex 443-840-1837
	4. Class meeting day(s), time(s), and location(s):

Instruction is offered remotely during the scheduled days and times indicated below (synchronously). A physical presence on-campus is not required. This course must be accessed from any location using a computer with internet access and a camera feature.

Saturdays 8:00am to 12:15pm

Join Zoom Meeting

<https://us02web.zoom.us/j/85043920258?pwd=YVkyRGl3TEZUbjdsbm52azc1QmhHdz09>

Meeting ID: 850 4392 0258

Passcode: qj6RV2

* 1. Statement of student out-of-class work expectations: This is a four-credit/billable hour course offered over 13 weeks. You are expected to spend at least 8.6 hours of work per week outside of class time including reading, course preparation, homework, studying, etc.
	2. Testing center/remote proctoring requirements: Exams must be completed on camera during the scheduled class time.
	3. Materials:

Textbook: Fundamentals of Statistics, 5th edition, by Michael Sullivan III, Pearson publishing company.

This course is part of an inclusive access model called First Day™. This will give you easy access to the required materials for this course at a discounted price of $75. CCBC will bill you at the discounted price as a course charge for this course.

Enter (when prompted) the Pearson code: WMSFST-CLONK-MAGEN-TAPPA-SAINT-TOTES

It is NOT recommended that you Opt-Out, as these materials are required to complete the course. You can choose to Opt-Out on the first day of class, but you will be responsible for purchasing your course materials at the full retail price and access to your materials may be suspended.

For more information and FAQs go to [First DayTM](https://customercare.bncollege.com/hc/en-us/categories/360000142447-First-Day-Inclusive-Access-FAQs).

If you have issues accessing the Opt-Out option, please contact the CCBC bookstore manager, Samantha Howe, showe@ccbcmd.edu.

Software: StatCrunch is used to demonstrate statistical concepts. StatCrunch can be accessed through MyStatLab. If Opting Out of First Day, a stand-alone 6 months access to StatCrunch can be purchased for $15 at [StatCrunch](http://www.statcrunch.com/get-access/).

* 1. Technical Requirements:

To learn in a remote format at CCBC, you will need:

* A reasonable level of computer literacy.
* Regular access to a reliable computer desktop, laptop, netbook, etc.
	+ Mobile devices cannot be used.
	+ Must have a camera feature.
* A stable broadband Internet connection.
* A CCBC email account (free when you enroll).
* Access to Blackboard learning management system.

For the full list of technical requirements, check [CCBC’s Online Learning Technical Requirements](http://www.ccbcmd.edu/Programs-and-Courses/CCBC-Online/Online-Services-Resources/Online-Learning-Technical-Requirements.aspx).

Students must notify the instructor immediately if any technical difficulties occur at any time during the semester AND should also have a plan in place for backup arrangements in such instances.

* 1. Other material related to Basic Course Information: Calculators are required

# Course Goals Overall

* 1. Course objectives as listed on the official Common Course Outline

Upon completion of this course the student will be able to:

1. demonstrate statistical reasoning in everyday life using real world data;
2. select appropriate technology to manage data, explore data, perform inference, and check conditions;
3. describe data with appropriate measures of central tendency and variability;
4. generate and interpret statistical graphs;
5. analyze bivariate data using linear regression;
6. summarize data in a contingency table;
7. identify association among qualitative variables using conditional distribution;
8. compare and contrast research of data from diverse cultural and global populations;
9. construct and interpret probability models for discrete random variables;
10. solve a normal probability distribution application;
11. apply the fundamentals of probability in application;
12. construct and interpret confidence intervals in order to make inferences about parameters;
13. perform hypothesis testing to draw inferences regarding parameters;
14. perform a test of independence using the chi-square distribution;
15. solve problems involving one-way analysis of variance;
16. construct a solution to real world problems using problem methods individually and in teams;
17. examine the mathematical/statistical contributions made by people from diverse cultures locally, globally, and throughout history;
18. identify and critically evaluate the ethical issues at stake in individual and collective decisions;
19. effectively communicate the results of a statistical analysis;
20. apply statistical methods to data from diverse cultural and global populations; and
21. find, evaluate, use, and cite appropriate academic resources when completing written assignments.
	1. Major topics as listed on the official Common Course Outline
22. Review
	1. Organizing data
	2. Descriptive measures
23. Sampling Techniques
24. Managing Grouped Data
25. Probability
	1. Fundamentals and basic concepts
	2. Addition rule
	3. Multiplication rule
	4. Conditional probability
26. Discrete Random Variables
	1. Probability distributions
	2. Expected value and standard deviation
	3. Use and interpret binomial probabilities
	4. Mean and standard deviation of a binomial random variable
27. Normal Distribution
	1. Characteristics of the normal distribution
	2. Use and interpret normal probabilities
28. Sampling Distributions
	1. Central Limit Theorem (CLT)
	2. Mean and standard error
	3. Apply CLT in application
29. Estimates and Confidence Intervals
30. Introduction to the t-distribution
31. Confidence interval for a population mean
32. Confidence interval for a population proportion
33. Hypothesis Testing
	1. Purpose of a hypothesis test
	2. Hypothesis test of a population mean
	3. Hypothesis test of a population proportion
	4. Hypothesis testing for two population proportions and means
34. Regression and Correlation
	1. Scatter plot
	2. Use and interpret the correlation coefficient
	3. Use and interpret the linear regression
	4. Contingency tables and association
35. Chi-Square Distribution: Test of Independence
36. Comparing Three or More Means: One -Way Analysis Of Variance (ANOVA)
	1. Rationale: Statistics is used in a great number of areas such as business, psychology, nursing and medicine, biology, and the social sciences. This course will provide the basics of descriptive and inferential statistics so that students will be more able to read and interpret research articles in the student's field. In addition, the student should be better able to understand statistics as it is used in everyday life and in newspaper and magazine articles.
	2. Other material related to Course Goals: Not Applicable

# Evaluation

* 1. Requirements: You must complete all three exams, both projects and all HW/Quizzes (the lowest grade for the HW/Quiz will be dropped. Everyone must also take the Final Exam.
	2. Instructor's grading policy: The course grade will be determined as follows:

All deadlines and important date reminders are posted on my website at [www.mrcalise.com](http://www.mrcalise.com) Under CCBC Essex Math 153 (VIRTUAL)

| **Course Requirements** | **Weight/Points** |
| --- | --- |
| Tests | 40% |
| Projects | 20% |
| HW/Quizzes | 10% |
| Final Exam | 30% |
| Total | 100 % |

A final course grade will be assigned using the following criteria:

| **Course Average** | **Course Grade** |
| --- | --- |
| At least 90% | A |
| At least 80% and less than 90% | B |
| At least 70% and less than 80% | C |
| At least 60% and less than 70% | D |
| Less than 60% | F |

* 1. Mathematics Department attendance policy:
1. You are expected to attend all scheduled classes.
2. Attendance is critical to student success in college.
3. Satisfactory attendance is defined to be at most six hours of unexcused absences.
4. Documentation of the reason for your absence(s) may be required.
5. The instructor may count each unexcused tardy arrival as an absence and each unexcused early departure as an absence.
	1. Mathematics Department audit policy: Students may change from credit to audit only during the published 50% refund period, as indicated in the CCBC academic calendar. Students who audit are required to attend class, participate in course activities, and complete assignments (except for tests and the final exam) in accordance with instructor guidelines and due dates. For students who do not meet these requirements, the instructor may change their grade from AU to W.
	2. Other material related to Evaluation:

Exams must be submitted on time and cannot be turned in late, Projects lose 10% each day late.

# Course Procedures

* 1. Course-related policies and procedures:

All policies are listed on my website at [www.mrcalise.com](http://www.mrcalise.com)

* 1. College-wide syllabus policies: For college-wide syllabus policies, such as the Code of Conduct for Academic Integrity, Grades and Grading (including FX and progress grades), and the Audit/Withdrawal policies, please go to the MySyllabiPolicies tab on the [myCCBC](https://myccbc.ccbcmd.edu/) page.
	2. College-wide student services: To access information about student services, such as Academic Advising, College and Community Outreach/Success Navigators, and Disability Support Services, students may refer to the Student Support Services link on the [CCBC catalog home page](http://catalog.ccbcmd.edu/index.php).
	3. Contact information for course-related concerns:

Students should first attempt to take concerns to the faculty member. If students are unable to resolve course-related concerns with the instructor, they should contact the Mathematics Coordinator at the Essex Campus: Tejan Tingling at 443-840-2631 or ttingling@ccbcmd.edu

* 1. Course calendar/schedule: See item C.2. above (Evaluation – Instructor’s Grading Policy) for location of due dates for all major assignments.

Refer to the CCBC website for the complete [Academic Calendar and Final Exam schedule](http://www.ccbcmd.edu/Resources-for-Students/Registering-for-Classes/Academic-Calendar.aspx) for the semester.

* 1. Expected end date for access to the course via the Learning Management System:

5/22/2021

* 1. Final Exam: The Final Exam date/time for this course is 5/22/2021 9:00 am – 11:00am
	2. Other material related to Course Procedures: Not Applicable

This syllabus may be changed with notification to the class.

List of Full URLs used in this document**:**

[First DayTM](https://customercare.bncollege.com/hc/en-us/categories/360000142447-First-Day-Inclusive-Access-FAQs)

https://customercare.bncollege.com/hc/en-us/categories/360000142447-First-Day-Inclusive-Access-FAQs

[StatCrunch](http://www.statcrunch.com/get-access/)

 http://www.statcrunch.com/get-access/

[CCBC Online Learning Technical Requirements](http://www.ccbcmd.edu/Programs-and-Courses/CCBC-Online/Online-Services-Resources/Online-Learning-Technical-Requirements.aspx)

http://www.ccbcmd.edu/Programs-and-Courses/CCBC-Online/Online-Services-Resources/Online-Learning-Technical-Requirements.aspx

[CCBC Catalog](http://catalog.ccbcmd.edu/index.php)

http://catalog.ccbcmd.edu/index.php

[myCCBC page](https://myccbc.ccbcmd.edu/)

https://myccbc.ccbcmd.edu/

[CCBC Academic Calendar and Final Exam Schedule](http://www.ccbcmd.edu/Resources-for-Students/Registering-for-Classes/Academic-Calendar.aspx)

http://www.ccbcmd.edu/Resources-for-Students/Registering-for-Classes/Academic-Calendar.aspx

[Mr. Calise’s Math 153 Website](http://www.mrcalise.com/ccbc-essex-math-153-virtual.html)

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