

## Term Information

Effective Term Spring 2021

## General Information

Course Bulletin Listing/Subject Area Statistics  
Fiscal Unit/Academic Org Statistics - D0694  
College/Academic Group Arts and Sciences  
Level/Career Undergraduate  
Course Number/Catalog 3440  
Course Title Statistics in Quality  
Transcript Abbreviation Stat Qual  
Course Description Descriptive statistics; introduction to probability; Bayes theorem; discrete and continuous random variables, expected value, probability distributions; interval estimation for means and proportions; hypotheses tests for means and proportions; least squares regression; one- and two-way anova; control charts; process capability indices.  
Semester Credit Hours/Units Fixed: 3

## Offering Information

Length Of Course 14 Week, 12 Week, 8 Week, 7 Week, 6 Week  
Flexibly Scheduled Course Never  
Does any section of this course have a distance education component? No  
Grading Basis Letter Grade  
Repeatable No  
Course Components Lecture  
Grade Roster Component Lecture  
Credit Available by Exam No  
Admission Condition Course No  
Off Campus Never  
Campus of Offering Lima, Mansfield, Marion, Newark

## Prerequisites and Exclusions

Prerequisites/Corequisites Prereq: Math 1152, 1161.xx, 1172, 1154, 1155, or equiv, or permission of instructor.  
Exclusions Not open to students with credit for 3450, 3450.01, 3450.02, 3460, 3470, 3470.01 and 3470.02  
Electronically Enforced Yes

## Cross-Listings

Cross-Listings

## Subject/CIP Code

Subject/CIP Code 27.0501  
Subsidy Level Baccalaureate Course  
Intended Rank Sophomore, Junior, Senior

## Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

## Course Details

### **Course goals or learning objectives/outcomes**

- Understand basic concepts of probability and statistics, and recognize the importance of statistical ideas.
- Comprehend statistical tools for organization, description and presentation of data.
- Understand the methods needed to collect, analyze and critically evaluate statistical arguments to improve processes.
- Recognize the importance of how to formulate, construct and interpret confidence intervals of the parameters in a statistical model
- Recognize the importance of how to formulate statistical hypotheses about the parameters in a statistical model, construct appropriate hypothesis tests, and interpret the results in both a statistical and practical context
- Learn statistical quality control methods to understand the sources of variations in manufacturing processes

### **Content Topic List**

- Exploratory data analysis
- Probability and probability distributions
- Sampling distribution
- One-sample inference
- Two-sample inference
- Simple linear regression model
- Analysis of variance
- Quality control

### **Sought Concurrence**

No

## Attachments

- OSUSTATS3440BSETSupportLtr.pdf  
*(Cover Letter. Owner: Craigmile, Peter F)*
- STAT3440\_syllabus.docx  
*(Syllabus. Owner: Craigmile, Peter F)*

**Comments**

- Syllabus is more detailed. Response to the comments:

1. Listed the course outcomes to be more visible. Also listed them in ABET format. It is a kind of duplicate, but the regional campus committee wants it to be more visible.

2. Provided Marion Campus information for Disability services, Title IX coordinators, Student services, etc.

3. For the comment “Course outcome C1 is not very apparent in the course. Include some information in syllabus on how designing experiments and observational studies will be present in the activities”.

Changed the lecture 19 topic to “Comparing observational studies and experiment, basic principal of a design of experiment.” The Lab 5 and Assignment 6 will have some questions to re-enforce learning on this topic. *(by*

*Craigmile, Peter F on 09/25/2020 10:44 AM)*

- See NMS Panel feedback sent on 9-14-20 *(by Vankeerbergen, Bernadette Chantal on 09/14/2020 11:34 AM)*

**Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Craigmile, Peter F	07/01/2020 09:44 PM	Submitted for Approval
Approved	Craigmile, Peter F	07/01/2020 09:45 PM	Unit Approval
Approved	Haddad, Deborah Moore	07/02/2020 08:30 AM	College Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	09/14/2020 11:34 AM	ASCCAO Approval
Submitted	Craigmile, Peter F	09/25/2020 11:17 AM	Submitted for Approval
Approved	Craigmile, Peter F	09/25/2020 11:17 AM	Unit Approval
Approved	Haddad, Deborah Moore	09/25/2020 02:14 PM	College Approval
Pending Approval	Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Oldroyd, Shelby Quinn Vankeerbergen, Bernadette Chantal	09/25/2020 02:14 PM	ASCCAO Approval



## THE OHIO STATE UNIVERSITY

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June 30, 2020

Peter F. Craigmile, PhD  
Department of Statistics  
The Ohio State University  
1958 Neil Avenue Columbus, OH 43210 USA

Dear Dr. Craigmile,

On behalf of The Ohio State University Bachelor of Science in Engineering Technology (BSET) program, we are writing to express our strong support for the proposed Statistics 3440: Statistics with Applications in Quality. The BSET program is a new 4-year degree program at Ohio State designed to prepare graduates to effectively transition into manufacturing/production engineering and similar technically based leadership roles in organizations. The goals for graduates of the program include mastery of systems thinking and problem solving, professional skills, business foundations and continuous improvement skills.

Statistics is a foundational course for the BSET program that involves an inquiry-based approach to give students not only the fundamental language and knowledge of statistics calculations, but how to analyze and derive meaning from data. Modern tools (Excel and Minitab) will be used to reduce the time for hand calculations and allow more time for meaning and interpretation. Open-ended problems with data sets can be used to help students learn how to identify which methods to use and what the results mean.

In summary, Statistics 3440 will strengthen the BSET program. We appreciate your thoughtful consideration of this course. Please feel free to contact us through Kathryn Kelley at [kelley.81@osu.edu](mailto:kelley.81@osu.edu) or (614)256-3724.

Sincerely,

Kathryn L. Kelley  
Executive Director  
Ohio Manufacturing Institute  
The Ohio State University

Aimee Ulstad, PE  
Associate Professor  
Integrated Systems Engineering  
College of Engineering

# **SYLLABUS: STAT 3440**

## **STATISTICS IN QUALITY**

### **AUTUMN 2022**

## **Course overview**

### **Instructor**

Instructor: Omer Ozturk

Email address: Ozturk.4@osu.edu

Phone number: 740 725 6204

Office hours: To be determined

Office Location: Morrill Hall 350H

### **Course description**

The course covers descriptive statistics, introduction to probability, Bayes theorem; discrete and continuous random variables, expected value, probability distributions; interval estimation for means and proportions; hypotheses tests for means and proportions; least squares regression; one- and two-way anova; control charts; Process capability indices.

Prerequisite: Math 1152, 1161.xx, 1172, 1154, 1155, or equiv., or permission of instructor. Not open to students with credit for 3450, 3460 and 3470.

### **Course learning outcomes**

By the end of this course, students should successfully be able to:

- Select and construct appropriate display procedures to provide graphical summaries of the data.
- Use appropriate summary statistics to describe the distribution of data.
- Use appropriate statistical terminology to describe data and distributions.
- Use correct procedures for designing experiments and observational studies.
- Compute and interpret the probability of statistical events.
- Match common probability distributions with simple engineering data generating processes.

## Syllabus: *STAT*; 3440

- Model engineering data based on large-sample normal distribution assumptions, and identify when such models are appropriate for given data,
- Use the Central Limit Theorem as the foundation of statistical inference.
- Construct and interpret confidence intervals within the context of engineering problems.
- Conduct and interpret hypothesis tests.
- Build a simple linear regression model and perform diagnostic checks for bivariate data.
- Construct one-way analysis of variance model and identify and interpret the source of variations.
- Select appropriate statistical tools to monitor process quality.
- Compute and interpret capability indices.

*Next are the ABET Criteria which is the Accrediting Board that validates Engineering & Engineering Technology programs are teaching you what you need to know. This course's goals and outcomes align with ABET's student outcomes as shown below.*

ABET Student Outcomes - General Criteria	Course Goals	Course Outcomes
<p>(1) an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problem appropriate to the discipline</p>	<p>A-Understand basic concepts of probability and statistics, and recognize the importance of statistical ideas.</p>	<p>A1- Compute and interpret the probability of statistical events.</p> <p>A2-Match common probability distributions with simple engineering data generating processes.</p> <p>A3-Model engineering data based on large-sample normal distribution assumptions, and identify when such models are appropriate for given data,</p> <p>A4- Construct sampling distributions of sample statistics.</p> <p>A5- Use the Central Limit Theorem as the foundation of statistical inference.</p>

## Syllabus: *STAT*; 3440

<p>(3) an ability to apply written, oral, and graphical communication in broadly defined technical and non-technical environments; and an ability to identify and use appropriate technical literature</p>	<p>B-Comprehend statistical tools for organization, description and presentation of data.</p>	<p>B1-Select and construct appropriate display procedures to provide graphical summaries of the data. B2- Use appropriate summary statistics to describe the distribution of data. B3- Use appropriate statistical terminology to describe data and distributions.</p>
<p>(4) an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes</p>	<p>C:</p> <ol style="list-style-type: none"> <li>1. Understand the methods needed to collect, analyze and critically evaluate statistical arguments to improve processes.</li> <li>2. Recognize the importance of how to formulate, construct and interpret confidence intervals of the parameters in a statistical model.</li> <li>3. Recognize the importance of how to formulate statistical hypotheses about the parameters in a statistical model, construct appropriate hypothesis tests, and interpret the results in both a statistical and practical context.</li> </ol>	<p>C1- Use correct procedures for designing experiments and observational studies.</p> <p>C2- Construct and interpret confidence intervals within the context of engineering problems.</p> <p>C3-Conduct and interpret hypothesis tests.</p> <p>C4- Build a simple linear regression model and perform diagnostic checks for bivariate data.</p> <p>C5- Construct one-way analysis of variance model and identify and interpret the source of variations.</p>
<b>Discipline Specific -SME Outcomes</b>		
<p>(d) knowledge, skills, and abilities in statistics, quality, continuous improvement, and industrial organization and management</p>	<p>D-Learn statistical quality control methods to understand the sources of variations in manufacturing processes</p>	<p>D1-Select appropriate statistical tools to monitor process quality.</p> <p>D2- Compute and interpret capability indices.</p>

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<sup>1</sup> ABET (Accrediting Board of Engineering & Technology) evaluates student learning in 5 categories specifically for all 4-Year BSET programs known as the Student Outcomes 1-5. These are criteria they have determined are required to successfully work in the Engineering Technology field. Criteria 1,3, and 4 will be evaluated in this course.

SME (Society of Manufacturing Engineers) supports ABET in assessing the specific skills students gain in the technical portion of the discipline. Criteria a, c, and d area assessed in this course.

## Course materials

Statistics for Engineers and Scientists, 5<sup>th</sup> edition, By William Navidi  
ISBN10: 1259717607  
ISBN13: 9781259717604

## Course technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours>, and support for urgent issues is available 24x7.

- **Self-Service and Chat support:** <http://ocio.osu.edu/selfservice>
- **Phone:** 614-688-HELP (4357)
- **Email:** [8help@osu.edu](mailto:8help@osu.edu)
- **TDD:** 614-688-8743

## Necessary software

- This class requires you to use the statistical software package called Minitab. If you are interested in using Minitab at home, go to Minitab's website (<http://www.minitab.com>). This software package is available at computer lab at Marion Campus.
- [Microsoft Office 365 ProPlus](#) All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Each student can install Office on five PCs or Macs, five tablets (Windows, iPad® and Android™) and five phones.
  - Students are able to access Word, Excel, PowerPoint, Outlook and other programs, depending on platform. Users will also receive 1 TB of OneDrive for Business storage.
  - Office 365 is installed within your BuckeyeMail account. Full instructions for downloading and installation can be found <https://ocio.osu.edu/kb04733>.

## Course delivery

Lectures will be delivered in-person teaching mode. Instructor may elect to record lectures and publish them in course webpage in Carmen.



# Grading and faculty response

## Grades

Assignment or category	Percentage
Homework	20
Labs	10
Quizzes	15
Midterm	25
Final	30
<b>Total</b>	<b>100</b>

See course schedule, below, for due dates

## Assignment information

There are several homework assignments and lab reports which are due at various times during the semester. The homework will be assigned through course webpage in Carmen.

**Exams:** There will be three quizzes, one midterm exams as well as a two-hour final exam. The final exam will be comprehensive with a slight emphasis on those topics covered later in the semester. Tentative dates of quizzes and exam are listed in the course schedule. One 8.5 x 11 inch sheet of paper (front and back), with whatever facts, formulas, or explanations you find helpful, may be brought to exam. Two sheets of papers may be brought to the final exam.

**Full credit policy:** Full credit for exam problem can only be earned through showing your justification for or work on each problem. Answers without work will **not** receive full credit.

## Late assignments

No make-up exams will be given unless you have made arrangement with the instructor *prior to* the beginning of the exam. No late homework is accepted unless you have a reasonable reason.

## Grading scale

93–100: A  
90–92.9: A-

87–89.9: B+  
83–86.9: B  
80–82.9: B-  
77–79.9: C+  
73–76.9: C  
70–72.9: C-  
67–69.9: D+  
60–66.9: D  
Below 60: E

## Faculty feedback and response time

I am providing the following list to give you an idea of my intended availability throughout the course. (Remember that you can call **614-688-HELP** at any time if you have a technical problem.)

### Grading and feedback

For large weekly assignments, you can generally expect feedback within **7 days**.

### E-mail

I will reply to e-mails within **24 hours on school days**.

### Discussion board

I will check and reply to messages in the discussion boards every **24 hours on school days**.

## Attendance, participation, and discussions

You are responsible for your own learning. The instructor is here solely to facilitate your learning and understanding of the discipline of statistics. The instructor will help you as much he/she can, but learning the material is ultimately up to you. This includes:

- attending class meetings or getting assignments and notes from others if you miss class;
- asking questions when you have them, either in class or out of class;
- doing the assigned homework on time and participating in class; and
- contacting the instructor if you are having difficulties.

## Student participation requirements

Participation is required in this course. The following is a summary of everyone's expected participation:

- **Logging in:** Be sure you are logging in to the course in Carmen each week, including weeks with holidays or weeks with minimal online course activity. (During most weeks you will probably log in many times.) If you have a situation that might cause you to miss an entire week of class, discuss it with the instructor *as soon as possible*.
- **Office hours:** I will be available during my office hours. If you would like to meet me outside of the scheduled office hours, you need to make an appointment.  
Discussion and communication guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style:** While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. Informality (including an occasional emoticon) is fine for non-academic topics.
- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online.
- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. (For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.)
- **Backing up your work:** Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

## Other course policies

### Health and safety

The Ohio State University Wexner Medical Center's Coronavirus Outbreak site (<https://wexnermedical.osu.edu/features/coronavirus>) includes the latest information about COVID-19 as well as guidance for students, faculty and staff.

### University COVID policies

All teaching staff and students are required to comply with University safety and health guidance which includes wearing a face mask in any indoor space and maintaining a safe physical distance at all times. Non-compliance will be warned first and disciplinary actions will be taken for repeated offenses.

## Student illness or absence

The university is committed to supporting students and program participants with COVID-19 based risk factors. The Marion campus will work with students who are vulnerable to complications from COVID-19 to ensure that they have the necessary resources to participate in university life as safely as possible. Ohio State students from any campus may submit a [COVID-related accommodation request](#). Students registered with the Office for Disability Services can work directly with that office to modify their accommodations or make additional COVID-based accommodation requests.

In the event you must quarantine because of exposure to someone diagnosed with COVID-19 OR you are feeling ill with COVID-19 symptoms, you still will be able to make progress in this class. Please contact your instructor right away, as some accommodations may require extra set-up or planning. The quarantine plan for this course is to

-join remotely via Zoom.

-record the class session and post the recording on Carmen.

## Instructor illness or absence

If the *instructor* is quarantined or is experiencing respiratory symptoms but is well enough to teach, the in-person sessions will be moved online to Zoom. You will be notified via email no later than. If the *instructor* is too ill to teach the course for a period of time, the designated backup for this course will step in.

## Campus closure

Should The Ohio State University Main Campus move to full online instruction due to closure, please wait for your instructor to email directions for the next session. Our in-person classes will be moved to Zoom.

## Student academic services

**Media Lab:** Media Lab will be open Monday through Friday from 8:00am to 5:00pm for regular computing and media needs. All the lab users are required to wear facial mask and keep social distancing. If you need in-person help session on certain app or software program, make a request via email and the appointment will be arranged in the Media Lab (MR281) with social distancing and wearing face covering. Media equipment services will be available on the request bases.

For CarmenCanvas and CarmenZoom help call Joe Zhou at 740 725 6385 or Email [zhou.134@osu.edu](mailto:zhou.134@osu.edu). Carmen Zoom help session will be available for Carmen course content design and development questions and issues. Due to the COVID-19 pandemic, most help sessions will be conducted online with Zoom meetings.

For IT Equipment Check Out and Digital Production Studio Reservation visit the following link for instructions: <https://osumarion.osu.edu/faculty-and-staff/staff-services/it-resources.html>

Call Marion Help-Desk at (740) 725–6329 for any technical request and issue on classroom or office computers, iPads, network and Email. You may contact IT technicians directly via Email to Bryan Sickmiller ([sickmiller.2@osu.edu](mailto:sickmiller.2@osu.edu)) and Travis Elkins ([elkins.66@osu.edu](mailto:elkins.66@osu.edu)).

Call 8-HELP (614) 688-4357 for any tech issue when campus technician is not available.

**The Academic Success Center (ASC):** ASC offers tutoring services (at no additional cost to normal tuition) to assist OSU student learning. The physical location of the center is in Morrill Hall 216, however, services will be offered primarily through virtual means this semester (AU 2020). The Center consists of three parts: Math Lab, STEM Center, and Writing Center, that each provide professional tutoring help on a drop-in and appointment basis. Additionally, if you would like to submit a request for assistance in a subject outside these disciplines, please submit an online application for a tutor [here](#). For the most up-to-date information regarding all aspects of the center please visit our website (<https://u.osu.edu/marionasc/>), or email [AcademicSuccess@osu.edu](mailto:AcademicSuccess@osu.edu). Please remember that the Ohio Public Health situation is very fluid and constantly changing, thus your flexibility is much appreciated and will help us to provide you with the most assistance!

The Math Lab (Morrill Hall 216) provides professional math help via Mrs. Mary Ellen Tobin for all courses through Math 1172 and 1000-level Statistics courses. She will be offering both virtual appointments ([tobin.44@osu.edu](mailto:tobin.44@osu.edu)) and in-person walk-in hours following OSU's most up-to-date COVID-19 safety guidelines. Please visit the Math Lab website (<https://u.osu.edu/mathlab/>) for further details and information.

The campus Writing Center offers help with writing at any stage of the writing process for any member of the OSU-Marion and MTC community. During our sessions, we can work with you on any kind of writing, from papers/reports for classes to application materials to workplace documents. All writing consultations this semester will be held virtually through Zoom. Dr. Catherine Braun and Mrs. Amy Tibbals will be hosting Zoom drop-in hours, Zoom appointments, and electronic drop-off appointments. Please visit the Writing Center website (<https://u.osu.edu/marionwc/>) for further details and information.

The STEM Center offers assistance with courses in science and engineering. Dr. Tiffiny Rye-McCurdy will provide assistance with chemistry and biology concepts during Zoom drop-in

## Academic integrity policy

### Policies for this course

- **Quizzes, exams and lab reports:** You must complete the quizzes, midterm and final exams yourself, without any external help or communication.
- **Written assignments:** Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should follow [MLA/APA/?] style to cite the ideas and words of your research sources. You are encouraged to ask a trusted

person to proofread your assignments before you turn them in--but no one else should revise or rewrite your work.

- **Reusing past work:** In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.
- **Falsifying research or results:** All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.
- **Collaboration and informal peer-review:** The course includes many opportunities for formal collaboration with your classmates. While study groups and peer-review of major written projects is encouraged, remember that comparing answers on a quiz or assignment is not permitted. If you're unsure about a particular situation, please feel free just to ask ahead of time.

### Ohio State's academic integrity policy

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

### Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

### Statement on title IX (Recommended)

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race).

For Title IX concerns contact contact Shawn Jackson, Title IX Coordinator ([jackson.368@osu.edu](mailto:jackson.368@osu.edu) or (740)725-6219). To make a confidential report contact the Office of Counseling & Wellness counselors Leslie Beary ([beary.4@osu.edu](mailto:beary.4@osu.edu)) or Ellen Thomas ([thomas.1159@osu.edu](mailto:thomas.1159@osu.edu)) . For more information regarding Title IX concerns refer to <https://titleix.osu.edu/>.

If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Interim Ohio State Title IX Coordinator, Molly Peirano, at [titleix@osu.edu](mailto:titleix@osu.edu)

## **Accessibility accommodations for students with disabilities**

The university strives to make all learning experiences accessible to all students. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, register with the Office for Disability Services at

<https://sierra.accessiblelearning.com/OSU/ApplicationStudent.aspx>.

After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. ODS contact information: [marions@osu.edu](mailto:marions@osu.edu); 740-725-6247; <https://osumarion.osu.edu/academics/academic-support-services/disability-services.html>; 128 Maynard Hall, 1461 Mount Vernon Avenue, Marion.

## **Your mental health**

Services for students are available through telemental health appointments via Zoom. Mental health concerns or stressful events can lead to diminished academic performance or a reduction in the ability to function well. If you or a student you know is struggling with life on or off-campus, help is available by calling (740) 725-6349 or emailing Leslie Beary ([beary.4@osu.edu](mailto:beary.4@osu.edu)). If you are in crisis call 9-1-1. To speak to someone outside of normal office hours, students can reach the OSU After-Hours Line at (614) 292-5766. Help is also available through the National Suicide Prevention Lifeline

Hotline at 1-800-273- TALK or at [suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)

## **Disclaimer**

This syllabus should be taken as a fairly reliable guide for the course content. However, you cannot claim any rights from it and in particular we reserve the right to change due dates or the methods of grading and/or assessment if necessary. Any changes will be communicated to you through official course announcements.

## Course schedule (tentative)

Week	Lecture	Topics	Assignment
1	1	Overview of the course and brief review of the syllabus, observational studies, experiment, simple random sample, Histogram and box plot, shape of the data, location measure, mean, median and mode	Assignment 1, Due date is at the end of the second week
1	2	Measures of spread, standard deviation, IQR, empirical rule, outliers.	
2	3	Lab1, exploratory data analysis.	Lab1 report, descriptive statistics
2	4	Basic set operation, union, intersection, complement events. Probability axioms and rules	Assignment 2, Due date is at the end of the 4th week.
3	5	Conditional probabilities, Bayes theorem, independent events	
3	6	Discrete random variable, probability mass function, Expected Value, Standard Deviation	
4	7	Binomial Distribution	Assignment 3, Due date is at the end of the 5th week
4	8	Poisson Distribution, Lab2, acceptance sampling design	Lab2 report, acceptance sampling
5	9	Normal distribution	Quiz 1
5	10	Exponential distribution, review for midterm	
6	11	Midterm exam	
6	12	Central limit theorem, sampling distribution of mean and proportion Lab3, normal distribution	Assignment 4, Due date is at the end of 7 <sup>th</sup> week, Lab3 report
7	13	Confidence interval for mean	
7	14	Confidence interval for proportion	
8		No classes	
8	15	Hypothesis testing for mean	Assignment 5, Due date is at the end of the 10 <sup>th</sup> week
9	16	Hypotheses testing for proportion.	
9	17	Two-sample problem for mean	Quiz 2
10	18	Two-sample problem for proportion Lab 4, Two sample inference	Lab4 report, Two sample inference



10	19	Comparing observational studies and experiment, basic principals of a design of experiment.	Assignment 6, Due date is at the end of the 11 <sup>th</sup> week
11	20	Anova, Lab5	Lab 5 report, design of experiment, Anova
11	21	Correlation	Homework 7, due date is at the end of the 12 <sup>th</sup> week
12	22	Simple linear regression model	
12	23	Control charts	Homework 8, Due date is at the end of the 15 <sup>th</sup> week
13	24	Control charts	
13		No classes	
14	25	Process capability indices, Cp	
14	26	Process capability indices, Cpk	Quiz 3
15	27	Lab 6, Process capability indices, Cpk, Review for final	Lab 6 report