



THE OHIO STATE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES

WELCOME TO: STAT 3470

INTRODUCTION TO PROBABILITY AND STATISTICS FOR ENGINEERS

Spring 2024

Course overview

Instructor & Office Hours

Instructor: Dr. Sanjeevani Weerasingha

Email address: weerasingha.1@osu.edu

Office Hours (in-person): Monday and Wednesday 11:00 AM – 12:00 PM, or by appointment.

Office Location: Cockins 205C

Office Hours (online Zoom): Tuesday and Thursday 9:00 AM – 10:00 AM

Class Meetings Days/Times

Class will meet Monday, Wednesday, and Friday 9:10 AM – 10:05 AM in 209 W 18th Ave 160.

Teaching Assistant

Teaching Assistant: Rezoanoor Rahman

Email: Rahman.282@osu.edu

Office hours: TBD

Course Description

This 3-credit hour course is an introduction to probability and statistics for engineers. Topics covered include probability, Bayes Theorem, discrete and continuous random variables, probability distributions, expected values, sampling distributions, point estimation, confidence intervals, hypothesis testing and least squares regression models. A more detailed list of topics can be found in the tentative schedule below.

Your Support System

Lecturer	Provide the overarching view of the clusters of concepts.
Office Hours	Conducted in in-person and one large Zoom room, but you can email me if you need to speak with me privately.

Primary Course Goal:

This course satisfies the General Education foundation requirement in Mathematical and Quantitative Reasoning or Data Analysis which has the following goals and expected learning outcomes:

Goals: Successful students will be able to apply quantitative or logical reasoning and/or mathematical/statistical methods to understand and solve problems and will be able to communicate their results.

Course Objectives:

- To enable you to use statistical tools for presentation and descriptions of data.
- To enable you to correctly apply probability rules and counting techniques.
- To enable you to understand the use of sampling distributions as the foundation of inference.
- To enable you to analyze data through linear regression, confidence intervals, and hypothesis tests.

Expected learning outcomes (ELOs)

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

- Use logical, mathematical and/or statistical concepts and methods to represent real-world situations.
- Use diverse logical, mathematical and/or statistical approaches, technologies and tools to communicate about data symbolically, visually, numerically and verbally.
- Draw appropriate inference from data based on quantitative analysis and/or logical reasoning.
- Make and evaluate important assumptions in estimation, modeling, logical argumentation and/or data analysis.
- Evaluate social and ethical implication in mathematical and quantitative reasoning.

Course delivery

Lectures will be delivered in person during the scheduled class meeting times.

Students are expected to attend and participate in these in-person class meetings. Class meetings will be used to provide in-depth investigation of the topics for the week using a lecture format. Students will participate in these class sessions by engaging in discussions prompted by the instructor and by asking and answering questions. Students should plan to take notes during class.

Course materials

Required Course Materials

- *Probability and Statistics for Engineering and the Sciences*(9th edition), by Jay Devore and access to the accompanying homework management system WebAssign.

The electronic version of this textbook and WebAssign are offered through CarmenBooks. The eBook, and homework assignments are all located within this resource.

<https://affordablelearning.osu.edu/carmenbooks/students> Instructions for accessing this course's WebAssign page will be posted on Carmen. The course instructors and graders will have access to data collected by WebAssign, including all recorded homework solution attempts.

Carmen

This class will use Carmen. In Carmen, you will find copies of the syllabus, homework assignments, lecture notes and other important documents. Carmen will also be used to keep track of your assignment grades. Additionally, materials for lectures will be uploaded to the Carmen.

Online Materials

- Instructions, materials, assignments, announcements, and other information will be posted to the course Carmen site.
- Students are asked to use the Carmen discussion boards to ask questions or discuss topics relevant to this course. These will not be graded.
- There will be a discussion board dedicated to each homework assignment. Students are encouraged to answer each other's questions and read the questions in the board before posting a new one in case their question has already been answered.
- Students are expected to check the Carmen course site regularly, and are encouraged to customize Carmen notifications to stay abreast of course announcements and activities. (<https://resourcecenter.odee.osu.edu/carmencanvas/setting-notification-preferences>).
- In particular, important communication in the course will be done through Carmen announcements. Students are responsible for any information that is included in the announcements, so they are expected to read those fully.

Optional Materials

- Texas Instruments 83 Plus (or higher) Graphing Calculator.
- University provided iPad.

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
- **TDD:** 614-688-8743

Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Visit the [installing Office 365](https://go.osu.edu/office365help) (go.osu.edu/office365help) help article for full instructions.

Technology Skills Needed for This Course

- Basic computer and web-browsing skills.
- If you need technical assistance, either call 614-688-HELP, or refer to the online instructions: <https://resourcecenter.odee.osu.edu/carmenzoom>
- Navigating Carmen; the following website may help you if you encounter difficulties with Carmen: <https://resourcecenter.odee.osu.edu/canvas/>.
- Navigating WebAssign; the following website may help you if you encounter difficulties with WebAssign: <http://support.cengage.com/>. Only Cengage support personnel can assist you with linking your WebAssign account to the WebAssign course.
- Navigating Carmen quizzes.

Required Equipment

- **Computer:** current Mac (MacOS) or PC (Windows 10) with high-speed internet connection
- **Webcam:** built-in or external webcam, fully installed (if virtual office hours)
- **Microphone:** built-in laptop or tablet mic or external microphone(if virtual office hours)
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If you do not have access to the technology, review options for technology and internet access at go.osu.edu/student-tech-access.

Grading

Assignment or category	Percentage
Homework Assignments	20%
Quizzes	15%
Mid-term: Exam 1	20%
Mid-term: Exam 2	20%
Final Exam	25%
Total	100

Assignments Information

Homework Assignments:

There are 8 homework assignments that you will complete during the semester.

Students must submit solutions to these assignments online, through the WebAssign interface. If you answer a question part correctly on the number specified attempts (Ex: on the first 3 attempts), you get full credit. You can keep answering after that (up to 100 attempts) but you will receive no credit for answers beyond the specified attempts (Ex: 3 attempts). However, this may be useful if later parts of the problem depend on that part.

Students are encouraged to seek help from the discussion boards and instructor office hours for these problems. Students are allowed to use any type of material to help with understanding concepts but are not allowed to search for solutions to the specific problems on the assignment.

Please read the instructions on Webassign for each homework set carefully, as there are sometimes problems you are told to skip or given hints for.

Links to homework assignments can be found within the weekly modules or by going to the **Assignments** link on the left side of the CarmenCanvas course page. You may use any materials you want to complete the homework. We encourage you to work on your own to get the most learning possible.

Any question about homework should be directed to the Teaching assistant for this class. But, if your question requires significant back-and-forth communication, the Teaching assistant may ask you to make an appointment or attend office hours, especially if your question isn't easily answerable over email. Therefore, please do not wait until the last moment to begin working on assignment, so that we can help in a timely manner.

Quiz Assignments:

There are two types of quiz assignments.

Take-home Quizzes:

There are 4 take home Quiz assignments that you will complete during the semester. You will be given 48 hours to complete take-home quizzes with two attempts. You can find the tentative due dates for these take -home quiz assignments in our tentative schedule (at the end of this document).

In class Quizzes:

There are 8 in-class quiz assignments that you will complete during the semester. In-class quizzes are unannounced and will be assigned on a regular basis to be submitted at the end of the class. Students must submit solution to these in-class quizzes through Carmen.

Each Quiz assignment is worth 10 points. Links to Quiz assignments can be found on Carmen Site or by going to the **Quizzes** link on the left side of the CarmenCanvas course page. You may use any materials you want to complete the Quizzes.

At the end of the semester, **the four lowest quiz grades will be dropped.**

Late work is not accepted unless there are extenuating long-term circumstances that are documented. The lowest 4 quiz assignments are dropped to cover all work that is not turned in for any other reason.

Please note that attendance is mandatory for submitting in-class quizzes. If you fail to attend the lecture session, you will not be able to get credit for your submission of in-class quiz activity.

We DO NOT make up missed quizzes, nor do we excuse them. Save your drops for when you absolutely need them.

In general, late submissions are not accepted for quizzes. However, in case of emergency with proper documentation, you may contact the instructor (Dr. Weerasingha) to discuss makeup work.

Important:

- **For both homework and quizzes**, please be very careful about your rounding.
- Always round to the exact number of decimal places asked for.
- If there are intermediate steps in a problem, please hold several decimal places beyond those required for the final answer if you need to round intermediate steps.
- Please use SALT or other technology for more precision rather than statistical tables.
- Failure to do these things may cause you to lose points even if your method was correct. If you followed these steps and still got an answer wrong due to rounding discrepancies, feel free to contact your instructor.

Exam Information and Policies

There will be two midterm exams and one final exam. Exams are in person on paper. No extra materials are to be used on the exam. Exam questions contain multiple choice questions and may contain short answer questions. The exams are closed book. Calculators will be allowed on the exam as long as they cannot connect to the internet. Please note that solutions, not answers, will be graded; a correct answer alone will not get full credit if the steps leading to it are not clear and/or correct.

An online practice exam will be posted for each exam. You **MUST HAVE** your Buck-ID available to

show the proctor during the exam. If you missed the exam for any unexcused reason, you might not be allowed to make it up and may receive a zero. If you are allowed to take a make-up, you may receive a penalty of up to 25% of the total points. Any missed exams with no communication to us within 24 hours (except for extreme emergencies) may receive a 0.

If you have a documented class conflict, there will be a make-up exam scheduled. If you have an emergency or extended illness and are going to miss an exam, please notify Dr. Weerasingha as soon as possible so arrangements can be made. Please also have documentation (doctor's note, etc.) that says you were too sick to take the exam (not just that you visited the doctor). Your documentation must be approved prior to your being allowed to take a make-up.

Late Assignments

It is important for you to keep up with the work in this course, both for your own stress levels, and so that we can all be on the same page when we're discussing material.

Late assignments Homework will be accepted for 24 hours after the original due date with a 5% deduction per day. After this, no late assignments will be accepted. Do not wait until the last moment to begin working on assignments. Generally, late Quiz assignments are not accepted. Please plan your time so that you can complete assignments far enough in advance to avoid any last-minute problems. If exceptional circumstances (sudden onset of illness, unexpected family situations, etc.) arise, contact the instructor (Dr. Weerasingha) to discuss the possibility of an extension.

Grade Disputes

It is extremely important that you **pay attention to your grades on a regular basis**. If you feel that an assignment has been graded incorrectly or unfairly, you must speak with Dr. Weerasingha, within **one week** of getting your grade on that assignment. **We will not re-grade assignments at the end of the semester or offer any extra credit if you are not satisfied at that time with your final course grade, especially since you will have known all semester what is expected of you to earn your desired grade in this course.**

We believe strongly that grades are earned, not given. If you need to achieve a certain grade in this course, be careful to complete all assignments, plan appropriate time for studying, come to office hours/tutor room and ask questions, review feedback you receive on graded activities so you can talk to us about any problems you missed, and get help as needed in order to achieve your goal. **We hope your grade in the course will be just as important to you on Day 1 as it is at the end of the semester, especially since you will have known the expectations of this course all semester and are in control of deciding what grade to earn.** We do not bump grades at the end of the semester, we do not have extra credit and we cannot change grades based on a person's circumstances. Do not expect your exams to be curved; they may or may not depending on how the class does. We do not curve the final total points at the end.

IMPORTANT! Keep track of your grades!!

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

Instructor feedback and response time

Grading and feedback

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

Exam, Homework, and quizzes grading questions should be directed to Dr. Weerasingha.

If you find a discrepancy in the grades of homework, quiz, and midterm exam, then you must bring it to Dr. Weerasingha attention no later than one week from the day the scores are in Carmen. After that grades will typically not be changed.

E-mail

Email messages sent to your lecture instructor; teaching assistant should be responded to within 48 hours on weekdays.

Specific technical questions about the course material that require significant back-and-forth communication are not well suited for e-mail; while we will do our best to answer such questions, we may ask that you attend office hours if your question isn't easily answerable over email.

In order to protect your privacy, all course email correspondence must be done through a valid OSU Lastname.number or Buckeyemail account, or through the course website (Carmen Canvas). If you send an email message and get no reply within 48 hours, please send that message again.

Additionally, please include the course number and class start time (e.g. STAT 3470, 8am) in the subject line for all email communication in this class.

Attendance, participation, and discussions

Student participation requirements

We expect you to be actively engaged in the learning process. You are responsible for your learning. Successful students perform a variety of positive academic behaviors like reviewing the Carmen page, downloading notes, being proactive in contacting a TA or classmate as necessary, etc. Schedule a minimum of 6 hours to prepare for this course. This equates to 9 hours weekly when the 3 hours for lecture. Please seek assistance in managing any non-academic responsibilities prior to any potential for under-performance. Please also take advantage of optional opportunities to meet with me and/or the TAs during office hours. We're here to help!

The following is a summary of everyone's expected participation:

- **Attending in-person class meetings: THREE TIMES PER WEEK**
Students are expected to attend and participate in the in-person class meetings.
- **Logging in: AT LEAST ONCE PER WEEK**
Be sure you are logging in to the course in Carmen each week, including weeks with holidays. You will need to log in to Carmen to complete quizzes, view lecture content and upload homework assignments. (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 me *as soon as possible*.
- **Office hours:**
You are encouraged to attend office hours for assistance. If you need to speak with the instructor privately about a topic that cannot be easily discussed during office hours, please contact Dr. Weerasingha to schedule a time to meet.

Electronic Devices

As a courtesy to fellow classmates, all cellular phones and other electronic devices must be silenced during lectures.

Discussion and communication guidelines

Above all, please remember to be respectful and thoughtful in your communications in class and electronically. Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably.

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. A more conversational tone 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. I will provide specific guidance for discussions on controversial or personal topics.
- **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.

Academic integrity policy

A guiding principle is that, if you are considering doing something that might be unethical, then “**Don't do it!!**” This mantra applies to both academic and non-academic settings.

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/>.

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct. <http://studentlife.osu.edu/csc/>.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University. In short, if you are considering doing something that might be unethical, then resist and refrain from pursuing it. This will help you in college and well-beyond.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me. Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages ([COAM Home](#))
- Ten Suggestions for Preserving Academic Integrity ([Ten Suggestions](#))
- Eight Cardinal Rules of Academic Integrity (www.northwestern.edu/uacc/8cards.htm)

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. **Online reporting form** at equity.osu.edu,
2. Call 614-247-5838 or TTY 614-688-8605,
3. **Or email** equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any

human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, [on-demand mental health resources](https://go.osu.edu/ccsondemand) (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is closed at [614- 292-5766](tel:614-292-5766). **24-hour emergency help** is available through the [National Suicide Prevention Lifeline website](https://suicidepreventionlifeline.org) (suicidepreventionlifeline.org) or by calling [1-800-273-8255\(TALK\)](tel:1-800-273-8255). The [Ohio State Wellness app](https://go.osu.edu/wellnessapp) (go.osu.edu/wellnessapp) is also a great resource.

Accessibility Accommodations for Students with Disabilities

Requesting Accommodations

The university strives to maintain a healthy and accessible environment to support student learning in and out of the classroom. 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, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

If you are isolating while waiting for a COVID-19 test result, please let me know immediately. Those testing positive for COVID-19 should refer to the Safe and Healthy Buckeyes site for resources. Beyond five days of the required COVID-19 isolation period, I may rely on Student Life Disability Services to establish further reasonable accommodations. You can connect with them at slds@osu.edu; [614-292-3307](tel:614-292-3307); or slds.osu.edu.

Disability Services Contact Information

Phone: [614-292-3307](tel:614-292-3307) Website: slds.osu.edu Email: slds@osu.edu

In person: [Baker Hall 098, 113 W. 12th Avenue](#)

Accessibility of Course Technology

This course requires use of CarmenCanvas (Ohio State's learning management system) and other multimedia tools. If you need additional services to use these technologies, please request accommodations as early as possible.

- [CarmenCanvas accessibility](https://go.osu.edu/canvas-accessibility) (go.osu.edu/canvas-accessibility)

Religious Accommodations

Our policy to reasonably accommodate the sincerely held religious beliefs and practices of all students. The policy permits a student to be absent for up to three days each academic semester for reasons of faith or religious or spiritual belief.

Students planning to use religious beliefs or practices accommodations for course requirements must inform the instructor in writing no later than 14 days after the course begins. The instructor is then responsible for scheduling an alternative time and date for the course requirement, which may be before or after the original time and date of the course requirement. This alternative accommodation will remain confidential. It is the student's responsibility to ensure that all course assignments are completed.

For more information about religious accommodations at Ohio State, visit odi.osu.edu/religious-accommodations.

Weather or other short-term closing

Should in-person classes be canceled, I will notify you as to which alternative methods of teaching (Ex: meet virtually via CarmenZoom) will be offered to ensure continuity of instruction for this class. Communication will be via Announcements on CarmenCanvas.

Disclaimer

This syllabus should be taken as a fairly reliable guide for the course content. However, 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

The following tentative course schedule is subject to change.

Mondays	Wednesdays	Fridays
January 08 Sample spaces and events	January 10 Axioms and properties of probability	January 12 Counting techniques Conditional probability-
January 15 No class	January 17 Law of total probability Independence	January 19 Discrete Random Variable (RV) Homework 1 Due
January 22 Probability distribution-discrete Take-home Quiz 1 Due	January 24 Expectation and variance-discrete RV	January 26 Binomial distribution
January 29 Poisson and Negative binomial distributions	January 31 Continuous random variables- density and distribution functions Homework 2 Due	February 02 Percentiles and expected values-continuous RV
February 05 Normal distribution	February 07 Exponential, Gamma distributions	February 09 Joint probability distributions Homework 3 Due
February 12 Conditional distributions, conditional expectation	February 14 Exam 1	February 16 Covariance and correlation
February 19 Sampling distribution of a statistic	February 21 distribution of the sample means and central limit theorem.	February 23 concepts of estimation and inference Homework 4 Due
February 26 Point Estimation	February 28 Method of moments-point estimation Take-home Quiz 2 Due	March 01 Maximum likelihood-point estimation
March 04 Confidence Intervals	March 06 Large sample intervals for means. Homework 5 Due	March 08 Large sample intervals for proportions.
March 11 Spring Break	March 13 Spring Break	March 15 Spring Break
March 18 Confidence intervals for means of normal populations. Take-home Quiz 3 Due	March 20 Hypothesis testing procedure.	March 22 Hypothesis testing procedure-population mean Homework 6 Due
March 25 Hypothesis testing-population proportion	March 27 Exam 2	March 29 p-value approach

April 01 Simple linear regression (SLR)- intro	April 03 SLR-estimation	April 05 SLR-Inference Homework 7 Due
April 08 SLR-model checking Take-home Quiz 4 Due	April 10 SLR-transformations	April 12 SLR -prediction
April 15 Multiple regression	April 17 Multiple regression - continue. Homework 8 Due	April 19 Multiple regression - continue.
April 22 Goodness of fit tests	Thursday, April 25 Final Exam 6:00 pm – 7:45 pm in McPherson 1000	

Textbook Reading:

Topic	Textbook Reading
Sample spaces and events, axioms and properties of probability, counting techniques, conditional probability	1.1-1.4, 2.1-2.4
Bayes' theorem and independence, discrete random variables, probability distributions, expectation and variance of (functions of) random variables	2.5, 3.1-3.3
Binomial, Poisson probability distributions	3.4, 3.6
Continuous random variables, density and distribution functions, percentiles and expected values, the Normal distribution	4.1-4.3
Exponential, Gamma distributions, joint probability distributions, conditional distributions, conditional expectation, covariance and correlation	4.4, 5.1-5.2
Sampling distribution of a statistic, distribution of the sample mean and central limit theorem	5.3-5.5
Populations parameters, samples statistics, concepts of estimation and inference	6.1
Point estimation, including method of moments and maximum likelihood	6.2
Confidence intervals, large sample intervals for means and proportions	7.1-7.2
Confidence intervals for means of normal populations, hypotheses and testing procedures	7.3, 8.1
Hypothesis testing, tests for population means and proportions	8.2-8.4
Simple linear regression	12.1-12.2
Simple linear regression, estimation and inference	12.3-12.4
Simple linear regression, model checking, transformations	13.1-13.2
Multiple regression, goodness of fit tests	13.4, 14.1