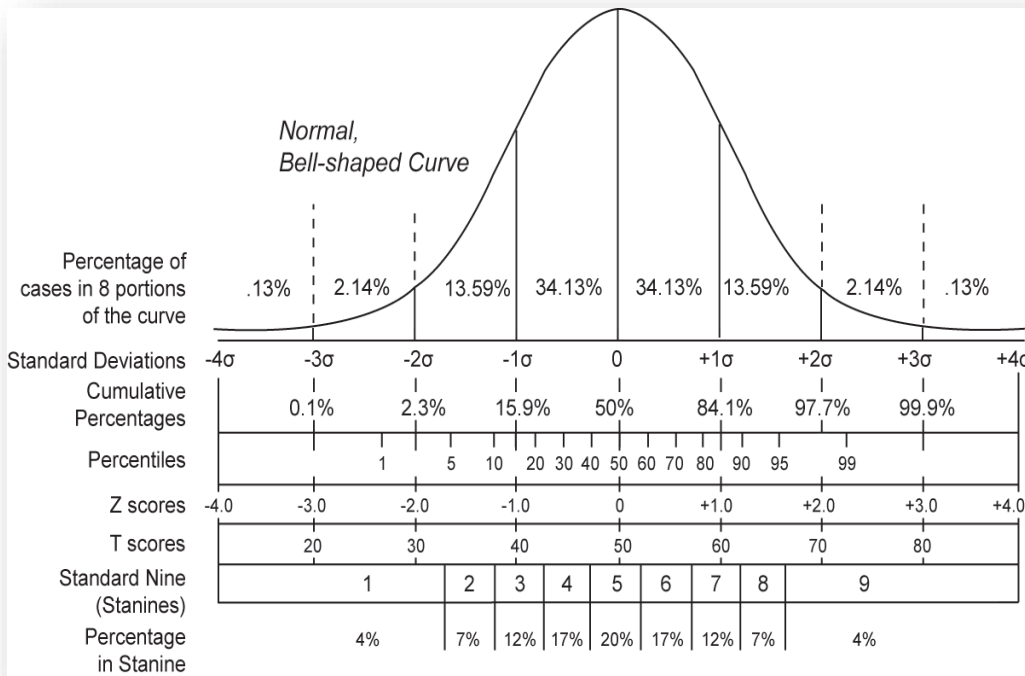


Syllabus

CRN: 20394
 Proctored Exams: 2+1=3
 ORD: ____ 2017
 Drop Day: ____ 2017



Elementary Statistical Methods - Math 1342.W1 | Matt.Wiley@VictoriaCollege.edu

What is Statistics?

Well, at its heart, critical thinking, real world problem solving, future prediction, analysis, odds or probability, and deep thought all join together with some useful mathematical equations and ideas to create a reasonable way to understand our world. We take data (usually lists of numbers that measure something interesting), and we use that (often limited) data to better understand the big picture. Once we understand, we then communicate our answers to other people.

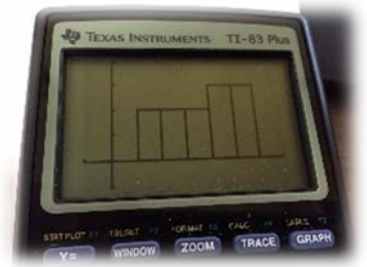
We may measure only weight and blood pressure, and use those to understand more about health. We measure education and wealth, and use those to predict presidential election results. I can measure early quiz and homework scores to predict final course grades. I use it even more deeply to ask a few homework, quiz, essay, and exam questions, and I use it to try to understand how much deeper learning has occurred!

Statistics is deeply tied to a very awesome new area of learning, knowledge, and ability called [Data Science](#). It combines information about purchasing habits from Amazon with essay analytics from Facebook to produce credit scores. Data Science is why your credit card might well be stopped if you buy petrol from a new station, and data science is behind many new pharmaceuticals that save lives.

If we give mice experimental drugs, how many mice perish from the drug, and how many do we expect to perish by chance? Do vaccines cause autism, or are we just getting better at detecting autism? Does it make sense to say “we’re past due for a hurricane?” Do deaths really “come in threes?” How much should you pay for your new car? If we don’t vaccinate all children, are we risking innocent lives?

These are some of the questions statistics asks, and in today’s modern

world of Internet connectivity, the new challenge is not so much what to do with small amounts of information. Rather, we learn with small amounts of information to build up to the ability to cope with the vast oceans of data that require enormous computational power.



My hope for you in our course is to develop a mental framework that will allow you to understand the world around you more clearly and be able to successfully communicate that truer reality to the people around you.

What is this course?

Course Description

Collection, analysis, presentation and interpretation of data, and probability. Analysis includes descriptive statistics, correlation and regression, confidence intervals and hypothesis testing. Use of appropriate technology is recommended. **Prerequisite: Texas Success Initiative complete in mathematics.**

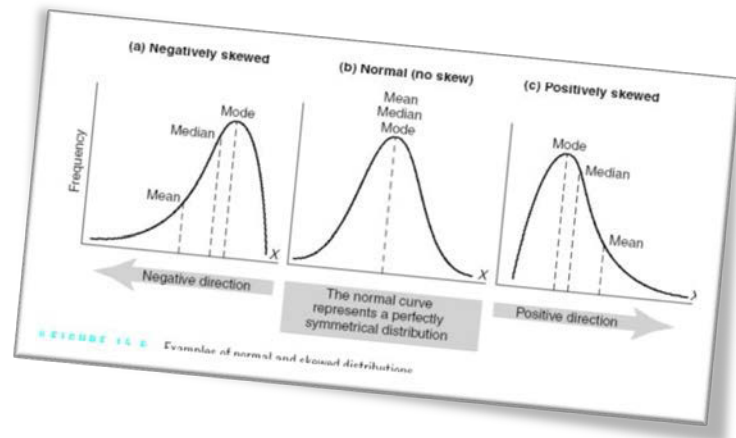
Tips for Success

- Budget *at least* 30 hours a week.
- Read sections and solve Try-Its.
- Review HW & Quiz keys.
- Ask Questions!
- <http://mattwiley.org/courses/Statistics.php>
- Use the Discussion Board.

Course Learning Outcomes

Upon successful completion of this course, students will:

1. Explain the use of data collection and statistics as tools to reach reasonable conclusions.
2. Recognize, examine and interpret the basic principles of describing and presenting data.
3. Compute and interpret empirical and theoretical probabilities using the rules of probabilities and combinatorics.
4. Explain the role of probability in statistics.
5. Examine, analyze and compare various sampling distributions for both discrete and continuous random variables.
6. Describe and compute confidence intervals.
7. Solve linear regression and correlation problems.
8. Perform hypothesis testing using statistical methods.



Program Level Outcomes

1. Apply appropriate mathematical methods (e.g. arithmetic, algebraic, geometric, or statistical methods) to model and solve real-world situations; when appropriate, use technology. To represent and evaluate basic mathematical information verbally, numerically, graphically, and symbolically.
2. Represent and evaluate basic mathematical information in written forms (e.g. numerically, graphically, or symbolically).
3. Use mathematical reasoning skills by interpreting mathematical models (e.g. formulas, graphs, tables, or illustrations) and draw inferences to develop convincing mathematical arguments.

Core Objectives

1. Critical Thinking Skills: to include creative thinking, innovation, inquiry, and analysis, evaluation, and synthesis of information.
2. Communication Skills: to include effective written, oral, and visual communication.
3. Empirical and Quantitative Skills: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.

How Do Grades Work?

| Needed | Possible |
|----------------------|---------------------|
| A 900+ points | Homework: 100 |
| B 800+ points | Quizzes: 200 |
| C 700+ points | Exams: 100+100 |
| D 600+ points | Final Exam: 300 |
| F 0+ points | Project: 100 |
| | Learning: 100 |
| | Explorations: 50 |
| | Timed Skills: 25+25 |

Textbooks, Supplies, & Materials

Our textbook is free and you should download it now!



Textbook: [Introductory Statistics](https://openstaxcollege.org/textbooks/introductory-statistics), by OpenStax and Barbara Illowsky & Susan Dean. The textbook is free and available online at <https://openstaxcollege.org/textbooks/introductory-statistics> ("Get this book" link on the right).

WebAssign Access: An access code to WebAssign is required. You may buy this online at www.webassign.net or in the VC Bookstore. Our [Class Key](#) is ____ (see Canvas).

Calculator: A TI 83/84 (any version) is required for our exams. I am readily able to answer questions about Microsoft Excel, R/RStudio, TI 36X (all versions), TI 83 (all versions), and TI 84 (all versions). Our textbook uses a TI 83 or 84. It is your responsibility to gain my prior approval for any other calculator.

Computer: Many aspects of this course including most if not all graded work may be posted online. Victoria College offers internet access in various labs throughout campus, as well as the VC/UHV Library. Victoria College has a Bring Your Own Device (BYOD) policy. You must have a computer or access to one that meets a minimum setup standard. You may use the computers on campus, but be aware the labs have limited, scheduled hours: www.victoriacollege.edu/computerlab/hours



Course Policies & Expectations

Attendance

Counting as present requires participating in the class when attendance is taken.

Online: You must attempt quizzes; please note quizzes require at least a 70% score earned on linked homework assignments.

Face-to-Face: Either roll call, visual inspection, sign-in sheet, 'clicker' use, assignment submission, or other reasonable measures.

ITV: The above or proctor-methods.

Dropping

Students may drop the course at any time before 65% of the course has been completed for a grade of Q or W. Students with class average below D

may be dropped from the course if absences exceed 20% of the scheduled class meetings. Students with class average below D will be dropped from the course when absences exceed 40% of the scheduled class meetings unless said excessive absences accrue after the 65% drop date. Regular and prompt class attendance is expected of every student. Students who miss class are responsible for all material discussed and any assignments or announcements made that relate to the course. Emergencies should be communicated to the instructor as soon as possible.

Assignments

My goal is assignments give you the practice and feedback you need to master statistics. Always feel comfortable asking questions.

I do not accept late work; I have good reasons.

More points are possible than needed to earn an 'A'. Work all assignments! Students rarely earn perfect scores on any single assignment. Always earn as many points as possible!

Working together is acceptable on homework and other online, outside-of-class, off-campus assignments. Learning with open books, notes, Google, or friends is normal. It is not safe to neglect your own personal mastery of statistics. Assignments should support developing, practicing, and measuring your own deeper learning. Always ask: "How well do I understand these topics?" "Am I ready for exams?" "Am I ready for life?"

Exams are closed book, closed notes, closed friend, closed Google, etc. I want to help you have abilities that are yours forever. To support that, I build exams closed.

Missed exams may be 'made up' with a valid proof (e.g. doctor's note or obituary) by scheduling to take the appropriate 'Timed Skill' proctored by me. Warning: you must not have already taken the Timed Skill, must have proof of extraordinary reason, and find time in my rather busy schedule.

Class Behaviours & Procedures

You should actively participate in class; some forums may be asynchronous.

On discussion boards, discussing ideas is perfectly acceptable and indeed expected and hoped. Provided detailed, step-by-step solutions (aka spoilers) that destroy other students' ability to master material through self-determination is grounds for comment deletion and a zero mark.

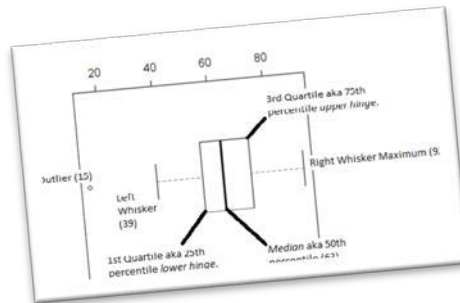
You should fully read all current textbook sections and master in-text examples by working through them line by line with appropriate technology (e.g. pencil or calculator). Ask questions as needed!

Website(s) & email should be checked frequently for important information.

Please use proper grammar, spelling, and social niceties when communicating via writing.

Communicate with me regularly to ensure your experience is the best possible!

Get ahead when possible. Network disruptions are a way of life on the internet, and connection glitches interfere with assignments and quizzes. Sometimes, the Internet may eat your assignment; that is one reason you have 1,100 earnable points in this course and only need 900.



It is natural to feel stress, either about our course or other events in your life. For course related stress, please visit me in my office.

I believe in empowering my students to be self-sufficient learners. I will always be willing to help you; yet I control neither you nor your life. You must read, engage, practice, and learn. I may be able to mentor you through this course. In the end, you must master statistics. You must believe in yourself enough to launch into learning full throttle. Your goal isn't to "just get by." Your goal is to snatch the pebble from my hand. One day you will; I believe in you.

Civility

Respect is the rule: respect yourself, your instructor, and your classmates. A student behaving in a way I deem disruptive will be asked to stop, may be referred to the Vice-President of Student Services for counselling, and may be dropped if such behaviour persists.

Class is what we all choose to make it. I find most folks prefer a positive attitude. I call this purposeful politeness.

"Be kind, for everyone you meet is fighting a hard battle." - Ian Maclaren

Mathematics is difficult, and many students work long hours. Your intrepid instructor works long hours too, and emails sent late into the night after a long day may seem terse and abrupt when secretly both parties are simply tired. I've found smiling as I read emails helps me think that the sender is happy and just trying to find solutions that are legal and sane.

Disability Access

The Americans with Disabilities Act is a federal antidiscrimination statute that provides comprehensive civil rights protection for person with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. Any student with a disability who needs academic adjustments or accommodations should contact our disability support services <http://www.victoriacollege.edu/disabilityservices> to get an official letter to provide your instructor.

VC offers a wide range of resources, which include: advising & counselling services; career services, computer help desk, computer labs, disability support services, emerging scholars, the KEY center, the library, supplemental instruction, the testing center, tutoring services and veteran's affairs. For more information on any of these services, please see: <http://www.victoriacollege.edu/studentresources>

Common Questions

What Are Office Hours?

College professors have office hours – days and times we are available to answer subject and course questions. Generally, appointments for office hours are not needed. Watch for announcements that cancel office hours for a day or a week. I sometimes have unavoidable meetings.

What is Tutoring?

Tutors are clever students who did well in the course in an earlier term. I work with our tutors semi-regularly to update them about our course, but they cannot read my mind. While I think the world of our tutors, I am biased in believing I'll give you a fuller knowledge base in office hours. When my times don't work or are not enough, visit the Tutoring Center in JH 106 or HSC 121C:

<http://www.victoriacollege.edu/tutoringcenter>

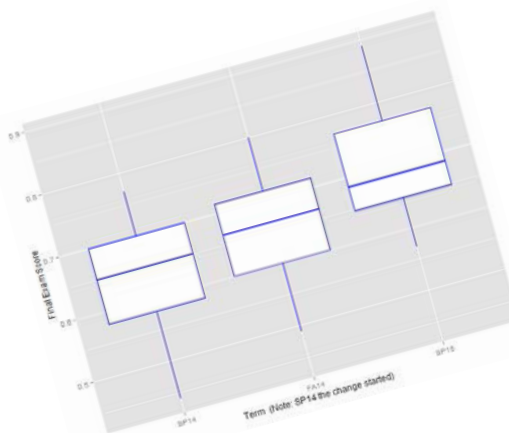
What about Exams?

There will be **two** 50 minute exams and **one** comprehensive final exam. For traditional courses, exams will most likely be paper based and in-class. For ITV courses, exams may come in a variety of formats and will be given in or near the classroom you normally attend. Online course exams will be taken at the Victoria College Testing Center, Main Campus (students wishing to use other centres must contact the instructor in advance via email by the second week of class and must receive written approval). According to VC policy, failure to take the final exam will result in a course grade of F.

What about Quizzes?

Timed quizzes are given at least weekly. Quiz access requires at least a

70% on linked homework assignments – this is imperative! There are no make-up quizzes. Quizzes may have questions from prior weeks. We may use the LockDown browser provided by WebAssign; it is your responsibility to install this browser on your personal computer with our BYOD campus.



I have to do homework?

Homework assignments happen online each week using WebAssign. You will register with WebAssign (instructions in Canvas). Submit before the due date stated on the assignment if not earlier! If you have problems submitting assignments, contact me and [WebAssign Student Support](#) immediately so that we can get the problem solved. Again, no late assignments and you **MUST** purchase an access code!

What is Active Learning?

There is a course engagement grade collected via submitted assignments, communication with the instructor, and sometimes a capstone project. Specifics are provided as term progresses. Ways to prepare include ensuring you receive your Pirate email, regularly communicating with me in a professional manner, and looking in Canvas for "Active Learning" folders.

Help – I want extra credit!

I do not offer extra credit – it detracts from the importance of learning the concepts and material in the course. A more effective use of your time would be to spend it working on the material including the *explorations*.

Also, scores will not be 'curved' although I reserve the right to use my professional judgement in justly and fairly awarding earned grades. You earn your grade.

I dread after-final-exam emails, phone calls, and office visits begging for higher grades. It feels particularly sleazy when I haven't even finished grading. I strive to be ethical, just, and fair to each of my students. It is a responsibility I take quite seriously. Absolutely please contact me if I make a clerical error! I want you to know I use a double check process and am exceptionally proud that with over 8 years of recording earned grades, I have yet to need to make a correction. I consider your grade extraordinarily important – I know well just what a difference a single grade can make in a course, on a transcript, for a scholarship, and in a career. In this case, I must ask you to trust me. I greatly hope I earn your trust over our class together. If not, I absolutely encourage you to contact the dean or chair for mathematics.

How do I teach?

You should actively read our textbook, ask me for help, and regularly communicate questions to me. Learning how to actively read a mathematics textbook is an essential and somewhat complex skill that takes regular practice. Email me about best practices for reading your textbook early and often!

The Human Side of Mathematics



Matt Wiley is a tenured, associate professor of mathematics with awards in both mathematics education and honour student engagement. He holds degrees in pure mathematics, computer science, and business from [UC](#) and [TAMU](#) systems. He is director at Victoria College for quality enhancement and assists in the development and implementation of a comprehensive assessment program to enhance institutional performance outcomes. With programming experience in R, C++, Ruby, Fortran, and JavaScript, he has always found ways to meld his passion for writing with his joy of logical problem solving and data science. From the boardroom to the classroom, Matt enjoys finding dynamic ways to partner with interdisciplinary and diverse teams to make complex ideas and projects understandable and solvable.

Web Resources:

<http://mattwiley.org/>
<http://mattwiley.org/courses/Statistics.php>
<https://www.webassign.net/login.html>
<http://www.victoriacollege.edu/tutoringcenter>
<http://www.victoriacollege.edu/studentresources>

My Promise to You:

As your professor, I should provide content that is timely, pertinent, and current based on sound research – not hearsay. I'll both provide to you and consider from you feedback; I'll strive to answer questions in a fashion that helps you develop deeper learning in all course objectives. While you may never see this directly, I'll read cutting edge research relating to this course, and do my best to be a global expert as possible. I care about active, deeper learning. I support you in your critical thinking and communication skills – even if this means telling you text speak isn't professional. I want to earn your trust, live ethically, and create a useful class and course that allows my students the environment needed for their success. I will be friendly, fair, just, and firm. I'll be the mentor you deserve, but not always the one you want right now. Because as your professor, I am not a friend or hero but rather an outspoken guide. A watchful protector.

You will find that help
will always be given at
Hogwarts to those who
ask for it.
– Dumbledore

Never be shy asking questions in discussion board posts or via email!

Your Responsibility to Me:

Care about learning! Do not sell yourself short! Your education is a noble, worthy goal, and you're allowed to be enthusiastic and nerdy.

Thoughtfully prepare by reading textbook sections and submitting assignments. I've put work into our course; as a human, I enjoy seeing those efforts reciprocated and appreciated.

Actively participate in our course – think about what you're learning, how it fits in with past knowledge, and what our future goals are. Bravely consider my constructive critiques.

Reach out to me and communicate. Know the absolute worse I can ever reply to you is 'no' which isn't really all that bad. Trust I strive to make our course equitable, legal, fair, just, and merciful.

Introduce yourself to me if we meet in the real world – I have frightened too many complete strangers by asking them how their maths classes are going to risk making the first move. I enjoy talking outside of class!

Contact Information

Office Location: CAPE 110
 ([Building 9](#))

Email:
Matt.Wiley@VictoriaCollege.edu

Regular Office Hours:
www.MattWiley.org

Division: Science, Maths, & Phys. Ed.
 Department: Mathematics
 Office Phone: 361.582.2468

Wise Advice:

Do our homework regularly. Ask questions when you do not understand. Review for exams by revising past homeworks and quizzes. Practice extra questions!

I create all course activities with purpose to help you self-assess your growing skill in the material and outcomes of our course.

I rather doubt I've assigned anywhere near enough homework questions to help you practice these ideas enough so that you're fluent and achieve mastery. Most mathematics textbooks have answers to either odd or even questions – I'm imagining you'll work on those even or odd problems long enough that you'll get good at these. You're not only allowed to ask questions, I encourage you!

Timed quizzes are designed to be solvable by a student with a reasonable level of fluency in solving those types of problems. If you're having trouble finishing quizzes on time, but you know you could solve them, practice more problems. Visit my office hours!

Sometimes quiz questions look familiar, but perhaps you've solved the problem so many different (wrong) ways before that last time when you got it right. Practice extra problems just like the one you're learning once you've finally get it right. That way you practice solving problems correctly.

Often, near the start of a chapter or section there will be goals. As you read as yourself "How well do I understand those goals?" "Could I solve those types of problems from memory, or do I still need more practice?"

Please Visit Me!

I enjoy meeting students in office hours. I keep a jar of chocolates for just such occasions. Sometimes, just chatting about the world through a statistician's eyes helps you feel more comfortable with the philosophy of statistics. That can be a powerful thing.



Technology/Life Warning

It is expected college students are reasonably adept at the use of internet technologies. This includes the understanding that network and computer glitches are a possibility. While your professor and Victoria College may work with students in the event of widespread system outages, the accepted protocol is that these situations are already handled by having more points than required available in the course. Events beyond student control (e.g. forgotten assignments, computer viruses, sudden illness, burglary, vampires, or surprise vacations) do occur, and to treat all students fairly, I provide additional ways for students to demonstrate their skill-mastery. It is not appropriate to email your professor requesting makeups for such scenarios. Our entire course is open from day one and it is possible to work ahead should your life potentially require more flexibility. Running a virus scan, restarting your computer, having a solid Internet connection (that other people aren't using), and only having your browser open are wise ideas for quizzes.

Academic Integrity:

The very nature of higher education requires that students adhere to accepted standards of academic integrity. Therefore, Victoria College has adopted a policy of academic conduct as described in the Student Handbook. It is the student's responsibility to be aware of the behaviours that constitute academic dishonesty.

Copyright Policy

All printed materials disseminated in class or on the web are protected by copyright laws. One copy (or download from the web) is allowed for personal use. Multiple copies or sale of any of these materials is strictly prohibited.

MATHEMATICS
is not about
numbers, equations,
computations, or
algorithms:
it is about
UNDERSTANDING.

William Paul Thurston

You Will Understand Statistics!

I know you can do it. It will take hard work, but I know you're not afraid to try! Remember, I can help.

Tentative Class Calendar

| Week Module | Each Major Assignment and Examination |
|------------------------------|--|
| 1 A 17 Jan. | Welcome, Syllabus, and Course Overview/Expectations 1.1 Definitions of Statistics, Probability, and Key Terms 1.2 Data, Sampling, and Variation in Data and Sampling Quiz |
| 2 A,B 23 Jan. | 1.3 Frequency, Frequency Tables, and Levels of Measurement 1.4 Experimental Design and Ethics 2.1 Stem-and-Leaf Graphs (Stemplots), Line Graphs, and Bar Graphs Quiz |
| 3 B,C 30 Jan. | 2.2 Histograms, Frequency Polygons, and Time Series Graphs 2.3 Measures of the Location of the Data 2.4 Box Plots 2.5 Measures of the Center of the Data Quiz |
| 4 C,D 6 Feb. | 2.6 Skewness and the Mean, Median, and Mode 2.7 Measures of the Spread of the Data 3.1 Terminology 3.2 Independent and Mutually Exclusive Events Quiz |
| 5 D 13 Feb. Over A-D | 3.3 Two Basic Rules of Probability 3.4 Contingency Tables 3.5 Tree and Venn Diagrams Exam I (60 min. over Ch.1-3) Thur. –Mon. (16-20 Feb. at VC Testing Center) |
| 6 E 20 Feb. | 4.1 Probability Distribution Function (PDF) for a Discrete Random Variable 4.2 Mean or Expected Value and Standard Deviation. 4.3 Binomial Distribution 4.4 Geometric Distribution Quiz |
| 7 E 27 Feb. | 5.1 Continuous Probability Functions 5.2 The Uniform Distribution 5.3 The Exponential Distribution Quiz |
| 8 F 6 Mar. | 6.1 The Standard Normal Distribution 6.2 Using the Normal Distribution Quiz Active Learning Assignment: Course Reflection essay due in Canvas |
| Spring Break | If at all possible, use this time to get caught up, get ahead, or start revising for the final exam. |
| 9 F 20 Mar. | 7.1 The Central Limit Theorem for Sample Means (Averages) 7.2 The Central Limit Theorem for Sums 7.3 Using the Central Limit Theorem Quiz |
| 10 G 27 Mar. | 8.1 A Single Population Mean using the Normal Distribution 8.2 A Single Population Mean using the Student t Distribution 8.3 A Population Proportion Quiz |

| Week Module | Each Major Assignment and Examination |
|------------------------------|---|
| 11 H 3 Apr. | 9.1 Null and Alternative Hypotheses 9.2 Outcomes and the Type I and Type II Errors 9.3 Distribution Needed for Hypothesis Testing 9.4 Rare Events, the Sample, Decision and Conclusion 9.5 Additional Information and Full Hypothesis Test Examples Quiz |
| 12 E-H Over E-H 10 Apr. | Review for Exam II over Chapters 4-9. Exam II (60 min. over Ch.4-9) Wed. –Tue. (12–18 Apr. at VC Testing Center) |
| 13 H 17 Apr. | 10.1 Two Population Means with Unknown Standard Deviations 10.2 Two Population Means with Known Standard Deviations 10.3 Comparing Two Independent Population Proportions 10.4 Matched or Paired Samples Quiz |
| 14 I 24 Apr. | 12.1 Linear Equations 12.2 Scatter Plots 12.3 The Regression Equation 12.4 Testing the Significance of the Correlation Coefficient 12.5 Prediction Quiz |
| 15 Capstone 1 May | Course Capstone Review for Final Exam |
| 16 Over A-I | Final Exam (2.5 hours over ALL) Sat. – Wed. (6-10 May at VC Testing Center) |

Victoria College Student Services

| Resource | Location & Contact |
|--|---|
| Admissions & Records & Welcome Center <i>Admissions Applications, Transcripts, Grade Submission</i> | Student Services Building, Welcome Center, Suite 107 (361) 485-6841 http://www.victoriacollege.edu/admissionsrecords |
| Advising & Counseling <i>Academic Advising, Career & Personal Counseling, Disability Support Services, Veterans Services</i> | Student Services Building, Suite 105 (361) 582-2400 http://www.victoriacollege.edu/advisingcounselingservices |
| Financial Aid <i>Childcare Assistance, PELL, Student Loans, Scholarships, Work Study</i> | Student Services Building, Suite 108 (361) 572-6415 http://www.victoriacollege.edu/financialaid |
| KEY Center <i>The KEY Center is a federally funded program providing support services for eligible students.</i> | Johnson Hall, Room 101 (361) 582-2414 http://www.victoriacollege.edu/keycenter |
| Pre-College Programs/Dual Credit and Recruitment <i>Recruitment and TexPREP (summer program)</i> | Student Services Building, Suite 105 (361) 485-6823 http://www.victoriacollege.edu/precollegeprograms |
| Student Activities Office <i>Student Government Association, Student Clubs, Activities, Halloween Carnival, Welcome Information Booths</i> | Student Center (361) 485-6838 http://www.victoriacollege.edu/studentactivities |
| Student Testing Services <i>TSI, GED, SAT, ACT, Online Testing</i> | Continuing Education Center, Suite 202 (361) 582-2589 http://www.victoriacollege.edu/testingcenter |
| Tutoring Services <i>Individual and Group Tutoring</i> | Main Tutoring & Study Center: Johnson Hall, Room 106 – (361) 572-6473 Science Tutoring Center: Health Sciences Center, Room 121C – (361) 573-3291 ext. 3282 Gonzales Center Tutoring Room – (830) 672-6251 http://www.victoriacollege.edu/tutoringcenter |
| Vice President of Student Services <i>Student Handbook, Student Code of Conduct, Discipline Issues, Financial Aid Appeals</i> | Student Services Building, Room 102 (361) 582-2516 http://www.victoriacollege.edu/studentervices |

Updated 08.15.2014

Additional information on Student Support Services can found in *The Victoria College Student Handbook*. A link to the Handbook is in the Publications & Dates folder in the Pirate Portal. A hardcopy of *The Handbook* can be obtained by contacting any Student Services office.