

COURSE DESCRIPTION

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The purpose of this course is to improve your numeracy and critical thinking skills to help you make better decisions in both your personal and professional life. To achieve this, you will learn about probability, how to make sense of raw data, how best to describe data to others, and how to solve problems and test predictions using statistics. The components of this course have been designed with care to maximize your opportunities to learn in an engaging and supportive environment.

We look forward to exploring the often counterintuitive world of statistics with you.

TOPICS

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Module	Topic
0	Course Overview
1	Anatomy of a Statistical Study
2	Study Designs and Sampling
3	Descriptive Statistics
4	Visualizations
5	Probability
6	Sampling Distributions
7/8	Hypothesis Testing and T-tests
9	Chi-Square Test
10	Linear Regression
11	Single-Factor ANOVA
12	Two-Factor ANOVA

COURSE LEARNING OUTCOMES

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After completing this course, students should have the knowledge and skills to do the following:

1. Identify the features of a data set to determine how best to summarize and display it.
2. Choose the appropriate statistical test and provide the rationale for selection.
3. Compute basic parametric statistical tests to test hypotheses.
4. Interpret the results of statistical tests and data software output to be able to draw valid conclusions.
5. Apply knowledge of statistics and research design (e.g., sampling) to critically evaluate research findings.

UNIVERSITY OPERATING DATES

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Please visit the Faculty of Arts and Sciences Sessional Dates website for all academic deadlines.

## COURSE TIMELINE

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The Course Timeline shows all relevant course dates, including assessments, as well as links to other important course information. As dates may change, you should consult the Timeline each time you log in to the course.

Please note, some students may see an onQ Calendar for their course. However, the onQ calendar does not display all dates associated with your course assignments. For complete information on all of your assignments in this course and the start and close dates, please refer to the **Course Timeline**.

If there are discrepancies between dates in the course onQ site, the Timeline will be considered accurate.

All times are in Kingston time (Eastern Time).

## LAND ACKNOWLEDGEMENT

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Queen's University is situated on traditional Anishinaabe and Haudenosaunee Territory. To acknowledge this traditional territory is to recognize its longer history, one predating the establishment of the earliest European colonies. It is also to acknowledge this territory's significance for the Indigenous peoples who lived, and continue to live, upon it – people whose practices and spiritualities were tied to the land and continue to develop in relationship to the territory and its other inhabitants today. The Kingston Indigenous community continues to reflect the area's Anishinaabek and Haudenosaunee roots. There is also a significant Métis community and there are First Peoples from other Nations across Turtle Island present here today.

## EQUITY, DIVERSITY, AND INCLUSIVITY STATEMENT

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Queen's University recognizes that the values of equity and diversity are vital to and in harmony with its educational mission and standards of excellence. It acknowledges that direct, indirect and systemic discrimination exists within our institutional structures, policies and practices and in our community. These take many forms and work to differentially advantage and disadvantage persons across social identities such as race, ethnicity, disability, gender identity, sexual orientation, faith and socioeconomic status, among other examples. In this class I will work to promote an anti-discriminatory, anti-racist and accountable environment where everyone feels welcome. Students in this class are encouraged to participate during class discussions and to support others in their participation. Because the class will represent a diversity of individuals, beliefs, backgrounds, and experiences, every member of this class is asked to show respect for every other member.

## NAME/PRONOUN

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Knowing and applying students' names and pronouns is a crucial part of developing a productive learning environment that fosters safety, inclusion, and personal dignity. This is an important part of the inclusion work here at Queen's.

If you wish to change how your name appears in onQ and on class lists, please follow these steps. You may also use this process to add your pronouns to the appearance of your name.

1. Log into SOLUS.
2. Click on Personal Information tab.
3. Click on the Names tab
4. Click on the Add New Name tab
5. Choose Preferred from the Name Type drop down menu
6. Enter your preferred name.
7. Click Save.

Please allow 24 to 48 hours for your preferred name to be registered within the system. If you have further questions or concerns please contact ITS at Queen's University.

## COURSE MATERIALS

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There are two types of course materials (both required)

1. The first is an ebook entitled "Taking the Anxiety out of Statistics" by Nelson & Beyer (Kendall Hunt Publishing). Note that no royalties are collected on this ebook. Please select "Student Section" when prompted. Note that the price of the textbook is in \$US.
2. Case-study videos and software guides will be available in onQ free of charge. The course uses Microsoft Excel, R, and RStudio, all of which are free for students. We recommend downloading R and RStudio to your desktop; however, course requirements can also be completed by using RStudio in the cloud (now called Posit cloud), which does not require a download. **Please note:** The R software required for this course is not compatible with Chromebooks.

## CALCULATOR POLICY

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Calculators acceptable for use during quizzes, tests and examinations are intended to support the basic calculating functions required by most Arts and Science courses. For this purpose, the use of **any Casio 991** series calculator is permitted and is the **only approved calculator for Arts and Science students**. This inexpensive calculator sells for around \$25 at the Queen's Campus Bookstore, Staples and other popular suppliers of school and office supplies.

## COPYRIGHT OF COURSE MATERIAL

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The material on this website is copyrighted and is for the sole use of students registered in STAM 200. The material on this website may be downloaded for a registered student's personal use, but shall not be distributed or disseminated to anyone other than students registered in STAM 200. Failure to abide by these conditions is a breach of copyright, and may also constitute a breach of academic integrity under the University Senate's Academic Integrity Policy Statement.

## STUDY HABITS FOR SUCCESS

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Active learning requires a different set of study habits than passive learning—here are some study habits to help you succeed.

- **Preparation is key**

Make sure to devote enough time to master the weekly module material. Cramming at the last minute may work for passive learning, but it does not give you enough time to build the connections across the material that you need for active learning.

- **Seek help early**

The online material contains lessons, quizzes, and additional resources to get you ready for each week. Give yourself the time to work through the main material, and any of the additional resources when you find concepts more challenging.

- **Reading is not enough**

The central part of active learning is that you are at the center of your learning. Working through the online material gives you a foundation, but you need to develop the connections that come from applying the material. Some good strategies are to write a brief set of paragraphs to summarize the material, work in study groups to discuss the ideas, go through the quiz questions with a study partner, and come to help sessions.

## NETIQUETTE

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In any course you often communicate with your peers and teaching team through electronic communication. You are expected to use the utmost respect in your dealings with your colleagues or when participating in activities, discussions and online communication.

Here is a list of netiquette guidelines. Please read them carefully and use them to guide your communication in this course and beyond.

1. Make a personal commitment to learn about, understand, and support your peers.
2. Give others the benefit of the doubt.
3. Ensure your writing is respectful and inclusive.
4. Recognize and value the experiences, abilities, and knowledge that each person brings.

5. Carefully re-read your writing before posting or sending to others.
6. It's okay to disagree with ideas, but personal attacks will not be tolerated.

## SUGGESTED TIME COMMITMENT

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Students can expect to spend approximately **9** hours a week in study/practice and online activity for this course.

- Online Lesson: 2-4.5 hours (as needed)
- Tutorials: 1.5 hours
- Software Guides: 1 hour
- Additional Practice: as needed

## COURSE ANNOUNCEMENTS

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Throughout the course, I will post announcements to the class, including reminders of upcoming due dates, responses to frequent questions, corrections to broken links, etc. I encourage you to routinely check the Announcements section of the course homepage in onQ. To ensure that you receive these announcements promptly, I also recommend that you enable email notifications to your Queen's email address.

## QUESTIONS ABOUT THE COURSE AND CONTACTING THE TEACHING TEAM

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The teaching team contact information is located on the Homepage of the course (see Teaching Team).

For general questions about the course, please post to the weekly Course Questions Forums. Feel free to help answer your peers' questions on this forum. Most questions are answered within 24 hours.

Please use the course email for inquiries that are about the logistics of the course, such as where to find due dates, or where your exam is written. A Teaching Assistant will typically respond within 24 hours. **Note:** If you have questions about course material you should bring those to a help session or post them to the online forum.

**Course email:** in2statscds@queensu.ca

## QUEEN'S EMAIL

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The university communicates with students via Queen's email. Please check your email regularly to ensure you do not miss important information related to your course.

## COURSE FEEDBACK

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At various points during the course, I may ask you to take part in a variety of feedback activities, such as surveys and questionnaires. This feedback enables my teaching team and me to make any adjustments necessary to improve your learning environment. Additional feedback may be requested throughout the course. All surveys are anonymous and are directly related to activities, assessments, and other course material.

## WEIGHTING OF ASSESSMENTS

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Assessment	Location	Weight	Learning Outcomes	Content Elements
Software Skills Quizzes (x3)	Online	12%	1-5	Software Guides
Weekly Quizzes	Online	14%	1-4	Online modules, Software Guides
Tutorial Activities	Tutorial	24%	1-5	Incorporates all content
Term Tests (x2)	Online	20%	1-4	Online modules, Case study videos, Practice Problems
Final Exam	Online	30%	1-5	Online modules, Case study videos, Practice Problems

### Location and Timing of Final Examinations

Once the exam schedule has been finalized the exam date will be posted on your SOLUS account. The exam dates for each Term are listed on the Faculty of Arts and Science webpage under "Important Dates." Student exam schedules for the Fall Term are posted via SOLUS immediately prior to the Thanksgiving holiday; for the Winter Term they are posted on the Friday before Reading Week, and for the Summer Term they are individually noted on the Arts and Science Online syllabi. Students should delay finalizing any travel plans until after the examination schedule has been posted. Exams will not be moved or deferred to accommodate employment, travel/holiday plans or flight reservations. For more information regarding what is considered extenuating circumstances and qualifications for Academic Consideration, please visit <https://www.queensu.ca/artsci/undergraduate/student-services/academic-consideration>

or email [asc.consideration@queensu.ca](mailto:asc.consideration@queensu.ca).

## DESCRIPTIONS OF LEARNING ACTIVITIES AND ASSESSMENTS

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### Software Skills Quizzes

Software Skills quizzes are timed quizzes designed to evaluate your skills in Microsoft Excel and R based on what you've been taught in the preceding tutorials. The quizzes start at a fixed time (see Timeline for dates and times) and are done online. It is the responsibility of the student to ensure that they are using a reliable computer and internet connection, and are working in a physical space that is amenable for the quiz.

### Weekly Preparatory Quizzes

There are 10 quizzes, each open for a week (see Timeline for dates and times). The quizzes will consist of multiple-choice questions based on the weekly material from online modules, self-assessment and software guide (when applicable). You can take the quiz up to 5 times. Your highest mark will be recorded as your mark for the quiz.

### Tutorial Activities

There are 10 synchronous (live) tutorial activities in the course. Each of these are completed in a virtual group of 3–5 students. The tutorials are performance-based activities designed to reinforce concepts from all aspects of the course. These activities are intended to help you see the utility of statistics in your respective discipline. **Attendance to the tutorials is required.**

**Please note the following important policies related to online group tutorials.** Each week you will sign up for one tutorial section that works with your schedule. You must attend the tutorial that you signed up for to receive a grade. If you attend a tutorial that you did not sign up for, you will receive a grade of zero (even if you completed the tutorial activity). The tutorials are capped, so please sign up early if you have constraints in your weekly schedule. You can change your tutorial at any point by unenrolling and then signing up for a new tutorial. However, only do this if there is space in another tutorial. There is enough space for all students to sign up for a tutorial over the week, but once the week starts some tutorials will become full. If you enroll late, or unenroll from a tutorial during the week, and cannot find a new spot, you will not be able to complete the tutorial and will receive a zero grade. See the Timeline and Live Tutorials page for tutorial details and due dates.

### Term Tests

The two term tests (2 x 10%) will be written in Week 6 and Week 10 (see the Timeline for exact dates). Term Test 1 covers material Weeks 1-5 and Term Test 2 covers materials from Weeks 1-9 with emphasis on Weeks 6-9. Term tests will be multiple choice and short answer. Each term test will cover material from the online modules, case study videos, module practice problems and elements of the tutorials.

### Final Exam



The Final Exam is three hours in length and includes multiple-choice and short answer questions based on the material from the entire term, including all online modules, case study videos, module practice problems and elements of the tutorials.

### Exam Dates

The specific dates for each exam will be announced later in the term by the Registrar's office. Once the exam schedule has been finalized the exam date will be posted on your SOLUS account.

Please note that the Senate Policy on Academic Consideration for Students in Extenuating Circumstances is applicable during the final examination period. In the Faculty of Arts and Science, students who are too ill to write the examination or are experiencing extenuating circumstances are being directed to the Academic Consideration Request Portal (ACRP) to submit a request for consideration.

## ACCOMMODATIONS FOR ASSESSMENTS

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Queen's University supports Universal Instructional Design to create more accessible learning environments. In addition to incorporating a variety of delivery methods and learning materials, this course has several academic accommodations built directly into the assessments. For most students, the assessment design incorporates extra time on assignments/tests and computer-assisted examinations.

If you have a formal academic accommodation that goes beyond the accommodations described below, please reach out to us so we can arrange appropriate solutions. We rely on accommodations registered with Ventus. You may read more about our approach to academic accommodations and considerations in the relevant sections of the course syllabus (see Policies below).

**Weekly Quizzes** are completed online, in a location of your choosing, and are open for one week. The quizzes take from 30-50 minutes to complete depending on the week. The 7-day window provides for any time accommodations, as well as enough time to attend the help sessions. If you cannot write one or more of the weekly quizzes and have an approved academic consideration, your total quiz grade will be evenly redistributed across the completed quizzes.

**Tutorial Activities** are completed during synchronous (live) tutorial times indicated on the Live Tutorials and Help Sessions page. Since the live tutorials include group work, students will need to work together during the scheduled time. It is not possible to have individual accommodations for these group activities; however we open up the tutorial activity ahead of time so that you can prepare before coming to tutorial. You must have attended the virtual tutorials to submit a report. If you are absent and have an approved academic consideration, your tutorial grades will be redistributed over the tutorials for which you were present.

**Software Skills Quizzes** are completed at a scheduled time but in a location of your choosing. These are timed quizzes, and we provide extra time (up to 30 min per 1 hour) in the design of the quiz. For example, most students take less than 30 minutes to complete the quizzes, but we schedule 45 minutes. If you require extra time for an approved accommodation, we will gladly add that to your individual quiz once you submit your QSAS accommodation (see the course homepage). If you



cannot write one or more of the software skills quizzes and have an approved academic consideration, your total software skills quiz grade will be evenly redistributed across the completed quizzes.

**Term Tests and Final Exam** are written during scheduled times—please see the Course Timeline for details. We provide extra time (up to 30 min per 1 hour) in the design of the assessment. For example, most students take about 80 minutes to complete the term tests, but we schedule 2 hours. If you require extra time beyond 30min/hr for an approved accommodation, we will gladly add that to your test once you submit your QSAS accommodation (see Accommodations in the Policies section below, or click the blue Accommodations button on the course homepage).

If you cannot write a term test and have an approved academic consideration, your final exam will be reweighed to include the weight of the term test. For example, if you miss the first term test (worth 10%), the final exam will increase from 30% to 40%. There are no makeup term tests because the final exam is cumulative and affords you the opportunity to demonstrate the knowledge that you would have otherwise exhibited in the term test(s).

If you cannot write the final exam and have an approved academic consideration, you will be required to write a deferred exam at some point during the following academic term.

## LATE ASSIGNMENT SUBMISSION POLICY

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Tutorial activities are due at the end of your scheduled tutorial + a 30-minute grace period. There is a late penalty of 10% per day (or part of a day) after the end of the grace period. Group assignments and individual R scripts will not be accepted more than 3 days late.

## GRADING SCHEME AND METHOD

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All components of this course will receive numerical percentage marks. The final grade you receive for the course will be derived by converting your numerical course average to a letter grade according to Queen's Official Grade Conversion Scale:

### Queen's Official Grade Conversion Scale

Grade	Numerical Course Average (Range)
A+	90-100
A	85-89
A-	80-84
B+	77-79
B	73-76
B-	70-72

C+	67-69
C	63-66
C-	60-62
D+	57-59
D	53-56
D-	50-52
F	49 and below

## ACADEMIC SUPPORT

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All undergraduate students face new learning and writing challenges as they progress through university: essays and reports become more complex; effectively incorporating research into writing becomes more important; the types of assignments become more diverse; managing your time and developing the skills you need to read and think critically gets more challenging. I encourage students to contact **Student Academic Success Services (SASS)**. SASS offers many different ways to receive support:

- Free online or in-person appointments to get personalized support on writing and academic skills from expert staff and trained peers.
- Workshops and drop-in programs. SASS' Events Calendar lists events coming soon.
- Online resources that provide strategies for academic skills and writing development at university.
- If English is not your first language, SASS has specific resources for English as Additional Language students, including weekly programs and EAL academic skills appointments. You can meet on an ongoing basis with an EAL consultant to work on your academic writing, speaking, listening, and reading skills.

## ACCOMMODATIONS FOR DISABILITIES

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Queen's University is committed to working with students with disabilities to remove barriers to their academic goals. Queen's Student Accessibility Services (QSAS), students with disabilities, instructors, and faculty staff work together to provide and implement academic accommodations designed to allow students with disabilities equitable access to all course material (including in-class as well as exams). If you are a student currently experiencing barriers to your academics due to disability related reasons, and you would like to understand whether academic accommodations could support the removal of those barriers, please visit the QSAS website to learn more about academic accommodations or start the registration process with QSAS by clicking **Access Ventus** button at **Ventus | Accessibility Services | Queen's (queensu.ca)**

VENTUS is an online portal that connects students, instructors, Queen's Student Accessibility Services, the Exam's Office and other support services in the process to request, assess, and implement academic accommodations.

To learn more go to the Visual Guide to Ventus for Students.

## ACADEMIC CONSIDERATIONS FOR STUDENTS IN EXTENUATING CIRCUMSTANCES

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Queen's University is committed to providing academic consideration to students experiencing extenuating circumstances that are beyond their control and are interfering with their ability to complete academic requirements related to a course for a short period of time. Click [here](#) to view the Senate Policy on Academic Consideration for Students in Extenuating Circumstances.

Please see the Academic Consideration Requests button on the course homepage to apply for an academic consideration in this course. Note that you will be taken to the student request portal where you will be required to provide the name and email address of the instructor/coordinator. For this course, please be sure to use the following email address: [in2statscds@queensu.ca](mailto:in2statscds@queensu.ca).

### Exemption for Academic Consideration or QSAS Accommodation

Students may be exempted for up to four (4) tutorials and/or quizzes per term for approved academic considerations or ongoing/chronic conditions per Letters of Accommodation (LOA) issued by QSAS. If you require exemption for more than 4 tutorials and/or quizzes, an alternative assessment may be provided.

## ACADEMIC INTEGRITY

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Queen's University is dedicated to creating a scholarly community free to explore a range of ideas, to build and advance knowledge, and to share the ideas and knowledge that emerge from a range of intellectual pursuits. Queen's students, faculty, administrators and staff therefore all have responsibilities for supporting and upholding the fundamental values of academic integrity. Academic integrity is constituted by the five core fundamental values of honesty, trust, fairness, respect and responsibility and by the quality of courage. These values and qualities are central to the building, nurturing and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University.

The following statements from "The Fundamental Values of Academic Integrity" (2nd edition), developed by the International Center for Academic Integrity (ICAI), contextualize these values and qualities:

1. **Honesty:** Academic communities of integrity advance the quest for truth and knowledge through intellectual and personal honesty in learning, teaching, research, and service.
2. **Trust:** Academic communities of integrity both foster and rely upon climates of mutual trust. Climates of trust encourage and support the free exchange of ideas which in turn allows scholarly

inquiry to reach its fullest potential.

3. **Fairness:** Academic communities of integrity establish clear and transparent expectations, standards, and practices to support fairness in the interactions of students, faculty, and administrators.
4. **Respect:** Academic communities of integrity value the interactive, cooperative, participatory nature of learning. They honor, value, and consider diverse opinions and ideas.
5. **Responsibility:** Academic communities of integrity rest upon foundations of personal accountability coupled with the willingness of individuals and groups to lead by example, uphold mutually agreed-upon standards, and take action when they encounter wrongdoing.
6. **Courage:** To develop and sustain communities of integrity, it takes more than simply believing in the fundamental values. Translating the values from talking points into action -- standing up for them in the face of pressure and adversity -- requires determination, commitment, and courage.

Students are responsible for familiarizing themselves with and adhering to the Senate regulations concerning academic integrity, along with Faculty or School specific information. Departures from academic integrity include, but are not limited to, plagiarism, use of unauthorized materials, facilitation, forgery and falsification. Actions which contravene the regulation on academic integrity carry sanctions that can range from a warning, to loss of grades on an assignment, to failure of a course, to requirement to withdraw from the university.

## TECHNOLOGY REQUIREMENTS

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Please note that mobile devices are not recommended for the course as they cause several known issues in onQ.

Computer Specifications	Supported Browsers	Internet Connection
<ul style="list-style-type: none"> <li>Windows 8.1 or newer</li> <li>OS X 10.13 (High Sierra) or newer</li> <li>Dual Core 2 GHz processor</li> <li>4 GB RAM</li> <li>Soundcard</li> <li>USB headset</li> <li>Webcam</li> </ul>	<ul style="list-style-type: none"> <li>Chrome (preferred - latest version)</li> <li>Firefox (latest version)</li> <li><b><i>Safari is not recommended as it causes several known issues in onQ</i></b></li> <li><b><i>Edge is not recommended as it causes several known issues in onQ</i></b></li> </ul>	<ul style="list-style-type: none"> <li>Wired high speed access: Cable or better</li> <li><b><i>Wifi is not recommended</i></b></li> <li>A minimum download speed of 10 Mbps and up to 20 Mbps for multimedia is recommended</li> <li>Click here for an Internet speed test</li> </ul>
Java	Media Player	Adobe Reader
<ul style="list-style-type: none"> <li>Latest version</li> </ul>	<ul style="list-style-type: none"> <li>HTML5 compatible</li> </ul>	<ul style="list-style-type: none"> <li>Latest Version</li> </ul>

## STUDENTS STUDYING OR TRAVELLING ABROAD

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If you plan to travel, we strongly recommend that you confirm Internet availability in your host country prior to departure. In the past, students in other countries have been blocked from accessing certain websites relevant to their courses, as well as onQ. It is the responsibility of all students to book travel around course work, as we cannot change the format or timing on assessments or assignments as a result of travel plans.