



# UNIVERSITY OF SASKATCHEWAN

Department of Biology

## COURSE SYLLABUS

### BIOL 226 - From Genes to Genomics

Course code:	CRN 22176	Term:	Winter (T2) 2022
Course credits:	3.0	Delivery:	Lecture & Lab
Class session:	01	Start Date:	January 10, 2022
Lecture room:	Thorvaldson 271	Lab room:	Thorv. G77. In person
Lectures:	M-W-F in person	Labs:	MTWRF
Website/notes:	Canvas access	Prerequisites	Biology 120.3 or 110.6

### General Description

Due to the recent University's announcement, the first day of class will be **January 10<sup>th</sup>, 2022**. Initially, classes will be delivered remotely for two weeks until **January 24<sup>th</sup>, 2022**, when in-person activities will resume. Please keep checking the website <https://covid19.usask.ca/all.php> for updated information about the University's COVID-19 policies and recommendations. **Any changes to the calendar, delivery method or important information will be provided through email or the Canvas website.**

The content of the biol-226 course ranges from Mendelian genetics to computational procedures based on the complete genome. Examples from eukaryotic species, including humans, are emphasized. Topics include classical transmission genetics, cytogenetics, DNA structure and replication, gene function, mutation and repair, regulation, recombinant DNA technology, and structural, functional, and comparative genomics.

Prerequisites: Biology 120.3 or 110.6

### Learning Context

If the conditions allow it, the BIOL226 course will be offered with face-to-face lectures and laboratories after **January 24<sup>th</sup>, 2022**. We have strived to make the best during these unprecedented times, and we ask that all participants in the course interact with empathy and care. Lectures will be delivered in-person (if possible) and the instructor may post pdf slides after the class for your revision. Lectures may be recorded, but this is not guaranteed nor an obligation of the instructor. Any other material or communications will be available through the course Canvas website. If you have any questions about how to access these files, please feel free to ask one of the instructors. Class exams (midterm and final), the laboratory component, including laboratory quizzes, will take place on campus. Additional details will be provided during the introductory session on the first day of class.

The University has put together information on tools and technologies to help students navigate the resources needed to be prepared for classes. You can access these resources at <https://students.usask.ca/study/get-prepared.php#Setupyourstudyspace>

We would also like you to review the Usask Netiquette webpage and encourage you to be mindful of your activities: <https://teaching.usask.ca/remote-teaching/netiquette.php>. If you are experiencing difficulty, please contact the instructors as soon as possible.

### Important guidelines:

It is important that we undertake the in-person elements of this class safely. To do so, the university has developed a set of expectations and safety protocols that all students must follow.

#### Throughout the term:

- ➔ **Protect the pack:** Right now, the impact of student choices and activities when not on campus cannot be separated from time spent on campus. In order to “protect the pack”, the university is asking all students to be mindful and do whatever possible to lower the risk that you will contract COVID-19 and bring it onto campus.
- ➔ **Know what is required and expected of you:** One of the critical lessons learned in dealing with COVID-19 is knowing that situations can change, and we must be flexible and ready to adjust our safety protocols. Instead of listing all of the relevant information in your course outline, the university has created [a webpage](#) where all up-to-date information around returning to campus is listed. **You are responsible** for **regularly** checking the health and safety guidelines <https://covid19.usask.ca/about/safety.php#Expectations> and knowing what is expected of you throughout the winter term.
- ➔ **Follow all guidance:** Students are expected to follow all guidance provided by the University’s Pandemic Recovery/Response Team (PRT), College/Department, professors, lab instructors, TAs, and any other staff member involved in the in-person academic program activities (e.g., Protective Services, Safety Resources).
- ➔ **Key channels of communication:** If there is a need for the class to pause meeting in-person for a period of time, you will be notified through email and/or Canvas. If this occurs, you will be provided with detailed information on what you will need to do in place of the in-person class sessions (e.g., read content posted in Canvas, complete learning activities, etc.). Course communications will primarily be submitted through the Canvas learning environment.

### Course Overview

This course combines classical genetics with modern molecular analysis. The first half of the course focuses on Mendelian genetics as it relates to the Chromosomal Theory of Inheritance. Practical applications of classical genetics principles such as linkage and recombination in building genetic maps are explored. In the second half, the course focuses on the fundamental molecular processes (transcription and translation) that coordinate the flow of genetic information (the Central Dogma of Molecular Biology). Then, we investigate how the genome is transcriptionally regulated to yield genetic variation at the level of the phenotype. The final component of the course provides insights on how alleles flow in a population and explores the evolutionary forces behind allele frequency changes (population genetics). This course is an introduction to important and basic genetics concepts

that permeate several other fields in the biological sciences and is intended to prepare students for senior molecular biology and genetic courses.

Note: The University of Saskatchewan Learning Charter is intended to define aspirations about the learning experience that the University aims to provide, and the roles to be played in realizing these aspirations by students, instructors, and the institution. A copy of the Learning Charter can be found at:

[http://www.usask.ca/university\\_secretary/LearningCharter.pdf](http://www.usask.ca/university_secretary/LearningCharter.pdf)

## Learning Outcomes

By the completion of this course, it is expected that students will be able to:

1. Describe Mendel's first and second law of genetics and identify how they relate to cytogenetics.
2. Predict the outcome of crosses and to carry out pedigree analysis.
3. Outline the principles of recombination and to map genes on chromosomes.
4. Recognize how expression of genetic information is related to phenotype
5. Describe how alleles behave in populations and identify the processes that contribute to evolutionary change.

## Instructors and Contact info:

Lecturer and Lab Coordinator:

Dr. Andres Posso-Terranova

Office: room G77 - THORV Building.

WebEx room: <https://usask.webex.com/meet/andres.posso>

Ph# 306-966-4431. Email: [andres.posso@usask.ca](mailto:andres.posso@usask.ca)

Office Hours: Specific appointments can be set by email.

## Head of the Biology Department:

Dr. Christopher Todd

Office: room CSRB 110.5 Ph# 306-966-4497

Email: [chris.todd@usask.ca](mailto:chris.todd@usask.ca)

## Instructor Profiles & Other Information:

Dr. Posso-Terranova has been a lecturer for the University of Saskatchewan in previous terms (Biol226 – Fall 2017). At the moment, he is the laboratory coordinator for genetics courses in the Department of Biology. He holds a MSc in plant breeding and genetics and obtained a PhD in evolutionary biology (Usask) working with endangered amphibian species.

## Required Resources

- **Textbook:** 'Introduction to Genetic Analysis' – 12th edition. Griffiths et. al. 2020. The *ebook* license with Achieve® is available through the bookstore. Achieve is an online platform with several learning resource features (<https://store.macmillanlearning.com/ca/digital/intro/achieve> )(Not mandatory).

- **Electronic Resources:** Students are encouraged to use Achieve® **as a supplementary tool (not for marks)**. It provides useful study questions and genetics exercises for practicing your understanding of the concepts.

- **Laboratory manual:** Each student **is required to purchase** an access code from the U of S campus bookstore for downloading an electronic file containing the laboratory manual (<https://artsandscience.usask.ca/ebook> ).

## Lecture Topics

The course material is organized around the main topics below:

### Part I

TOPIC 1 – Principles of Mendelian inheritance	Griffiths Ch. 2,3
TOPIC 2 – Chromosomal basis of inheritance	Griffiths Ch. 2,3
TOPIC 3 – Extensions of Mendelian principles	Griffiths Ch. 5
TOPIC 4 – Recombination and mapping	Griffiths Ch. 4
TOPIC 5 – Large scale chromosomal changes	Griffiths Ch. 17

### Part II

TOPIC 6 – The central dogma of molecular biology	Griffiths Ch. 8,9
TOPIC 7 – Gene isolation and manipulation	Griffiths Ch. 10
TOPIC 8 – Regulation of gene expression in bacteria	Griffiths Ch. 11
TOPIC 9 – Regulation of gene expression in eukaryotes	Griffiths Ch. 12
TOPIC 10 –Population Genetics	Griffiths Ch. 18

## Proposed Schedule

Weekly activities indicate the suggested pace of the course and the corresponding topics to be discussed in the lecture sessions. Other important in-person activities are also indicated.

### Part I – Classical Genetics

Week	Date	Activity
W1	Jan 10 – MON	Live: Course Introduction
	Jan 12 – WED	Introduction to genetics
	Jan 14 – FRI	Live Session
W2	Jan 17 – MON	Mendelian Inheritance
	Jan 19 – WED	Mendelian Inheritance
	Jan 21 – FRI	Live Review: Mendelian Inheritance
W3	Jan 24 – MON	Chromosomal Basis of Inheritance (CBI)
	Jan 26 – WED	CBI
	Jan 28 – FRI	CBI
W4	Jan 31 – MON	Review: CBI
	Feb 2 – WED	Gene Interactions
	Feb 4 – FRI	Gene Interactions
W5	Feb 7 – MON	Gene Interactions
	Feb 9 – WED	Review: Gene Interactions
	Feb 11 – FRI	Recombination and Mapping
W6	Feb 14 – MON	Recombination and Mapping
	Feb 16 – WED	Review: Recombination and Mapping
	Feb 18 – FRI	Lg scale chromosomal changes
<b>W7</b>	<b>Feb 21 – 25</b>	<b>Midterm break</b>
W8	Feb 28 -MON	Lg scale chromosomal changes

Mar 2 – WED	Review: Lg scale chromosomal changes
<b>Mar 4 – FRI</b>	<b><u>Midterm Exam. 10:30 a.m (TBC)</u></b>

### Part II – Molecular Genetics

Week	Date	Activity
W9	Mar 7 – MON	Intro: The Central Dogma of Molecular Biology (CDMB)
	Mar 9 – WED	CDMB: Transcription
	Mar 11 – FRI	CDMB: Translation
W10	Mar 14 – MON	CDMB: review
	Mar 16 – WED	Gene isolation and manipulation
	Mar 18 – FRI	Gene isolation and manipulation
W11	Mar 21 – MON	Regulation of gene expression (RGE): bacteria
	Mar 23 – WED	RGE: bacteria
	Mar 25 – FRI	RGE: bacteria
W12	Mar 28 – MON	RGE: eukaryotes
	Mar 30 – WED	RGE: eukaryotes
	Apr 1 – FRI	RGE: eukaryotes
W13	Apr 4 – MON	Population genetics: allele frequencies
	Apr 7 – WED	Population genetics: Hardy-Weinberg principle
	Apr 9 – FRI	Population genetics: review
<b>TBA</b>		<b><u>Final examination</u></b>

## Grading Scheme

Midterm exam 25%. Final exam 35%. Laboratory 40%

## Evaluation Components

### Midterm Exam:

Value: 25% of final course grade.  
Date: Tentative date: Friday, March 4th - 2022, 10:30 am. Lecture room - **To be confirmed.**  
Length: 50 minutes.  
Format: Multiple choice problems and questions. In-person activity, written on paper (if conditions allow it) or through Canvas.  
Description: Based on all lecture and study materials prior to the midterm exam date.

### Final Exam:

Value: 35% of final course grade.  
Date: To be announced (TBA).  
Length: 60-180 minutes (TBA).  
Format: Multiple choice problems and questions. In-person activity, written on paper (if conditions allow it) or through Canvas.  
Description: The exam is a comprehensive evaluation (i.e., it will cover all lectures and study material). Material delivered since the midterm exam will be emphasized.

### Laboratory:

Value: 40% of final course grade  
Date: see Laboratory Schedule  
Format: Varies by lab  
Description: A total of nine (9) lab assignments (20%) must be returned as physical copies (i.e., printed) or submitted online through Canvas, according to the lab schedule (deadlines). Two lab quizzes (20%) are based on the information provided in the briefings, video material, practical component, and laboratory manual. They will be performed in-person during the scheduled lab sessions and accessible through Canvas. Hence, a laptop computer or larger tablet will be required for taking the quizzes. The format includes multiple choice questions, fill in the blank, matching concepts, true/false, etc.

## Scheduling of Exams

Midterm, final examinations, and lab quizzes must be written on the date scheduled. Final examinations may be scheduled at any time during the examination period in April. Students should therefore avoid making prior travel, employment, or other commitments for this period.

In the event that a student is absent from the midterm exam through no fault of his/her own due to a medical emergency, death in the family, or other valid reasons, documentation must be provided explaining the absence, to assist in the determination of whether permission will be granted for the student to write a deferred midterm exam. Students absent for the midterm lecture exam must advise their instructor and initiate arrangements

for writing a deferred midterm exam within 3 working days of the missed exam, in order to avoid being assigned a grade of zero for the exam.

If a student is absent from the final exam through no fault of his or her own for medical or any other valid reason, he/she must apply to the Dean's Office of the College in which he/she is registered for an opportunity to write a Deferred Final Exam, within 3 working days of the missed exam. Documentation must also be provided to explain the absence from the final exam. Deferred exams may utilize a different format than the regular exam, at the sole discretion of the instructors.

Students are encouraged to review all examination policies and procedures here:

<https://students.usask.ca/academics/exams.php>

## **University of Saskatchewan Grading System**

Students in the BIOL 226 course are reminded that the University has established a grading system to be used in all its courses. Information on literal descriptors for grading at the University of Saskatchewan (reproduced below) can be found at: <https://students.usask.ca/academics/grading/grading-system.php>

## **Required Components**

Students must write the final exam to pass the course.

## **Late Assignments**

Lab assignments are due on the day and time indicated in Canvas and/or the lab schedule. Extensions are only granted in extraordinary circumstances (notably, as a result of family or medical emergencies) and upon receipt of adequate documentation. It is your responsibility to contact the laboratory coordinator before the due date if possible or as soon after the due date if it was unfeasible to do so beforehand.

## **Student Feedback:**

The Department of Biology or the instructors may survey students regarding the course. This is generally done through an assessment near the end of term.

## Lab Schedule (Winter 2022)

Laboratory Schedule  
 Biol226- Winter 2022  
 (Also available at the Lab's Canvas site)

Date	Week	Lab	Lab Exercise	Key points	Assignments / Lab Quizzes
January 17-21	1	Through Canvas	Check essential information and general introduction in Canvas (Module 1)	Presentation of lab details and support, how to access the genetics simulator, assignment requirements -Breeding experiment: Set up main cross ( $P_1 \times P_2$ )	
January 24-28	2	In person: lab # 1	Laboratory # 1. Introduction to genetics and monohybrid crosses	-The different stages of a model organism ( <i>Drosophila melanogaster</i> ) -Phenotypic traits and male vs. female flies' differentiation. - <i>Drosophila</i> genetics notation -Breeding experiment: Remove $P_1$ and $P_2$ flies, score parentals	- Return assignment # 1 at the end of the laboratory session (physical copy or through Canvas)
January 31 - February 4	3	In person: lab # 2	Laboratory # 2. <i>Drosophila</i> breeding experiment: $F_1$ generation and dihybrid crosses.	- Obtain and analyze $F_1$ and $F_2$ data that illustrate segregation and assortment. - Propose a genetics model of inheritance for several traits -Breeding experiment: score and analyze $F_1$ flies -Set up $F_1 \times F_1$ cross to obtain $F_2$ generation	- Return assignment # 2 at the end of the laboratory session (physical copy or through Canvas)
February 7-11	4	In person: lab # 3	Laboratory # 3. <i>Drosophila</i> breeding experiment: (Sex-linked traits).	-Obtained simulated $F_1$ data that illustrate sex-linkage. - Propose a genetic model of inheritance for several traits - Analyze hypothetical crosses that illustrate a gene-interaction -Breeding experiment: Remove $F_1$ parental flies and predict $F_2$ outcome.	- Return assignment # 3 at the end of the laboratory session (physical copy or through Canvas)
February 14-18	5	In person: lab # 4	Laboratory # 4. Gene linkage and chromosome mapping.	- Obtain $F_1$ data that illustrates trihybrid and test-crosses. - Describe the difference between independent assortment and gene linkage - Map two genes on a chromosome - Analyze real-case data from a trihybrid cross to map three genes -Breeding experiment: score and analyze $F_2$ flies	- Return assignment # 4 at the end of the laboratory session (physical copy or through Canvas)
February 21-25	6		<b>Midterm break. No lab sessions this week</b>		



<b>February 28 - March 4</b>	7	In person: lab # 5	Laboratory # 5. <i>Drosophila</i> eye color: A combination of protein pigments	<ul style="list-style-type: none"> <li>- Describe the <i>Drosophila's</i> protein-pigment differences.</li> <li>- Identify genes (enzymes) that are involved in the biosynthesis of protein pigments.</li> <li>- Recognize the epistatic interactions between pigmentation genes.</li> </ul>	<p><b>- Lab quiz # 1.</b> Room G77, during lab session time. Access through Canvas. Topics: Labs 1-4</p> <p>- Return assignment # 5 at the end of the laboratory session (physical copy or through Canvas)</p>
<b>March 7-11</b>	8	In person: lab # 6	Laboratory # 6. The Chi-square ( $X^2$ ) test: A statistical test for experiments.	<ul style="list-style-type: none"> <li>- Propose a scientific hypothesis for a genetic cross.</li> <li>- Calculate a <math>X^2</math> statistic value.</li> <li>- Use a calculated <math>X^2</math> value to determine whether there is a statistically significant difference between hypotheses</li> </ul>	<p>- Return assignment # 6 at the end of the laboratory session (physical copy or through Canvas)-</p>
<b>March 14-18</b>	9	In person: lab # 7	Laboratory # 7. <i>Drosophila</i> class data review: hypotheses testing and gene mapping	<ul style="list-style-type: none"> <li>- Determine the genetics model of inheritance of four genes</li> <li>- Propose a scientific hypothesis (dihybrid cross) and statistically test its validity.</li> <li>- Map three genes on a chromosome</li> </ul>	<p>- Return assignment # 7 at the end of the laboratory session (physical copy or through Canvas)-</p>
<b>March 21-25</b>	11	In person: lab # 8	Laboratory # 8. DNA genotyping of <i>Drosophila</i> mutants: The white-1 locus (w)	<ul style="list-style-type: none"> <li>- Establish the link between genotype and the white-eyes phenotype in <i>Drosophila</i>.</li> <li>- Identify two common molecular genetics methods.</li> <li>- Perform a PCR test to identify <i>Drosophila</i> mutants.</li> <li>- Perform a simulated PCR test to differentiate DNA sequences.</li> </ul>	<p>- Return assignment # 8 at the end of the laboratory session (physical copy or through Canvas)-</p>
<b>March 28 - April 1</b>	12	In person: lab # 9	Laboratory # 9. Population genetics: Gene pool and allele frequencies	<ul style="list-style-type: none"> <li>- Describe the gene pool concept.</li> <li>- Estimate genotype and allele frequencies based on phenotypic data.</li> </ul>	<p>- Return assignment # 8 at the end of the laboratory session (physical copy or through Canvas)-</p>
<b>April 4-8</b>	13		Lab evaluation and lab quiz # 2.	<ul style="list-style-type: none"> <li>- Lab evaluation and Lab quiz # 2</li> </ul>	<p><b>Lab quiz # 2.</b> Room G77, during lab session time. Access through Canvas. Topics: Labs 5-9</p>

## Recording of lectures or video conferences

- **Use of video and recordings in the course (if needed)**

Due to the pandemic situation, teaching and learning conditions may unexpectedly change. If video conference sessions that include your participation are recorded, this material will be available only to those students registered in the course (through Canvas and/or Panopto). If your instructor provides you with class recordings, please remember that this material belongs to your instructor, the University, and/or others (like a guest lecturer) depending on the circumstance of each session and are protected by copyright. Do not download, copy, or share recordings without the explicit permission of the instructor.

For questions about recording and use of sessions in which you have participated, including any concerns related to your privacy, please contact your instructor. More information on class recordings can be found in the Academic Courses Policy <https://policies.usask.ca/policies/academic-affairs/academic-courses.php#5ClassRecordings>

- **Required video use:**

Only if it is required to record video conferences, you may choose to have your video camera on during the conferencing sessions. It is not required for planned course activities.

## Copyright

Course materials are provided to you based on your registration in a class, and anything created by your professors and instructors is their intellectual property, unless materials are designated as open education resources. This includes exams, PowerPoint/PDF slides and other course notes. Additionally, other copyright-protected materials created by textbook publishers and authors may be provided to you based on license terms and educational exceptions in the Canadian Copyright Act (see <http://laws-lois.justice.gc.ca/eng/acts/C-42/index.html> ).

Before you copy or distribute others' copyright-protected materials, please ensure that your use of the materials is covered under the University's Fair Dealing Copyright Guidelines available at <https://library.usask.ca/copyright/general-information/fair-dealing-guidelines.php>. For example, posting others' copyright-protected materials on the open web is not covered under the University's Fair Dealing Copyright Guidelines, and doing so requires permission from the copyright holder.

For more information about copyright, please visit <https://library.usask.ca/copyright/index.php> where there is information for students, or contact the University's Copyright Coordinator at [copyright.coordinator@usask.ca](mailto:copyright.coordinator@usask.ca) or 306-966-8817.

## Integrity in a Learning Context

The University of Saskatchewan is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Student Conduct & Appeals section of the University Secretary Website and avoid any behavior that could

potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students should read and be familiar with the Regulations on Academic Student Misconduct (<https://secretariat.usask.ca/student-conduct-appeals/academic-misconduct.php>) as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals (<https://secretariat.usask.ca/student-conduct-appeals/academic-misconduct.php#IXXIIAPPEALS>)

For more information on what academic integrity means for students, see the Academic Integrity section of the University Library website at: <https://library.usask.ca/academic-integrity#AboutAcademicIntegrity>

You are encouraged to complete the Academic Integrity Tutorial to understand the fundamental values of academic integrity and how to be a responsible scholar and member of the USask community - <https://library.usask.ca/academic-integrity.php#AcademicIntegrityTutorial>. As part of the laboratory component, you are required to complete the first tutorial module if you have not done it in previous courses.

## Access and Equity Services (AES) for Students

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Access and Equity Services (AES) if they have not already done so. Students who suspect they may have disabilities should contact AES for advice and referrals at any time. Those students who are registered with AES with mental health disabilities and who anticipate that they may have responses to certain course materials or topics, should discuss course content with their instructors prior to course add / drop dates. In order to access AES programs and supports, students must follow AES policy and procedures. For more information or advice, visit <https://students.usask.ca/health/centres/access-equity-services.php>, or contact AES at 306-966-7273 or [aes@usask.ca](mailto:aes@usask.ca).

Students registered with AES may request alternative arrangements for mid-term and final examinations. Students must arrange such accommodations through AES by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by AES.

For information on AES services and remote learning please visit <https://updates.usask.ca/info/current/accessibility.php#AccessandEquityServices>

## Student Supports

- **Academic Help for Students**

The University Library offers a range of learning and academic support to assist USask undergrad and graduate students. For information on specific services, please see the Learning page on the Library web site <https://library.usask.ca/support/learning.php>

- Study skills materials for online learning <https://libguides.usask.ca/studyskills>
- A guide on netiquette, principles to guide respectful online learning interactions <https://teaching.usask.ca/remote-teaching/netiquette.php>

- **Teaching, Learning and Student Experience**

Teaching, Learning and Student Experience (TLSE) provides developmental and support services and programs to students and the university community. For more information, see the students' web site <http://students.usask.ca>

- **College Supports**

Students in Arts & Science are encouraged to contact the Undergraduate Student Office and/or the Trish Monture Centre for Success with any questions on how to choose a major; understand program requirements; choose courses; develop strategies to improve grades; understand university policies and procedures; overcome personal barriers; initiate pre-career inquiries; and identify career planning resources. Contact information is available at: (<http://artsandscience.usask.ca/undergraduate/advising/>)

- **Financial Support**

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact Student Central (<https://students.usask.ca/student-central.php>).

- **Aboriginal Students' Centre**

The Aboriginal Students' Centre (ASC) is dedicated to supporting Aboriginal student academic and personal success. The centre offers personal, social, cultural and some academic supports to Métis, First Nations, and Inuit students. The centre is also dedicated to intercultural education, bringing Aboriginal and non-Aboriginal students together to learn from, with and about one another in a respectful, inclusive and safe environment. Students are encouraged to visit the ASC's Facebook page (<https://www.facebook.com/aboriginalstudentscentre/>) to learn more.

- **International Student and Study Abroad Centre**

The International Student and Study Abroad Centre (ISSAC) supports student success and facilitates international education experiences at USask and abroad. ISSAC is here to assist all international undergraduate, graduate, exchange and English as a Second Language students in their transition to the University of Saskatchewan and to life in Canada. ISSAC offers advising and support on matters that affect international students and their families and on matters related to studying abroad as University of Saskatchewan students. Please visit <https://students.usask.ca/international/issac.php> for more information.

## **Treaty Acknowledgement**

As we engage in Teaching and Learning, we would like to acknowledge that the Saskatoon campus of the University of Saskatchewan is on Treaty Six Territory and the Homeland of the Métis. We pay our respect to the First Nation and Métis ancestors of this place and reaffirm our relationship with one another. We would also like to recognize that some may be attending this course from other traditional Indigenous lands. We ask that you take a moment to make your own Land Acknowledgement to the peoples of those lands. In doing so, we are actively participating in reconciliation as we navigate our time in this course, learning and supporting each other.