

 Department of Biology

# COURSE SYLLABUS

# COURSE TITLE: BIOL 120.3 – The Nature of Life

# COURSE CODE: 82040 TERM: Winter 2021

# COURSE CREDITS: 3.0 DELIVERY: Lecture & Practicum (Lab)

# CLASS SECTION: 01 START DATE: Thursday, Jan, 11th 2021

# CLASS LOCATION: Remotely

# LAB LOCATION: Remotely

# CLASS TIME: 12:30 to 1:20 pm (M/W/F)

# LAB TIME: 8:30 to 11:20 am (Th); 1:40 to 4:30 pm (M/T/W/Th/F); 5:30 to 8:20 pm (M/T/W)

# WEBSITE: via Canvas

# CATALOGUE DESCRIPTION

An introduction to the underlying fundamental aspects of living systems: covering cell biology, genetics and the evolutionary processes which lead to complex, multi-cellular life forms.

# PREREQUISITE(S)

Biology 30 or BIOL 90 or BIOL 107 or BIOL 108.
**Note:** Chemistry 30 is strongly recommended. Students with credit for BIOL 110 will not receive credit for BIOL 120.

# OVERVIEW OF THE COURSE

This course is designed to introduce you to the vast and exciting field of biology, with a focus on events that are not normally visible to the naked eye. Covering topics in cell biology, genetics and evolution, BIOL 120.3 is one of two foundation courses for biology majors and for students going into Natural Sciences (Program C). BIOL 120.3 also counts towards the biology requirements of a number of programs in different colleges across campus. BIOL 121.3 - The Diversity of Life - is the sister course to BIOL 120.3, and focuses on biological diversity, evolution, adaptations of organisms to specific environments, and the factors influencing changes in biodiversity over time and space.

# REMOTE LEARNING CONTEXT

This year Biol 120 will be delivered entirely remotely. Course material will be prepared and posted to the course management system Canvas in advance of each scheduled lecture. There are NO live lectures. However, **post-lecture and lab quizzes will be delivered synchronously** (see the Course Schedule below).

The recorded materials belong to your instructor and U of S and are copyright protected. In this course, you are permitted to download session videos and materials for your own academic use, but you should not copy, share, or use them for any other purposes without the explicit permission from the instructor.

# ANTICIPATED LEARNING OUTCOMES

By the end of BIOL 120.3, you should be able to describe, classify, and discuss aspects of cell theory, cell division, genetics, bioenergetics, and the molecular basis for variation and natural selection. The laboratory portion of the course will help link these topics together with hands-on exercises. After completing the lab section of the course, you should know how to use a microscope to visualize cells and tissues and how to solve basic genetics problems. Detailed learning objectives for each lecture topic will be posted in Canvas.

# INSTRUCTOR CONTACT INFORMATION

**Lecturers:**

Dr. Manar Angrini Rm 220.2 Collaborative Science Research Building (CSRB)

e-mail: manar.angrini@usask.ca

Dr. Jorge Chedrese Rm 310.1 Collaborative Science Research Building (CSRB)

 e-mail: jorge.chedrese@usask.ca

Dr. Doug Smith Rm 118 Biology Building

 e-mail: dh.smith@usask.ca

Dr. Yangdou Wei

Course Coordinator Rm 220.4 Collaborative Science Research Building (CSRB)

e-mail: yangdou.wei@usask.ca

Mr. Paul Dick, M.Sc. Rm 216 Biology Building

Lab Coordinator e-mail: paul.dick@usask.ca

Mr. James Bush, M.Sc. Rm 118 Biology Building

Coordinator for Mind tap e-mail: james.bush@usask.ca

**Office Hours**: There are no “on campus” office hours this term. A discussion forum, which can be found on the Homepage of the lecture Canvas course, will be available to ask questions of your instructor. To arrange an individual meeting, consult the MEETS tool on Canvas for availability.  Please note that these meetings will be conducted using WebEx; for more information, including how to set up WebEx, see <https://training.usask.ca/webex.php>.  Appointments with your instructor may also be set by email. When doing so, be sure to include the Biol 120 class section number in your subject line.

# INSTRUCTIONAL RESOURCES: TEXTBOOK AND LAB MANUAL

The required textbook for BIOL 120.3 is ***Biology - Exploring the Diversity of Life* (4th Canadian Edition)** by Russell *et al.*, Nelson Education Ltd. This textbook is available from the U of S Bookstore in various formats, which all contain Mindtap and a copy of the e-text. There is a special code required in order to access Mindtap and the e-text, which will be made available early in Term 2 by Mr. James Bush.

 There is a smaller hard-copy version (known as Volume 1), which mostly contains the chapters utilized in BIOL 120.3, alone. The textbook is available in its full length (for students who also plan on taking BIOL 121.3 and/or 224.3).

Note that the textbook will be referred to regularly during lectures both in terms of content and for the use of visual aids. It is also helpful for reviewing the material. The textbook material that you are responsible for is outlined on the second-last page of this syllabus and will be the core testable material for the course. The lectures are intended to highlight and reinforce key concepts. Please see the *Learning Objectives Summary*, which will be posted on Canvas with this outline, for a more detailed description of the topics you will be responsible for on the lecture/lab quizzes, and midterm and final exams. All regular sections of the course will have common midterm and final exams.

The BIOL 120.3 Lab Manual (2020-21 Edition) is required for the course. It is available for purchase through the U of S Bookstore.

# ONLINE RESOURCES

There are a number of online resources to help support your learning in BIOL 120.3. We highly recommend the use of these resources as a means to help increase your performance and success in this course.

Canvas (https://canvas.usask.ca/courses/9642) is where you will be able to access the course’s detailed Learning Objectives, recorded video lectures, lecture notes (at the discretion of each instructor), and any other resources.

When purchasing a copy of the textbook from the U of S Bookstore, the individual student also receives access to an online platform termed Mindtap. This platform provides access to a digital copy of the textbook, and to other resources like animations and self-tests. Note that the Mindtap platform **will *not* be** used for any mandatory, online quizzes in BIOL 120.

# STRUCTURED STUDY SESSIONS (STUDENT LEARNING SERVICES)

BIOL 120 Structured Study Sessions are weekly \*peer-led study sessions that run throughout the term. These regularly scheduled study sessions give you the opportunity to review and complete exercises on the course material, revisit more difficult concepts, and prepare for the midterm and final exams.

All BIOL 120 students are welcome to attend structured study sessions. Pre-registration is not required and attendance is free. All that you need to do is show up to the session at the scheduled time and location and be open to learning! Sessions will be held online, mainly via Webex. For more information, including the schedule of sessions, watch your course Canvas site or visit <http://library.usask.ca/sss>.

\*Note: Experienced students who have already completed BIOL 120.3, and achieved an excellent grade run the structured Study Sessions. Research has shown that students, who attend Structured Study Sessions, on average, achieve higher grades than those who do not.

# STUDENT REVIEW AND COURSE PREPARATION (PURPLE PAGES)

**There is prerequisite material that will not be covered directly in lectures.** This material is expected knowledge from high school courses. Students should review this information ahead of time because it is important for the understanding of many basic biological topics we will cover.

In Russell *et al.*, you will find this section near the middle of the book denoted by the purple colouring (pgs. F1-44) – for that reason, these are known as “The Purple Pages”. This section contains basic information about the chemical and physical foundations of Biology, as well as a review of the macromolecules that make up living things (proteins, nucleic acids, carbohydrates and lipids). Knowledge of much of this information will be needed to understand course content and answer questions on the lab quizzes, and the lecture midterm and final exams.

# EVALUATION

The final course grade is calculated as follows:

**Post Lecture Quizzes 20%**

**Lab Quizzes and Assignments 20%**

**Lecture & Lab Midterms 20%**

**Lecture & Lab Final Exam 40%**

**Total 100%**

**Learning Assessment Details:**

**Post Lecture Quizzes**: These are comprised of **4 post-lecture quizzes** over the course of the term. These quizzes are designed to assess a student’s knowledge and understanding of the material from the previous lecture topics. Each quiz consists of multiple-choice questions delivered and submitted online through Canvas. The quiz will be taken individually via Canvas during the last 20 minutes of the last lecture of the assigned week (i.e. Friday at 1:00 PM). For the quiz dates, please consult the course outline at the end of this syllabus.

**Lab Quizzes:** There are **3** **lab** **quizzes** to be completed individually via Canvas within the scheduled lab session time and are each worth 3.25% of the course grade. Question format and scope will be provided prior to each quiz.

**Lab** **Assignments:** Each of the 7 labs include a series of **worksheets** that must be submitted for a completion mark. These are together worth 7% of the course grade and are due 24 hours after the **start time** of the associated lab.

A short **research assignment** worth 3.25% of the course grade will be due during the last (review) lab of the term. This assignment requires researching a use of modern biotechnology and preparing a short summary. Details will be provided during the term.

Consult the 2020-21 Lab Manual for the procedure to follow for missed labs or Lab quizzes and assignments.

**Lecture & Lab Midterm Exams:** This course includes 2 midterm examinations delivered and completed online through Canvas. Each midterm is taken individually via Canvas and is designed to assess students’ knowledge and understanding of the core concepts of the lecture and the lab. The first midterm exam covers the material from the first part of the course while the second midterm covers the material from the second part of the course. Each midterm will begin with 25 multiple-choice questions covering the lecture content, followed by short and/or long answer questions covering the lab content. The total time of each exam is 90 minutes, of which 30 minutes is intended for the lecture portion and 60 minutes for the lab portion. Each exam will be available via Canvas for the duration of the exam time, which will be held outside of class/lab time. Midterm 1 will be held on **Wednesday, February 10th at 5:00 PM,** and Midterm 2 will be held on **Wednesday, March 17th at 5:00 PM.**

In the event that you have a legitimate U of S timetabling conflict, you must contact your instructor right away in order to make arrangements for an alternate date for you to write a Deferred Midterm Exam. If you are absent from the midterm exam due to a medical emergency or another exceptional circumstance, you must advise your instructor within THREE WORKING DAYS of the missed exam providing explanatory documentation to initiate a discussion about whether you qualify for a Deferred Lecture/Lab Midterm Exam. If you do not advise your instructor within three working days, or do not have an acceptable excuse, a grade of zero will be assigned for the Lecture/Lab Midterm Exam.

**Lecture & Lab Final Exam:** This is a cumulative examination taken individually via Canvas designed to assess student’s knowledge and understanding of the core concepts covered throughout the entire course. The final exam will begin with 50 multiple-choice questions covering the lecture content, followed by short and/or long answer questions covering the lab content. The duration of the exam is 150 minutes, of which 60 minutes is intended for the lecture portion and 90 minutes for the lab portion.

Consult the Final Exam Schedule when it is released for the examination date and time. The Final Exam will be scheduled by the Registrar’s Office to take place within the exam period of
April. 14 - 30, 2021.

Accommodations will not be made for students making travel arrangements during this time frame. If a student is absent from the Final Lecture Exam for a legitimate reason, within **THREE WORKING DAYS** of the missed exam, the student may apply for consideration of a Deferred Final Lecture Exam to the Dean’s Office of the College in which the student is registered. Students are encouraged to review all University examination policies and procedures: <http://policies.usask.ca/policies/academic-affairs/academic-courses.php>.

# IMPORTANT ACADEMIC DATES

Friday, Jan. 22nd – Last day to withdraw from Term 2 (Winter) classes with 100% tuition credit.

Friday, Jan. 29th – Last day to withdraw from Term 2 (Winter) classes with 75% tuition credit.

Friday, Feb. 5th – Last day to withdraw from Term 2 (Winter) classes with 50% tuition credit.

Wednesday, Apr. 7th – Last day to withdraw from Term 2 (Winter) classes.

# LABORATORIES

Labs begin in the week of January 18th, 2021. PAWS registration will give you a time and day of the week for your lab section and the general lab schedule is provided on the final page of this syllabus. The content for each lab will be made available on Canvas **six days** before the scheduled lab. Unless otherwise specified (ex. quizzes), all lab activities can be completed at any time within the following week (i.e. six days prior to the scheduled lab time until 24 hours after).

The 2020-21 edition of the Lab Manual for Biology 120.3 is **required for all labs**. A device capable of capturing digital photographs (ex. smartphone camera, webcam, digital camera) will also be required. Students are expected to participate in and complete all lab activities and assignments. Any other questions regarding the lab should be directed to the Lab Coordinator.

# STUDENTS WRITING EXAMINATIONS WITH ACCESS AND EQUITY SERVICES (AES)

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.

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>

# 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)](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**](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 available at <https://library.usask.ca/copyright/students/rights.php>, or contact the University’s Copyright Coordinator at mailto:copyright.coordinator@usask.ca or 306-966-8817.

# RECORDING OF THE COURSE

Please remember that course recordings belong to your instructor and the University 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>.

# INTEGRITY IN A REMOTE LEARNING CONTEXT (from the Office of the University Secretary)

Although the face of teaching and learning has changed due to covid-19, the rules and principles governing academic integrity remain the same. If you ever have questions about what may or may not be permitted, ask your instructor. Students have found it especially important to clarify rules related to exams administered remotely and to follow these carefully and completely.

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>

# STUDENT SUPPORT

## **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>.

Remote learning support information <https://students.usask.ca/remote-learning/index.php>

Class and study tips <https://students.usask.ca/remote-learning/class-and-study-tips.php>

Remote learning tutorial <https://libguides.usask.ca/remote_learning>

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>.

## **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 [students.usask.ca](http://students.usask.ca/) or [updates.usask.ca](https://updates.usask.ca/) for more information.

## **Recommended Technology for Remote Learning**

Students are reminded of the importance of having the appropriate technology for remote learning. The list of recommendations can be found at <https://students.usask.ca/remote-learning/tech-requirements.php>.

# LECTURE CONTENTS

Please note: Materials in the following sections from the textbook by Russell *et al.* constitute all of the testable material for the lecture exams. The lecture presentations are meant to highlight and synthesize essential concepts, and to provide opportunities for class discussion and interaction.

Chapters and sections in the **4th Cdn. Edn. - Russell et al: *Biology – Exploring the Diversity of Life***

Chapter 2 – The Cell: an Overview – §2–2.5c

Chapter 4 – Cell Membranes Structure and Function – §4–4.6b

Chapter 7 – Cell Cycles – §7–7.4b

Chapter 8 – Genetic Recombination (Meiosis) and Life Cycles – §8.3a-d

Chapter 21 – Defining Life and its Origins – §21–21.5d, 21.6c, 21.7b,c

Chapter 9 – The Chromosome Basis of Mendelian Inheritance – §9–9.2f

Chapter 10 – Genetic Linkage, Sex Linkage, and Other Non-Mendelian Inheritance Mechanisms

 – §10–10.2d, 10.4a-d

Chapter 11 – DNA Structure, Replication, and Repair – §11–11.3h

Chapter 12 – Gene Structure, Expression, and Mutation – §12–12.5a

Chapter 3 – Energy and Enzymes – §3–3.5d, 3.6a, 3.6d

Chapter 5 – Cellular Respiration – §5–5.7d

Chapter 6 – Photosynthesis – §6–6.4c

# LECTURE AND LAB SCHEDULE FOR BIOL 120.3 (January – April 2021)

 **Lecture Topic Lab Topic Assessment**

**Week 1** Introduction, Microscopy NO LAB

Jan. 11 – 15 Angrini

**Week 2** Cell Biology 1. Introduction,

Jan. 18 – 22Angrini Microscopy

**Week 3** Cell Biology Cont’d 2. Eukaryotic Cell Lecture Quiz 1

Jan. 25 – 29 Angrini Structure & Function

**Week 4** Cell Membrane 3. Osmosis & Lab Quiz 1

Feb. 1 – 5 and Functions, Cell division

 Cell Cycle

 Chedrese

**Week 5** Mitosis, Meiosis NO LAB Midterm 1

Feb. 8 – 12 Chedrese Feb. 10, 5:00 PM

**Week 6** **Midterm Break (No Lectures or Labs)**

Feb. 15 – 19

**Week 7** Meiosis, 4. Sexual Life Cycles Lecture Quiz 2

Feb. 22 – 26 Origin of Life & Meiosis

 Chedrese

**Week 8** Mendelian and5. Introduction to Lab Quiz 2

Mar. 1 – 5 Chromosomal Genetics Genetics

 Human Genetics

 Smith

**Week 9** DNA Structure & 6. Human Genetics Lecture Quiz 3

Mar. 8 – 12 Replication & Gene Linkage

 Smith Lab Quiz 3

**Week 10** Gene expression - NO LAB Midterm 2

Mar. 15 – 19Transcription Mar. 17, 5:00 PM

 Smith

**Week 11** Gene expression - NO LAB

Mar. 22 – 26 Translation

 Smith

**Week 12** Energy, Metabolism 7. Biotechnology –

Mar. 29 – Apr. 2 Enzymes Techniques &

 Wei Applications

**Week 13** Cellular Respiration, Lab Review Research Assignment

Apr. 5 – 7 Photosynthesis Due

 Wei

**Week 14** Photosynthesis, Review NO LAB Lecture Quiz 4

Apr. 12 – 14 Wei

 Class Review

 Angrini/Chedrese/Smith/Wei

# FINAL LECTURE EXAM SCHEDULE: Apr. 14 – 30, 2021

The date and location of the BIOL 120.3 Final Lecture Exam will be announced by the Registrar’s Office.