

Course Syllabus – BIOL 2103 – Evolution

Instructors:	René Malenfant	Lecture:	MWF: 11:30–12:20 (B146)
Email:	rene.malenfant@unb.ca	Office Hours:	By appointment

How to Contact Me

I want to ensure that I am available to answer your questions, to provide useful feedback, and to connect when needed.

- If you have comments or questions about our course, please feel free to email me at the email addresses above.
- If you wish, we can arrange a time to meet so that we can address whatever questions or issues you have as efficiently as possible.
- Please do not try to contact me any other way than email. I will not be checking other avenues, and I don't want your message to get lost.

Barring other commitments, replies to email questions will usually be prompt during the workweek (i.e., Monday–Friday, 9:00 AM to 5:00 PM), and much more slowly (or perhaps not at all) afterhours or on the weekend.

About the Course

Course Description:

An introduction to evolutionary theory explaining biological unity and diversity, from pre-Darwinian ideas to current issues in evolutionary biology. Theoretical and empirical studies are integrated to elucidate evolutionary processes and outcomes. Upon course completion, students will be able to summarize the evidence supporting evolutionary theory and its historical development, describe mechanisms of evolutionary change above and below the species level, and explain the evolution of common life histories and behaviours.

Course Prerequisites:

BIOL 1001 or BIOL 1009, BIOL 1006, BIOL 1012 or BIOL 1019, BIOL 1017.

Co-requisite: BIOL 2053.

Recommended Textbook:

Freeman, S., & Herron, J.C. 2013. *Evolutionary Analysis*, 5th ed. Pearson: New York, NY.
[The 4th edition of this textbook is also adequate.]

Other Useful Resources:

Losos, J.B. (ed.) 2014. *The Princeton Guide to Evolution*. Princeton University Press: Princeton, NJ. [An electronic version is available online at: <https://unb.on.worldcat.org/oclc/861200134>]

Recommended non-textbook readings, such as scientific papers will be available via Desire2Learn (Brightspace), UNB's online Learning Management System.

Course Topics and Outcomes:

Major course topics include:

- The history of the evolutionary thinking (before, including, and since Darwin)
- Forces of evolution (i.e., mutation, selection, genetic drift, gene flow)
- Selection as the cause of adaptations (i.e., natural, sexual, and kin selection)
- Speciation (e.g., species concepts, modes of speciation)

Upon completion of this course, you will be able to:

- Describe the evidence for evolution and critically analyse misconceptions in evolutionary thinking.
- Trace the development of evolutionary thought, from pre-Darwinian ideas to modern theories, including key figures and concepts.
- Understand Charles Darwin's theories of descent with modification and natural selection and their transformative impacts on Biology.
- Apply the Hardy–Weinberg principle to predict genotype frequencies in populations and understand its assumptions and limitations.

- Explain the mechanisms of evolutionary change, including mutation, natural selection, genetic drift, and gene flow, and their effects on genetic variation.
- Distinguish between different forms of selection, such as sexual and kin selection, and their roles in adaptation.
- Explain various species concepts and the processes involved in speciation, including mechanisms of reproductive isolation.
- Explain the evolution of life history strategies, behaviors, and co-evolutionary relationships.
- Apply evolutionary principles to interpret real-world biological phenomena and contemporary issues.

Students' competency levels on these outcomes may vary. Outcomes achievement requires the meeting of all course expectations, including honouring of all course policies, regular class attendance, and completion of all assigned work in good faith and on time.

Grading, Marks, and Course Policies

Grading Scale

Letter Grade	Percentage Grade	Grade Points
A+	[93–100%]	4.3
A	[85–93%]	4.0 (Excellent)
A–	[80–85%]	3.7
B+	[75–80%]	3.3
B	[70–75%]	3.0 (Good)
B–	[65–70%]	2.7
C+	[60–65%]	2.3
C	[55–60%]	2.0 (Satisfactory)
D	[50–55%]	1.0
F	[0–50%]	0.0

Course Marking Scheme

Item	Value	Date	Details
Quizzes (×3)	15% (5% each)	See below	Multiple choice, short answer, etc. (D2L)
Midterm 1	20%	See below	Written (in class)
Midterm 2	25%	See below	Written (in class)
Final exam	40%	TBA	Written (exam period)
Total:	100%		

Course Policies:

- Please consult UNB's regulations regarding class attendance and decorum: <http://go.unb.ca/tls1viWva> and <http://go.unb.ca/tlsmWzKLL>
- Requests to write an evaluation prior to the scheduled date will not be granted. In extenuating circumstances (e.g., illness), a student's evaluation may be rescheduled after the regularly scheduled date. The format of deferred evaluations may differ from those used during the original dates.
- Please bring a calculator (that you know how to use) to midterms and to the final exam.
- Mobile devices are to be turned off during lectures. Anyone who wishes to video or audio record lecture presentations or distribute course notes or other similar materials provided by instructors must obtain the instructor's written consent beforehand. Otherwise, all such reproduction is an infringement of copyright and is absolutely prohibited and subject to academic penalties (see Academic Offences below). Classes may be recorded by students with documented disabilities for personal and private use.
- In the case of campus closure (e.g., storm day), a recorded lecture may be posted to D2L in lieu of the live lecture.
- Extra credit for additional work will not be granted.

Lecture Schedule

The intended schedule is found below. It is subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better student learning. Students will be notified if and when changes are made (stay up-to-date via D2L Brightspace).

Date	Day	Topic	Evaluations
Jan. 6	M	Introduction	
Jan. 8	W	History of evolutionary theory 1	
Jan. 10	F	History of evolutionary theory 2	
Jan. 13	M	History of evolutionary theory 3	
Jan. 15	W	Evidence of evolution 1	
Jan. 17	F	Evidence of evolution 2	
Jan. 20	M	The age of the earth; fossilization	
Jan. 22	W	The tree of life	
Jan. 24	F	Introduction to natural selection	
Jan. 27	M	Mutation & variation 1	Quiz #1 (on D2L; 12:00pm–11:59pm)
Jan. 29	W	Mutation & variation 2	
Jan. 31	F	Hardy–Weinberg equilibrium	
Feb. 3	M	Genetical theory of natural selection 1	
Feb. 5	W	Genetical theory of natural selection 2	
Feb. 7	F	Drift, migration & non-random mating 1	
Feb. 10	M	Drift, migration & non-random mating 2	
Feb. 12	W	<i>N/A – Midterm</i>	Midterm #1 (in class)
Feb. 14	F	Linkage and linkage disequilibrium 1	
Feb. 17	M	<i>Family Day – no class</i>	
Feb. 19	W	Linkage and linkage disequilibrium 2	
Feb. 21	F	Quantitative genetics & phenotypic evolution 1	
Feb. 24	M	Quantitative genetics & phenotypic evolution 2	
Feb. 26	W	Sex and sexual selection 1	
Feb. 28	F	Sex and sexual selection 2	
Mar. 3	M	<i>Reading Week – no class</i>	
Mar. 5	W	<i>Reading Week – no class</i>	
Mar. 7	F	<i>Reading Week – no class</i>	
Mar. 10	M	Evolution of social behaviour 1	Quiz #2 (on D2L; 12:00pm–11:59pm)
Mar. 12	W	Evolution of social behaviour 2	
Mar. 14	F	Evolution of life-history strategies	
Mar. 17	M	Species concepts & speciation 1	
Mar. 19	W	Species concepts & speciation 2	
Mar. 21	F	Macroevolution 1	
Mar. 24	M	Macroevolution 2	
Mar. 26	W	<i>N/A – Midterm</i>	Midterm #2 (in class)
Mar. 28	F	Evolution and development 1	
Mar. 31	M	Evolution and development 2	
Apr. 2	W	Coevolution 1	
Apr. 4	F	Coevolution 2	
Apr. 7	M	TBA	Quiz #3 (on D2L; 12:00pm–11:59pm)
Apr. 9	W	Review	

Student Support Information

D2L

Online course materials can be found in D2L Brightspace, UNB's online Learning Management System. You can access it through the MyUNB portal for single login to all UNB services (<https://my.unb.ca/Pages/default.aspx>) or directly at <https://lms.unb.ca/>.

D2L Brightspace Support for Students:

<https://unbcloud.sharepoint.com/sites/adm/SitePages/D2L-Resources-for-Students.aspx>

For D2L technical support, contact: d2l@unb.ca

Key Technologies

During the semester, there are a variety of technologies that students may be expected to use. Students can contact their course instructor or Information Technology Services (ITS) Help Desk (its servicedesk@unb.ca).

Libraries

UNB Libraries supports your learning and academic success. Librarians will help you navigate academic resources and guide you through your research and information needs. Examples of this support include finding reliable sources for your assignments, searching scholarly databases, and offering advice on the quality of your research. A vast collection of resources is available to you online and in print at lib.unb.ca. Research help is available by phone, e-mail, chat, and in-person. See: www.lib.unb.ca

The libraries offer quiet and group study space. Book a Group Study Room online at:

http://www.lib.unb.ca/services/group_study.php

Tatiana Zaraiskaya is the STEM librarian for the Faculty of Science and the Faculty of Forestry & Environmental Management. Tatiana is available to meet one-on-one, online or in person.

Contact information and research guides by subject: <https://lib.unb.ca/profile/tatiana-zaraiskaya>

Services for Students with Disabilities

If you are a student with a disability of any type (physical, mental, learning, medical, chronic health, sensory; visible or invisible) you are strongly encouraged to register with the UNBF Student Accessibility Centre (SAC) (<https://www.unb.ca/fredericton/studentservices/academic-success/accessibility-centre/>) so that you may receive appropriate services and accommodations. Once you are registered with SAC, you'll receive an accommodation letter you can share with instructors. If you would like to discuss your needs with the instructor, please book a time for a confidential appointment.

Student Services Writing and Study Skills Support

The UNB Writing and Study Skills Centre provides many coaching and mentoring services to assist with writing papers, effective study methods, and other skills development related to student success: <http://www.unb.ca/fredericton/studentservices/academics/writing-centre/index.html>

Student Services Learning Strategist Support

Any UNB student wanting to improve their academic skills may book appointments with the Learning Strategist. The Strategist offers instruction on topics such as: “learning how to learn” strategies, memory techniques, time management skills, test preparation and test taking methods, note-taking, and other learning and study skills.

<https://www.unb.ca/fredericton/studentservices/academic-success/accessibility-centre/services-and-support.html>

Math Skills Support

UNB's Math Learning Centre offers math help drop-in times and opportunity to book appointments: <https://www.unbsu.ca/math-learning-centre>

Technical Support

Information Technology Services (ITS) Help Desk can be reached by phone 457-2222, email - its servicedesk@unb.ca, or visited in person at the Harriet Irving Library Learning Commons. <http://www.unb.ca/its/get-it-help.html>

Student Wellbeing

It is normal for university students to experience mental and physical health challenges. If you or a friend encounter difficulties and need assistance, it's important to reach out. Consider discussing the situation with a mentor or academic advisor. Learn about resources that assist with wellness and academic success at the University of New Brunswick by visiting:

<https://www.unb.ca/fredericton/studentservices/be-healthy-at-unb.html>

If you are in immediate crisis, please contact CHIMO helpline at 1-800-667-5005.

Plagiarism and Academic Offences

The university has carefully defined what it considers plagiarism, and these regulations are found in the UNB Undergraduate Calendar, Section B University-Wide Academic Regulations, VIII Academic Offences, or visit: <http://go.unb.ca/tlsPb0XX5>. It is the student's responsibility to know the regulations.

Plagiarism includes:

1. quoting verbatim or almost verbatim from any source, regardless of format, without acknowledgement;
2. adopting someone else's line of thought, argument, arrangement, or supporting evidence (such as, statistics, bibliographies, etc.) without indicating such dependence;
3. submitting someone else's work, in whatever form (essay, film, workbook, artwork, computer materials, etc.) without acknowledgement;
4. knowingly representing as one's own work any idea of another.

NOTE: In courses which include group work, a penalty may be imposed on all members of the group unless an act of plagiarism is identified clearly with an individual student or students. Also, please note that plagiarism is not difficult to spot; web sources can be quickly traced through a variety of specialty search engines. Professors are required to follow the disciplinary procedures outlined in the Calendar (see link above).

OTHER ACADEMIC OFFENCES you need to be aware of include:

1. Cheating on examinations, tests, assignments or reports, including but not limited to:
Impersonating a candidate at an examination or test or in connection with any assignment in a course or availing oneself of the results of impersonation.
Obtaining, through theft, bribery, collusion, purchase, or other improper manner,
(i) an examination or test paper prior to the date and time for writing the examination or test;
(ii) academic materials belonging to another person, e.g., laboratory reports, assignments, papers, computer materials, datasets.
2. Falsifying or knowingly submitting false assignments or credentials, records, transcripts, or other academic documents.
3. Submitting a false health or other certificate.
4. Submitting identical or substantially similar work for one course or program of study, which has been or is being submitted for another course or program of study, without the prior express knowledge and approval of the instructors.
5. Interfering with the right of other students to pursue their studies.
6. Knowingly aiding or abetting any of the above offences.

7. Tampering with, or altering, in any deceptive way, work subsequently presented for a review of the grade awarded.

Penalties for plagiarism and other academic offences range from a minimum of F (zero) in the assignment, exam or test to a maximum of suspension or expulsion from the University, plus a notation of the academic offence on the student's transcript.

Statement on Generative AI

Students are encouraged to use generative artificial intelligence (AI) throughout this course in whatever way enhances their learning. Use of generative AI must be acknowledged in any evaluation in which it has been used. You must describe both the program you used (e.g., ChatGPT 4) and the purpose for which you used it (e.g., brainstorming, making revisions to your writing). Regardless of whether you use generative AI, you are entirely responsible for the content of the work you submit, including any errors committed by the AI.