
BIOL 315

Plants & Human Culture

Fall Term 2017-18

CALENDAR DESCRIPTION

Human civilization depends on plants. We have changed them and they have changed us. This course investigates the biology and evolution of valuable economic plants, the science of plant domestication and genetic manipulation, and how our interactions with plants have altered the economy, politics, and sociology of human cultures.

LEARNING HOURS 120 (36L;24O;60P)

PREREQUISITE BIOL 102/3.0 and BIOL 103/3.0 and BIOL 201/3.0.

SCHEDULE

Lectures: Mondays 9:30am, Wednesday 8:30am & Thursdays 10:30am in Kingston Hall room 200

Instructor	Dr. Chris Eckert
Instructor Contact	(613) 533 6158 or via OnQ forum
Office Hours	Wednesdays 330-530pm or by appointment (phone)
TAs:	Regan Cross
TA Office Hours	None

Learning Objectives

Plants are the foundation of life on Earth. Humans, in particular have evolved in very close association with flowering plants. They have altered our genetic and cultural evolution and we have altered theirs. This course explores and intimate and dynamic relations between plants and humans. In addition to discussing the biology and evolution of many of our most valuable economic plants, and delving into the science of plant culture, domestication and genetic manipulation, we consider how plants have altered the economy, politics and sociology of human cultures. We will also explore a variety of current and controversial issues involving our use of plants. Students in this course will come away with a clearer understanding of why plants are incredibly cool, why they do things that are beneficial to us, and the ecological and social impacts of how we use them. As a student in Biology 315 you will use agricultural and culturally significant plants as a vehicle for advanced training in fundamental Mendelian genetics, quantitative genetics, genomics, biotechnology, ecology, evolution and quantitative skills. As overarching goals, we hope to promote critical thinking about scientific endeavours and improve your comprehension and writing skills. To these ends the course uses a mixture of lectures, readings, class discussions, written & illustrated projects and exams. By the end of this course, you should have:

- A broad perspective on plant-human coevolution.
- Specific knowledge of the plant species that have shaped human civilization.
- A clear understanding of evolutionary principles that can be applied broadly to agriculture, resource management and biotechnology.

- An appreciation for how quantitative genetic and leading-edge genomic analyses can be applied to understand plant evolution and crop plant development.
- An informed opinion about the most controversial issues surrounding the evolution, genetic modification, cultural significance and health effects of utilitarian plants.
- Improved research, writing and scientific illustration skills.
- A better understanding of the current and potential role of plants in your personal life, which may be manifested as a strong desire to bake bread, brew beer and/or start a garden.

Learning Hours

<i>Teaching method</i>		<i>Average hours per week</i>	<i>Number of weeks</i>	<i>Total hours</i>
In-class hours	Lecture	3	12	36
	Seminar			
	Laboratory			
	Tutorial			
	Practicum			
	Group learning			
	Individual instruction			
Other	Online activity	3	12	36
	Off-campus activity			
	Private study	4	12	48
Total hours on task				120

Course Outline: Main Topics

- What plants do for humans
- Ecological and evolutionary origins of agriculture
- Plant domestication & breeding
- Genomic analysis of domestication history and important agricultural traits
- Darwinian agriculture
- Evolution & dominance of cereals
- Wheatbelly & other fad diets
- Evolutionary diversity in rice
- Many facets of maize
- Genetically modified organisms & the controversy surrounding them
- Other key crops (legumes, leaf crops, tomatoes & other fruits)
- The enigma & many uses of the African bottle gourd
- The Mighty Brassicaceae and their effects on human health
- Sugar and its not so sweet history & legacy
- Inebriants & stimulants
- Psychoactive drugs and their social significance
- Biology & social significance of psychoactive drugs
- Wood & its many cultural impacts

Textbooks/Readings

There is no textbook for the course. Assigned and recommended readings vary from year to year and are available via OnQ

Grading Scheme

Component	Weight	Due dates
“Plants in My Life” assignment	5%	Thurs 28 Sept 2017
Online quizzes (6)	9%	Throughout the course at regular intervals
Discussion questions (6)	6%	Throughout the course at regular intervals
Online poster	20% Group poster 5% Contribution to group poster 5% Grading 5 other posters	Mon 13 Nov 2017 Mon 20 Nov 2017 Mon 20 Nov 2017
Midterm exams (held in lecture)	10% First midterm 15% Second midterm	Thurs 5 Oct 2017 Thurs 2 Nov 2017
Final exam	25%	TBA (during final exam period in Dec 2017)

Late Policy

Online quizzes must be completed by the due date posted on OnQ. Group posters will be submitted by the due date posted on OnQ, with late submissions losing 10% per 24 hours (or part of) that they are overdue.

Grading Method

Exams, online quizzes, discussion questions, the “plants in my life” assignment, group project contribution and peer grading will be graded using numerical percentage marks. Poster will receive letter grades, which will be translated into numerical equivalents for calculating the grade average using the Faculty of Arts and Science Letter Grade Input Scheme. The following scale will be:

Arts & Science Letter Grade Input Scheme

Assignment mark	Numerical value for calculation of final mark
A+	93
A	87
A-	82
B+	78
B	75
B-	72
C+	68
C	65
C-	62
D+	58
D	55
D-	52
F48 (F+)	48
F24 (F)	24
F0 (0)	0

Your course average will then be converted to a final 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 Integrity and Queen's Code of Conduct

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments and conduct conform to the principles of academic integrity. Information is available in the Arts and Science Calendar (see Academic Regulation 1 - <http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations>, on the Arts and Science website (see <http://www.queensu.ca/artsci/academics/undergraduate/academic-integrity>), and at Biology's website (<http://www.queensu.ca/biology/undergrad/integrity.html>) and from the instructor of this course.

Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery and falsification, and are antithetical to the development of an academic community at Queen's. Given the seriousness of these matters, actions which contravene the regulations on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

Accommodation Policy, Exam Conflicts, and Other Conflicts

Students who feel they need accommodations for disabilities or extenuating circumstances, or have a conflict between exams or other commitments should consult the Biology Department's website for details about how to proceed (<http://www.queensu.ca/biology/undergrad/integrity.html>). In general, the earlier a course coordinator is apprised of an extenuating circumstance, the more likely an accommodation can be made. Students are encouraged to be proactive in anticipating difficulties, when it is possible to do so.

Students may apply to write a make-up or deferred exam if they have an exam conflict as defined in the Academic Regulations of the Faculty (See Arts and Science Calendar Regulation 8 - <http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations>). In this case, the student should report to the Exams Office first to verify that there is a genuine exam conflict. Biology professors will not consider your situation to be a conflict unless it meets the criteria set out by the Faculty of Arts and Sciences. Students may request a make-up or deferred exam if they have an exam conflict with

off-campus travel associated with a field course (e.g BIOL-307/3.0 or 407/3.0) that is held during the fall or winter terms.

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Accommodation of Disabilities

Queen's University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact the Disability Services Office (DSO) and register as early as possible. For more information, including important deadlines, please visit the DSO website at: <http://www.queensu.ca/hcnds/ds/>

Biology 315 ~ tentative lecture schedule (last updated 05 September 2017)

The lecture schedule will evolve as we go, so I'll send updates. The timing of the assessment items in red text are firm and will not change. I've indicated the approximate date that each of the 7 readings (R1-7) will be posted and what lecture it will be discussed during and whether that reading is subject to a quiz or will form the basis of discussion questions (Q1-6). These dates (in black text) may change if the schedule of lectures shifts.

Week	Lectures	Readings	Assessments
1: 11–15 Sept	L1) What plants do for humans L2) Studying agricultural origins L3) The rise of Agriculture	R1 posted (L7)	Plants in My Life (PIML) posted (Mon 1130pm)
2: 18–22 Sept	L4) Domestication genetics L5) Retrospective genetics	R2 posted (L10)	Quiz#1(R1) (Sun 1130pm)
3: 25–29 Sept	L6) Darwinian agriculture (R1Q1) L7) Genetic modification L8) Wheat		Questions#1(R1) (Monday at start of lecture) PIML due (Thurs 1130pm) Quiz#2(R2) (Sun 1130pm)
4: 2–6 Oct	L9) Effects of diet on health (R2Q2) Wed = Review Session Thurs: Midterm exam #1	R3 posted (L13)	Questions#2(R2) (Mon lect)
5: 9–13 Oct	Mon = Thanksgiving L10) Other cereals	R4 posted	Quiz#3(R3) (Fri 1130pm) Poster assignment posted

	L11) Rice		
6: 16–20 Oct	L12) Maize L13) GMOs (R3Q3) L14) Legumes	R5 posted (L18)	Questions#3(R3) (Wed lect) Quiz#4 (R4) (Fri 1130pm)
7: 23–27 Oct	L15) Fruits L16) Tomatoes L17) Leaf & stem crops: Brassicas L18) Vegetarianism (R5Q4)		Questions#4(R5) (Thurs lect)
8: 30 Oct – 3 Nov	Mon = Review session Wed: Midterm exam #2 L19) Below-ground crops	R6 posted (L22)	
9: 6–10 Nov	L20) Sweet of sweetness L21) Sour of sweetness L22) The African bottle gourd (R6)	R7 posted (L25)	Quiz#5(R6) (Wed 1130pm)
10: 13–17 Nov	L23) Inebriation L24) Stimulation L25) Organic food? (R7Q5)	R8 posted (L28)	Posters due (Mon 1130pm) Poster evaluation assignment posted Questions#5(R7) (Thurs lect)
11: 20–24 Nov	L26) TBA L27) Psychoactive drugs L28) Legalize it?? (R8Q6)	R9 posted (L31)	Poster evaluations due (Mon 1155pm) Questions#6(R8) (Thurs lect)
12: 27 Nov – 1 Dec	L29) Wood 1 L30) Wood 2 L31) Tonewoods (R9)		Quiz#6 (R9) (Wed 1130pm)
Final exam period	TBA: Evening review session TBA: final exam		