DALHOUSIE UNIVERSITY

Faculty of Science and Faculty of Graduate Studies Course Syllabus
Department of Biology

MARI 3604.03 – BIOL 5604.03

Field Aquaculture

Summer 2022, SEASIDE
(April 28 to May 13, 2022)

Instructor: Dr. Diego Ibarra | email: Diego.Ibarra@dal.ca | Office: LSC-3625 (Oceanography)
Questions MUST be posted in Brightspace's Discussion boards (see guidelines below). Only use email for private/personal matters.

TA: Maggie Macleod | email: mr207447@dal.ca

Time zone: All times (syllabus, Brightspace, calendar, etc.) are in **Atlantic Daylight Time (ADT, UTC-3)**
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Course Description

This course teaches students aquaculture techniques through online "virtual field trips" to several aquaculture facilities in the Maritimes and around the World (e.g. farms, hatcheries, etc.). The "virtual field trips" consist of online video-calls with aquaculture farmers, where students can ask questions in real-time, but also include curated PowerPoint presentations with photos and videos.

This course also has hands-on labs including a Transport Canada Certification (Small Domestic Vessel Basic Safety) from Survival Systems Training Limited (Dartmouth); an aquaculture net mending course in Rainbow Net and Rigging Limited (Dartmouth); a boat driving lab (Northwest Arm); an Aquaculture Instrumentation Workshop/Lab (Innovasea and Hoskin Scientific) and a knots and ropes lab .

Course Prerequisites:

Undergraduate	Graduate
BIOL 2003.03 – Animal Diversity **OR** Instructor's approval	Instructor's approval
Recommended: MARI 3602.03 Introduction to Aquaculture	

Key knowledge or skills expected of students coming into the course
- Students should be familiar with the basic concepts of aquaculture and the diversity of animal life.

Course Goals and Outcomes
- Describe aquaculture techniques, methods and processes employed in the Maritime provinces of Canada
- Compare techniques used in the research and culturing of shellfish and finfish species
- Describe skills used in the cleaning and processing of aquaculture species
- Recognize techniques for assessment and monitoring of water quality

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Course Materials

Class notes: Class notes are posted on BrightSpace.

OneDrive: Photos, videos and other documents will also be posted in a OneDrive folder (link to folder is in Brightspace). This folder also will be used to back up your work.

Announcements: Electronic announcements and additional material will be posted on BrightSpace. Students should check the site frequently.

Text book: There is no textbook required for this course.

Other suggested resources:

Aquaculture. Farming Aquatic Animals and Plants. 2nd edition 2012. J. Lucas and P. Southgate (Editors), 629 pp.	SH 21 A68 2003
Encyclopedia of Aquaculture. (2000). R. Stickney (Editor)	SH 20.3 E53
Principles of Aquaculture. R Stickney	SH 135 S74 1994
Introduction to aquaculture. M. Landau	SH 135 L36 1992
Ecological Aquaculture. The evolution of the blue revolution B. Costa-Pierce	SH 135 E35 2002
Cold-water aquaculture in Atlantic Canada A. Boghen	SH 37 C64 1995

Course Assessment

	Weight (% of final grade)		
Component*	**Undergrad**	**Graduate**	**Date**
Quizzes*	30	25	
Database of farmers*	10	5	
Farm report ◊	(adds to 25)	(adds to 25)	
- Recording of interview with farmer ◊	5	5	
- PowerPoint report ◊	10	10	For specific due dates, please refer to the Detailed Schedule table below (in the Course Content Section)
- Questions for students ◊	10	10	
Farm YouTube Mini-documentary ◊	15	12	
Comments on other Mini-documentaries◊	5	3	
LABS 1 to 5*†	Pass/fail†	Pass/fail†	
Final Exam*	15	10	
Participation in Discussion Boards*	2% bonus	2% bonus	
Research paper*	-	20	
TOTAL	/100	/100	

Individual work
◊ *Teamwork*
† *To pass the course, you must pass ALL Pass/Fail LABS.*

Conversion of numerical grades to Final Letter Grades

Undergraduate students follows the Dalhousie Common Grade Scale. Graduate students follows a more strict scale, where a minimum of 70% (B-) is required to pass.

	Undergraduate			Graduate		
%	**Letter Grade**	**Grade Point Value**	**Definition**	**Letter Grade**	**Grade Point Value**	**Definition**
90 - 100	A+	4.30	Exceptional	A+	4.30	Exceptional
85-89	A	4.00	Excellent	A	4.00	Excellent
80-84	A-	3.70	Very Good	A-	3.70	Very Good
77-79	B+	3.30		B+	3.30	

73-76	**B**	3.00	Good	**B**	3.00	Good
70-72	**B-**	2.70		**B-**	2.70	
65-69	**C+**	2.30	Satisfactory	F	0.00	Failure
60-64	**C**	2.00		F		
55-59	**C-**	1.70		F		
50-54	**D**	1.00	Marginal Pass	F		
<50	F	0.00	Failure	F		

Course Policies

COVID19 Policies: Masks are mandatory during in-person activities. If you feel sick or if you were in close contact with a person with COVID19, please stay home to avoid spreading the virus to other people in the class. Accommodations will be made to make sure that your grade does not suffer from your absence.

For now, we are planning for one week of online work, followed by another week of face-to-face activities. However, if there is an outbreak in the class, or if cases in Halifax climb to very high numbers, or if the instructor gets COVID19, we may have to switch to an online format. We may have to come up with creative alternatives to work our way around this pandemic.

VERY IMPORTANT: Copyrights and non-disclosure of information and media. Some farmers have shared a combination of media (photos/video), documents and other information that you can use exclusively for this course. However, **DO NOT share or post any of the farmer's information and/or media to your social networks or elsewhere.** This information and media can (intendedly or unitedly) be used to harm the farmer's reputation, which may lead to **legal action against yourself.**

Discussion boards. All questions MUST be posted in Brightspace's Discussion boards. Only use email for private/personal matters. Please follow the posting guidelines below:

Participation in Discussion Boards. You are expected to contribute to the discussion boards. **Only use email for private/personal matters**. Please follow the Discussion board posting guidelines below:
- Before you post your question, **CHECK** if the question has already been asked/answered
- Post only ONE question per post. If you have multiple questions, post them in separate posts
- The post's TITLE should be your question
- If you know the answer to a question, please help by answering the post
- Be respectful and polite

Participation grades will be computed at the end of the course. First, *engagement points* (see below) will be tallied for each student. Then, a curve will be calculated (after removing outliers) to compute the participation bonus points for each student.

Item	Score (units: engagement points)
New question	1
Already posted question	0 for the first 3 events, -1 for additional events
Correct answer	1
Partially correct answer	0.5

Incorrect answer	0 for the first 3 events, -1 for additional events
Useful comment or sharing a link to a useful resource	1
Using offensive tone or language	-1

Attendance is mandatory. You are expected to attend all lectures, labs and field trips or virtual-tours. You cannot arrive late or leave early. We will deduct any unnecessary absences from your final mark, in pro-portion to the amount of class time missed. If a problem develops that may keep you from attending a class, contact the instructor either before or on the day you need to miss a class. Note that appropriate documentation (e.g. doctor's note) is required to justify missed classes.

Video-call protocols and etiquette. Synchronous (i.e. real-time) events will require you to connect, via a link posted in Brightspace, to a "Zoom" video-call event (all time are in Halifax time, i.e., Atlantic Daylight Time, UTC-3) please be aware of time zones differences and follow the etiquette below:

- You are expected to have your **camera ALWAYS On** in a video-call, therefore:
    - Be mindful of your clothing and appearance
    - Be mindful of your background (virtual background is ok)
    - Silence your cellphone and other electronic devices
    - Advice your roommates about your video-call so they are also mindful
- **Microphone off** during video-calls except when talking

Quizzes: Online quizzes (approx. 10 minutes) will be applied to test the material from lectures and from the PowerPoints of different farms. Each quiz will be available for 24 hours. Students can answer the quiz at anytime during those 24 hours; however, there is set amount of time to answer the quiz once it is started, and there is only one attempt. Students are **required to make** and use a **hand-written "cheat-sheet"** for each Quiz. **A photo of the cheat-sheet must be uploaded to its corresponding Brightspace dropbox BEFORE you do the quiz.** Cheat-sheets not meeting specifications (see below) will result in a zero grade in the corresponding quiz. Note that appropriate documentation (e.g. SDA form, doctor's note) is required to justify missed quizzes.

Cheat-sheet specifications:
- Cheat-sheets are personal. **Copying somebody else's cheat-sheet is a serious plagiarism offence** requiring the Instructor to report all involved parties to the Academic Integrity Office.
- Cheat-sheets **MUST** be hand-written on paper. Digitization, electronic manipulation, photocopying, photo-graphing and/or printing of cheat-sheets is not allowed.
- Size: each cheat-sheet is limited to one side of a letter-sized sheet of paper.
- Content: Anything you want, but **must** demonstrate effort to synthetize lecture content.

NOTE: On your cheat-sheet, write your name, B00 number, date and Quiz number.

Database of farmers: Students will collectively create a database of aquaculture farms around the world, by searching on the internet.

- Each student needs contribute **15** farms.
- Farms can be anywhere in the world, however farmers most be able to communicate in English (even if English is not their first language)
- Before you enter a new farm, do a "find" to verify that the farm has not be entered before. IF DUPLICATES, ONLY THE FIRST ENTRY COUNTS.
- When inserting new rows in the database, keep all your entries together. When you are done, your 15 entries need to be in consecutive rows.

- The link of the database can be found in CONTENT > GENERAL, or below:
- https://docs.google.com/spreadsheets/d/1KhzXySnmmNYOfmEWYlBEu-SakvsTTqn9NYngKBxy0wFM/edit?usp=sharing

Farm report: Each team need to do a PowerPoint Report of a farm. This is a group project (~2 people per team), where each team will do a different farm.

- **Marking scales.** Three different marking scales will be used to mark the different components needed to complete the mini-documentary (see components below). These marking scales are:
  - Pass/fail marking (i.e. 100 or 0%)
  - Categorical marking (i.e. 100, 75, 50 or 0%)
  - Full range marking (i.e. any mark between 0% and 100%)

The farm report consists of the following 3 parts:

1. **Recording of interview with farmer:** [pass/fail mark] Team members are responsible for video recording the video-call with the farmer. At least one team member should "pin" the zoom screen to the farmer's feed to get footage of the farmer even when other people talk or there is a "screen-share".
   - To record the interview, you can use OBS (Open Broadcaster Software), which is free software mainly used to do live streaming, but can also do live capturing of your monitor display (i.e. screen-capturing).
   - To Download: https://obsproject.com/download
   - Here is a video tutorial on how to install OBS and use it to record your screen (note, unlike the video, you will not need to record from your webcam, but you may have to make sure that your laptop audio is recorded): https://www.youtube.com/watch?v=_LWwqbHU8L0
   - Here is the official Wiki: https://obsproject.com/wiki/OBS-Studio-Quickstart
   - Make sure you do a test way before you need to record your interview
   - The recorded interview needs to be uploaded to OneDrive (link in Brightspace).

2. **PowerPoint report:** [full-range mark] Using (1) the interview from the farmer and (2) photos and videos from the farmer's social media, each team needs to produce a PowerPoint Report of their farm.
   - The PowerPoint Report will be studied by the whole class to learn details about your farm, and the content will be tested via one quiz and in the Final Exam.
   - Make sure to include enough explanations (i.e. text) for your classmates to be able to follow the content of your PowerPoint Report WITHOUT you presenting it.
   - The sections and content of your PowerPoint Report should roughly match the "Questions to Farmers" document located in Brightspace.

3. **Questions for students:** [categorical mark] Each team is responsible to produce 15 questions about their farm. All questions must be multiple choice. The answers to these questions must be found in the PowerPoint Report. Along with the correct answer, you must also provide the incorrect answers for each multiple-choice question. These questions will be used in the quizzes and the Final Exam. **Do not share your questions (or answers) with members of other teams.**
   - All students are required to answer all quizzes and all questions in the final. However, since every team know the answers to their farm, effectively each team gets a "freebie" quiz.

YouTube Mini-Documentary: This component is done in teams. In Brightspace, there is a whole document on how to do make the mini-documentary. Teams will have the chance to submit their video, get graded and receive feedback from the instructor, TA, other teams, and the farmer. Teams will have the chance to make changes and re-submit their video a second time to improve their marks.

Comments on other students YouTube Mini-Documentary: This component is done in teams. Each team must watch all the YouTube Mini-Documentaries produced in this class. Each team must prepare a document for each mini-documentary with comments on how to improve their video. The comments must be concise and in the format shown in the table shown below:

Comments for Team 3: ACME Scallop Farm in BC		
Comm No.	Time	Comment
1	2:36	When narrator says "*Placopecten magellanicus*", ad scientific name to screen
2	3:58	Add text "Long-lines" to screen
3	4:13	Delete the rant about problems with the government. Controversial and not helpful
…	…	…

LABS: All LABS are Pass/Fail and **you must pass ALL the LABS to be able to pass the course.** The
- **Small Domestic Vessel Basic Safety.** This is a Transport Canada approved certification that is the minimum requirement to be able to crew in commercial vessels. The course takes place in *Survival Systems Training Limited* (https://www.sstl.com/) in Dartmouth. It takes the whole day. You will need to make your way to the SSTL facility on your own (e.g. via Metro-Bus). The course includes marine emergency response, marine firefighting, life-rafts and signalling devices, marine survival and rescue, and more. The course also includes swimming and getting into a life-raft in a special pool that simulates waves, wind, rain, fog and sound/visual effects (thunders, etc.).
- **Aquaculture Net Mending and Rigging.** This lab takes place in *Rainbow Net & Rigging Limited* (https://www.rainbownetrigging.com) in Dartmouth. This lab is from 3:30 pm to 7:30 pm. You will need to make your way to the SSTL facility on your own (e.g. via Metro-Bus). In this lab you will learn how use mending needles and how to patch aquaculture nets.
- **Ropes and Knots Lab.** This lab take place at Dalhousie in our designated lab. In this lab you will learn how to tie the most common knots used in aquaculture.
- **Boat Driving.** The instructor of this lab is Dalhousie's Diving Officer, John Lindley. This lab starts in the wharf located in Oakfield Road Park (see walking directions), which is about 8 minute walk from Dalhousie. Students will board a small boat and learn how to drive by practicing driving around the Northwest Arm. The boat can only take groups of 4 students, so we must divide the class accordingly and we must create a schedule so that a group of students is waiting in the wharf ready to swap with the group that is just finishing their training.
- **Aquaculture Instruments Workshop.** This lab take place at Dalhousie in our designated lab. The first part of the workshop is taught by an Aquaculture Scientists from Innovasea (https://www.innovasea.com/) as well as an online zoom presentation from Hoskin Scientific (https://www.hoskin.ca/).

Final exam: Exam is online, and format is multiple choice and/or short answers. You are allowed to use your cheat-sheets during the final exam (i.e. open book). Final will include material from the lectures, quizzes, and information from the PowerPoints reports of the farms. The Final Exam will be synchronous; time of day when the exam takes place will be determined later, depending on student availability.

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Research paper (Graduate students only)

Each graduate student needs to prepare a *Literature Review* "manuscript" following the "Review Articles" guidelines in the "Guide for Authors" from the journal Aquaculture. The manuscript must provide objective critical evaluation of the subject. It cannot consist solely of a summary of the available literature. Evaluation of the quality of existing data, the status of knowledge, and the research required to advance knowledge of the subject are essential.

Students are encouraged to discuss their interests and propose subject ideas to the instructor. However, the subject of the review will ultimately be appointed by the instructor. If the student is registered for the *Graduate Certificate in Aquaculture*, the subject of the review must also be approved by the Certificate Coordinator.

Rubric: Research paper (Graduate Students only)

Component		Comments	Weight (%)
Format		Manuscript must follow the formatting guidelines from the "Guide for Authors – Type of paper: Review Articles" from the journal Aquaculture https://www.elsevier.com/journals/aquaculture/0044-8486/guide-for-authors	5%
Clarity		Writing style must be clear and concise. The main content must be divided using headings carefully chosen to assist the reader to understand the content	10%
Critical thinking		The manuscript cannot be a simple summary of literature. Students must demonstrate the ability to evaluate the quality of the available knowledge and to provide suggestions for further advance the subject	10%
Content	Title	Follow instructions in "Guide for Authors – Type of paper: Review Articles" from the journal Aquaculture. https://www.elsevier.com/journals/aquaculture/0044-8486/guide-for-authors	5%
	Abstract		10%
	Table of contents		5%
	Introduction		5%
	Content sections		30%
	Conclusions		10%
	References		10%
		TOTAL:	100%

Course Content

Detailed Schedule
All dates and times are in (Halifax) <u>Atlantic Daylight Time</u> (UTC-3). Note that quizzes, exams and other due dates are shown in red and synchronous real-time events are shown in blue.

Day	Date	Topic

1	Thu Apr 28	(**11 am**) Zoom meeting: Welcome and introduction to the course. See link in Brightspace
		Lecture – Introduction to Aquaculture
		Lecture – Culture systems
		Students should:
		  - Sign the Non-Disclosure Agreement
		  - Organize into teams
		  - Download and test screen capturing software
		  - Work on Database of farmers
		  - Research farm background information by reading farmer's websites, social media and uploaded content
		  - Start working "PowerPoint Report"

2	Fri Apr 29	Virtual-tours of farms 1. See Brightspace for times and links to meetings Record interview with farmer (only teams with presenting farmers) Zoom meeting to discuss virtual-tours of farms 1. See Brightspace for times and links to meetings Record discussion (only teams with presenting farmers) Quiz + cheat-sheet (Introduction to Aquaculture) - deadline: 11:30 pm ADT Quiz + cheat-sheet (Culture Systems) - deadline: 11:30 pm ADT Submit Database of farmers: 11:30 pm ADT
3	Sat Apr 30	"Wild-card day"
4	Sun May 1	Day off
5	Mon May 2	Virtual-tours of farms 2. See Brightspace for times and links to meetings Record interview with farmer (only teams with presenting farmers) Zoom meeting to discuss virtual-tours of farms 2. See Brightspace for times and links to meetings Record discussion (only teams with presenting farmers) Submit PowerPoint reports: Farms 1 (only teams with presenting farmers)
6	Tue May 3	Virtual-tours of farms 3. See Brightspace for times and links to meetings Record interview with farmer (only teams with presenting farmers) Zoom meeting to discuss virtual-tours of farms 2. See Brightspace for times and links to meetings Record discussion (only teams with presenting farmers) Submit PowerPoint reports: Farms 2 (only teams with presenting farmers) Quiz (Farms 1) - deadline: 11:30 pm ADT

7	Wed May 4	Virtual-tours of farms 4. See Brightspace for times and links to meetings
		Record interview with farmer (only teams with presenting farmers)
		Zoom meeting to discuss virtual-tours of farms 2. See Brightspace for times and links to meetings
		Record discussion (only teams with presenting farmers)
		Submit PowerPoint reports: Farms 3 (only teams with presenting farmers)
		Quiz (Farms 2) - deadline: 11:30 pm ADT
8	Thu May 5	Virtual-tours of farms 5. See Brightspace for times and links to meetings
		Record interview with farmer (only teams with presenting farmers)
		Zoom meeting to discuss virtual-tours of farms 2. See Brightspace for times and links to meetings
		Record discussion (only teams with presenting farmers)
		Submit PowerPoint reports: Farms 4 (only teams with presenting farmers)
		Quiz (Farms 3) - deadline: 11:30 pm ADT
9	Fri May 6	LAB1: Small Domestic Vessel Basic Safety (early morning – SSTL Facilities, in Dartmouth)
10	Sat May 7	Submit PowerPoint reports: Farms 5 (only teams with presenting farmers)
		Quiz (Farms 4) - deadline: 11:30 pm ADT
11	Sun May 8	Day off
12	Mon May 9	LAB2: Ropes and knots (10 am at the lab)
		Quiz (Farms 5) - deadline: 11:30 pm ADT
13	Tue May 10	LAB3: Boat Driving (Diving Officer: John Lindley) wharf located in Oakfield Road Park
		Meeting times vary for each team
14	Wed May 11	LAB4: Net mending (3:30 pm - Rainbow Rigging, Dartmouth)
15	Thu May 12	LAB5: Aquaculture Instruments (Innovasea, Hoskin Scientific) - 10 am at the lab
16	Fri May 11	Final exam – time to be determined
-	Fri May 20	Submit "Research paper" (only Graduate Students) - deadline: 11:30 pm ADT

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University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.
Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).
Information: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.
Code: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness
Statement: http://www.dal.ca/cultureofrespect.html

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) (elders@dal.ca).
Information: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates in the Academic Year (including add/drop dates)
https://www.dal.ca/academics/important_dates.html

University Grading Practices
https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

Missed or Late Academic Requirements due to Student Absence (policy)
https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html

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Student Resources and Support

Advising

General Advising https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors: https://www.dal.ca/faculty/science/current-students/academic-advising.html

Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html

Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports

Library: https://libraries.dal.ca/

Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Copyright Office: https://libraries.dal.ca/services/copyright-office.html

Fair Dealing Guidelines https://libraries.dal.ca/services/copyright-office/fair-dealing.html

Other supports and services

Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html

Student Advocacy: https://dsu.ca/dsas

Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Safety

Biosafety: https://www.dal.ca/dept/safety/programs-services/biosafety.html

Chemical Safety: https://www.dal.ca/dept/safety/programs-services/chemical-safety.html

Radiation Safety: https://www.dal.ca/dept/safety/programs-services/radiation-safety.html

Scent-Free Program: https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html