



**DALHOUSIE  
UNIVERSITY**

**Faculty of Science Course Syllabus  
Department of Mathematics & Statistics**

**MATH 4045/5045 Advanced Algebra  
Winter 2019**

**Instructor:** Professor Sara Faridi ([faridi@mathstat.dal.ca](mailto:faridi@mathstat.dal.ca))  
**Office:** Chase 314  
**Lectures:** Mondays, Wednesdays & Fridays 11:25 pm -- 12:25 pm Chase 227  
**Office Hours:** Tuesdays 2:30 – 3:30 pm & Wednesdays 9 -- 10 am in Chase 314  
**Website:** <http://mathstat.dal.ca/~faridi/teaching/5045.html>

**Course Description:** Introduction to module theory: modules, submodules, quotient modules, module homomorphisms, generators for modules, direct sums, free modules, tensor products, exact sequences, projective modules, injective modules, and flat modules. Modules over principal ideal domains. Additional topics may include homological algebra, Ext and Tor Functors, symmetric and exterior algebras.

**Course Prerequisites:** MATH 3032

**Required Course Material:** I will be mostly using “Algebra” by Thomas Hungerford. If you do not have a copy already, please talk to me and we can make arrangements.

**Course Content:** For the majority of the semester we will be working our way through Chapter 4 of Hungerford's “Algebra”, which covers basics of module theory. Depending on how fast we go, we will try to cover the derived functors Ext and Tor and some homological algebra.

<b>Course Assessment: Component</b>	<b>Weight (% of final grade)</b>	<b>Date</b>
<i>Midterm exam</i>	25%	<b><u>February 13 or 15, in class</u></b>
<i>Final exam</i>	50%	TBD
<i>Assignments</i>	25%	Weekly or biweekly

**Course Policies:** Homework will be assigned at the end of each topic. All or some problems on each assignment will be graded. Homework is due at the beginning of class. Late homework counts as zero, but at the end of the term the two lowest homework grades for each student will be dropped. You may work in groups on problems, but the written work that is handed to me should be written by each student individually. In particular, I do not accept work that is too similar to another person's.

Practice problems may be assigned during some classes. Students are expected to think about these problems and participate in discussions about them. A missed exam counts as zero unless a doctor's note is presented or prior arrangements have been made with me. Calculators, textbooks, and notes are not allowed in exams.

**Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale**

<i>A+</i> (90-100)	<i>B+</i> (77-79)	<i>C+</i> (65-69)	<i>D</i>	(50-54)
<i>A</i> (85-89)	<i>B</i> (73-76)	<i>C</i> (60-64)	<i>F</i>	(<50)
<i>A-</i> (80-84)	<i>B-</i> (70-72)	<i>C-</i> (55-59)		

## 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](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](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](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](mailto:elders@dal.ca)).

**Information:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](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](https://www.dal.ca/academics/important_dates.html)

### University Grading Practices

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](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](https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html)

## **Student Resources and Support**

### **Advising**

**General Advising** [https://www.dal.ca/campus\\_life/academic-support/advising.html](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](https://www.dal.ca/campus_life/communities/indigenous.html)

**Black Students Advising Centre:** [https://www.dal.ca/campus\\_life/communities/black-student-advising.html](https://www.dal.ca/campus_life/communities/black-student-advising.html)

**International Centre:** [https://www.dal.ca/campus\\_life/international-centre/current-students.html](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](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](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](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](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>