Course Description

The fundamental theory and principles of surface science are introduced. Topics include the atomic structure of solid surfaces, thermodynamic and kinetic properties of surfaces, electronic and bonding behavior of surfaces, catalytic processes by surfaces, and typical surface analysis techniques.

Course Prerequisites

CHEM 2301 & 2304, or PHYC 3200 & 3640, or equivalent. Minimum grades: C-

Course Objectives/Learning Outcomes

This class will cover some fundamentally important topics on surface chemistry and physics. It will provide students with the opportunity to integrate knowledge learned in previous physical chemistry (or chemical physics) classes and apply it to various technically important systems where the surfaces are essential in controlling their overall properties and performance.

Course Materials

- Introduction to surface chemistry and catalysis, 2nd edition, G.A. Somorjai and Y. Li, Wiley, 2010 (recommended but not required)
- Course website

Course Assessment

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight (% of final grade)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes (in class)</td>
<td>25</td>
<td>Weekly in class</td>
</tr>
<tr>
<td>Test 1 (in class)</td>
<td>25</td>
<td>Date to be announced in class</td>
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<tr>
<td>Test 2 (in class)</td>
<td>25</td>
<td>Date to be announced in class</td>
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<tr>
<td>Final exam</td>
<td>25</td>
<td>Date to be announced in class</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
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</tbody>
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Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

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

Course Policies

Students should use the Student Declaration of Absence form for missed academic requirement in this course (except for the final exam). Additional information is in the supplemental syllabus. If a student is ill or experiencing an extreme personal emergency at the time of a test or an assignment, contact the instructor in advance to explain the situation. There will be no make-up quizzes or tests. In the case of an excused quiz/test, the % of the missing quiz/test will be added to the final exam correspondingly.

Course Content

- 1. Introduction
- 2. The structure of surfaces
- 3. Thermodynamics of surfaces
- 4. Dynamics at surfaces
- 5. Electronic properties of surfaces
- 6. Surface chemical bonding
- 7. Catalysis by surfaces
- 8. Polymer and biological surfaces
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.

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
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

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

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