

Environmental **DESIGN**

architecture + landscape architecture + planning

Sustainability in the Built Environment EVDS 523 | ARST 423 H (3-0)

Instructor: Dr. C. Hachem-Vermette

Fall 2019

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Introduction

Sustainable development has historically been defined (Brundtland, 1987) as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Since the publishing of “Our Common Future” several decades back, governments, corporations, organizations and citizens have been struggling to understand the implications of industrialization, population growth, resource depletion, information technology and other factors on our health, happiness and quality of life. Given the issues at play and the global scale of activity, the idea of sustainability has been allusive and complex, yet increasingly demanding and urgent.

The principle of sustainability recognizes people as temporary stewards of their environments, working toward a respect for natural systems and a higher quality of life. It is imperative to engage in informed examination of the built environment and to consider tools to achieve a more stable, balanced and regenerative ecosystem. This course, which encourages students to think creatively, critically and holistically, examines a spectrum of problems, principles, practices and opportunities pertaining to sustainability.

Course Learning Outcomes

By the end of this course students will be able:

1. To demonstrate understanding of theories, principles and practices focused on sustainability in the built environment
2. To provide straightforward and practical examples of how sustainability can be achieved
3. To analyze site and neighborhood designs according to principles for planning sustainable and efficient neighborhoods
4. To analyze sustainability measures in buildings including energy and resource efficiency .
5. To formulate personal and professional positions concerning sustainability

Teaching Approach

Sustainability as a concept and practice proves complex, challenging and vital. This course is structured to present a wide array of viewpoints on key ideas concerning sustainability in the built environment. The course will be presented through lectures, workshops, international and Canadian case studies, guest lectures, and individual & group assignments /presentations aimed at gaining a wide & rich understanding of this at times complicated concept. Guest lectures will be delivered by academics and professionals versed and active in realms of sustainability. Students are expected to critically consider the range of approaches being discussed in our classes and to begin to formulate, delineate & articulate their own positions.

Content: Selected Topic Areas

- Overview of Sustainability {especially considering Architecture & Environmental Design}
- Climate change| Human effects| GHG emissions
- Sustainable development| Sustainable site planning and Analysis
- Energy | Resources
- Sustainable neighborhood design| Natural flow |Ecology | Landscapes
- Sustainable building initiatives (Green Buildings, PassiveHaus, NZEB)
- Refurbishment for sustainability
- Building materials & building construction and their environmental impact
- Sustainable building services| Smart technologies
- Measuring sustainability| Environmental Quality | Integration

Detailed Class Schedule (tentative)

Week 1	Sept 5	L1- Introduction to sustainability: overview of sustainability, global climate change, human activities and their effects, GHG emissions, universal efforts to increase sustainability- introducing term project
Week 2	Sept 12	L2- Three pillars of sustainability; Concepts of sustainable development and sustainable urbanism; Sustainable site planning (1)-introduction. Project discussion.
Week 3	Sept 19	L3- Site planning (2), Principles of site analysis, Improving sustainability of a site (e.g. stormwater, reducing site disturbance, vegetation)
Week 4	Sept 26	L4- Sustainable Site (ctd) (3) - Examples of sustainable sites and case studies.
Week 5-	Oct 3	Project tutorial
Week 6	Oct 10	Project part 1 submission L5-Introduction to alternative Energy (Solar, wind, Hydro, biofuel, etc.); Introduction to sustainable buildings standards: green buildings vs sustainable buildings.
Week 7	Oct 17	L6- Energy efficiency and sustainability; Passive House; Net Zero Energy Buildings (NZEB), Examples of different types of NZEB;
Week 8	Oct 24	Block week -
Week 9	Oct 31	L7- Building envelope effect and energy efficiency measures, renewable energy integration, sustainable building services, construction and materials, integrated design.
Week 10	Nov 7	L8- Energy use and GHG emissions- Life Cycle Assessment (LCA); Measuring sustainability;
Week 11	Nov 14	Midterm break
Week 12	Nov 21	Term Project and presentation submission(on D2L) Term Project- Students' presentations-
Week 13	Nov 28	Term Project- Students' presentations-ctd
Week14	Dec 5	Research feedback
	Dec 9	Submission of papers

Assessment

The course evaluation will be based on the following assignments completed during the term, which includes a group project containing an individual component, and a paper. **There will be no final examination.**

Site Planning + Design Project& presentation (Group + individual component)	50%
Sustainability Framework Paper (Individual)	40%
Student participation	10%
Total	100%

The project:

The term project is a group project with individual component (10% of the grade). The project consists of an exercise of application of sustainable design (details will be provided), to sites and buildings. The project aligns with the course outcomes 1-5, and will be formed of 3 parts:

1. Analyzing of an existing community from sustainability point of view (submission: report) (30%)
2. A final project presenting all the analysis, with submitted report and full presentation by groups.(50%)
3. An individual part discussing the part done by each individual of the group, and the perspective of this individual on the design attained, and lessons learned (details will be provided in the project).(10%)

The instructor evaluation of the project, including creativity, quality of analysis, quality of report forms 10% of the total grade.

Paper:

The paper is an individual assignment. It covers all outcomes identified above. Students are required to discuss and analyze a specific sustainability issue. Details will be provided early in the term.

Student participation:

Participation in this class, including class discussions, written feedback on presentations of other students (peer review for projects), group work in class, will form 10% of the total student grade. This participation proved to be very important in this class, as it contributes significantly to enrich the experience of all students.

Additional notes on assignments:

- Assignments should be submitted using D2L, and are due by **3pm** on the day listed on this schedule unless otherwise directed by the instructor.
- All assignments, term papers and academic exercises are to be submitted in an electronic format, on D2L
- Writing and the grading of writing is a factor in the evaluation of student work, A 'Writing Across the Curriculum' policy statement is located in the course calendar:
<http://www.ucalgary.ca/pubs/calendar/current/e-2.html> "Writing skills are important to academic study across all disciplines. Consequently, instructors may use their assessment of writing quality as a factor in the evaluation of student work."

Grading Scale

Grade	Grade Point Value	4-Point Range	Percent	Description
A+	4.00	4.00	95-100	Outstanding - evaluated by instructor
A	4.00	3.85-4.00	90-94.99	Excellent - superior performance showing comprehensive understanding of the subject matter
A-	3.70	3.50-3.84	85-89.99	Very good performance
B+	3.30	3.15-3.49	80-84.99	Good performance
B	3.00	2.85-3.14	75-79.99	Satisfactory performance
B-	2.70	2.50-2.84	70-74.99	Minimum pass for students in the Faculty of Graduate Studies

C+	2.30	2.15-2.49	65-69.99	All final grades below B- are indicative of failure at the graduate level and cannot be counted toward Faculty of Graduate Studies course requirements.
C	2.00	1.85-2.14	60-64.99	
C-	1.70	1.50-1.84	55-59.99	
D+	1.30	1.15-1.49	50-54.99	
D	1.00	0.50-1.14	45-49.99	
F	0.00	0-0.49	0-44.99	

Notes:

- A student who receives a "C+" or lower in any one course will be required to withdraw regardless of their grade point average (GPA) unless the program recommends otherwise. If the program permits the student to retake a failed course, the second grade will replace the initial grade in the calculation of the GPA, and both grades will appear on the transcript.

Readings

Recommended readings include:

- Kazimee Bashir, Sustainable Urban Forms : Theory, Design and Application, First edition, Cognella Academic Publishing, 2018.
- Barton, H., Grant, M., Guise, R. , Shaping Neighbourhoods: For Local Health and Global Sustainability, Routledge; 2 edition, 2010.
- Alison Cotgrave; Mike Riley Total Sustainability in the Built Environment, Palgrave Macmillan, 2012.
- Lynch, Kevin; Hack, Gary (1962). Site Planning. MIT Press. (2nd ed. 1971; 3rd ed. 1984)

In addition, list of readings related to selected topics will be posted regularly on D2L.

Important Notes

1. Written work, term assignments and other course related work may only be submitted by e-mail if prior permission to do so has been obtained from the course instructor. Submissions must come from an official University of Calgary (ucalgary) email account.
2. Academic Accommodations. Students who require an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to their Instructor or the designated contact person in EVDS, Jennifer Taillefer (jtaillef@ucalgary.ca). Students who require an accommodation unrelated to their coursework or the requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Vice-Provost (Student Experience). For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/
3. Plagiarism - Plagiarism involves submitting or presenting work in a course as if it were the student's own work done expressly for that particular course when, in fact, it is not. Most commonly plagiarism exists when:(a) the work submitted or presented was done, in whole or in part, by an individual other than the one submitting or presenting the work (this includes having another impersonate the student or otherwise substituting the work of another for one's own in an examination or test),(b) parts of the work are taken from another source without reference to the original author,(c) the whole work (e.g., an essay) is copied from another source, and/or,(d) a student submits or presents work in one course which has also been submitted in another course(although it may be completely original with that student) without the knowledge of or prior agreement of the instructor involved. While it is recognized that scholarly work often involves reference to the ideas, data and conclusions of other scholars, intellectual honesty requires that such references be explicitly and clearly noted. Plagiarism is an extremely serious academic offence. It is recognized that clause (d) does not prevent a graduate student incorporating work previously done by him or her in a thesis. Any suspicion of plagiarism will be reported to the Dean, and dealt with as per the regulations in the University of Calgary Graduate Calendar.
4. Appeals: If a student has a concern about the course, academic matter, or a grade that they have been assigned, they must first communicate this concern with the instructor. If the concern cannot be resolved

with the instructor, the student can proceed with an academic appeal, which normally begins with the Faculty: <http://www.ucalgary.ca/provost/students/ombuds/appeals>

5. Information regarding the Freedom of Information and Protection of Privacy Act (<https://www.ucalgary.ca/legalservices/foip>)
6. Emergency Evacuation/Assembly Points (<http://www.ucalgary.ca/emergencyplan/assemblypoints>)
7. Safewalk information (<http://www.ucalgary.ca/security/safewalk>)
8. Contact Info for: Student Union (<https://www.su.ucalgary.ca/contact/>); Graduate Student representative (<https://gsa.ucalgary.ca/about-the-gsa/gsa-executive-board/>) Student Union Wellness Centre: <https://www.ucalgary.ca/wellnesscentre/>; Library Resources: <http://library.ucalgary.ca/> and Student Ombudsman's Office (<http://www.ucalgary.ca/ombuds>)

CACB Student Performance Criteria:

The following CACB Student Performance Criteria will be covered in this course at a primary level (other criteria will be covered at a secondary level): A1. Critical Thinking Skills; A6. Human Behaviour, B3. Site Design, and B4. Sustainable Design. (*see CACB SPC matrix for further details*)

Contact & Office Information

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Please contact instructor and teaching assistants with any questions or concerns. Meetings by appointment.