2019 Course Outline ~ **ENV 335H ENVIRONMENTAL DESIGN** ~ School of Environment, U of T

**Course Instructor:** Sheila Waite-Chuah, BA, AOCA, MES  Email: sheila.waite.chuah@utoronto.ca
**Hours of Instruction:** Wednesdays 12-2, Earth Sciences, Room Basement ES B149.
**Office:** ES Room 2104, 2-3 pm ~ by appointment ~ Instructor is not on campus at any other time.
* Students can also meet with instructor before & after class. Course material on Quercus.

**I. Introduction**

Sustainable design is defined as ‘a philosophical approach to design that seeks to maximize the quality of the built environment while minimizing or eliminating negative impacts to the environment.’ (McLennan, 2004) This course addresses the fact that buildings are often overlooked as significant contributors to greenhouse gasses and global warming, with subsequent impacts to BOTH environmental and human health. The need for sustainable solutions is increasingly urgent, given the on-going mass-migrations of human populations to urban centres.

Much research examines the quantitative aspects of our carbon footprint, but this course will also look at qualitative measures of sustainable living. Through leading-edge case studies, this course will review theory and practices across multiple scales of sustainable design, including architecture, engineering, product design, landscape architecture and urban design.

‘Low-tech’ and ‘high-tech’ strategies for green buildings will be examined, with many references to re-integrating traditional practices – natural ventilation and thermal mass, for example. Excellence in architectural design will be explored through case studies from around the world; a class tour to the Brickworks (tbc) will present a showcase of ecological strategies integrating natural and built systems.

**Course Learning Objectives**

- to introduce students to a range of principles and practices in sustainable design
- to understand the built environment as a major contributor to environmental degradation
- to promote an understanding of sustainable design as at the interface of many systems: cultural, economic, political, natural
- to highlight the interdisciplinary nature of sustainable design through exploring engineering, architecture, product design, landscape architecture, and urban design
- to cultivate sustainable design literacy
- to provide students with an opportunity to link research with practice
- to provide students with an opportunity for a solutions-based approach to environmental issues

**Class Format**

Class time will be spent reviewing PowerPoint lectures and engaging in class discussion.

- regular attendance and on-time arrival (12:10 – to allow travel between classes)
- cell-phones off in class; laptops for note-taking permissible, for material not on PowerPoint
- active and meaningful participation in class discussion and presentations
- on-time submission of assignments – HARD COPY and DIGITAL submission
- Two mandatory workshops – for design projects.

**II. Required Reading**

Course material is presented in PowerPoint lectures available on Quercus course files; material is sourced from a broad range of current texts on sustainable design (Bibliography below).

There are no extra readings – texts are as reference only.
III. **Assignments**

See Quercus, ‘Course Materials’. All assignments will be reviewed in detail in mandatory Workshops (see schedule).

- 3 Quizzes ~ multiple-choice, short-answer (@15% = 45%)
- ‘Dream Home’ assignment (25%)
- Sustainable Design Awards (30%)

*Students are encouraged to work in teams of two for Awards assignment.*

**Missed Quiz ~**

As per Article 7, Academic Handbook, it is the responsibility of the student to talk with the instructor regarding an opportunity for a make-up quiz, and must complete a ‘Request for Make-Up Quiz Form’ provided by instructor, plus other relevant documentation*. This must be done as soon as possible, and no later than during week of the missed quiz. **No opportunities after this time period.**

*Medical Certificate & Documentation Supporting Extensions; Accessibility Needs (see p 4/5 below).

**Late Assignments / Extensions ~**

Students must request permission for an extension, and complete a ‘Request for Extension Form’ provided by the instructor, plus other relevant documentation*. Without permission, marks will be deducted at 2% per day, including weekends, for a maximum of 5 days.

*Medical Certificate & Documentation Supporting Extensions; Accessibility Needs (see p 4/5 below).

**Submitting Assignments ~ Digital on Quercus and Hard Copy in Class**

**Quercus:** Assignments are submitted to Quercus so that evaluations can be forwarded to ROSI; this allows for timely notification of marks at end-of-term.

**Hard Copy:** Double-sided, stapled copies are submitted to instructor in class, for marking purposes.

**Submitting Late Assignments ~ Digital on Quercus and Hard Copy to DROP-BOX.**

**Quercus:** Submit late work to Quercus, for date check and per above.

**Hard Copy:** Submit to Drop-Box located at David Powell’s office, Rm.1022, 33 Willcocks.

Marks will be deducted if Hard Copy is not submitted - in class, or to Drop-Box, as appropriate.

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**ENV 335H ~ Environmental Design ~ 2019 Weekly Schedule ~ U of T**

Sheila Waite-Chuah, BA, AOCA, MES [sheila.waite.chuah@utoronto.ca](mailto:sheila.waite.chuah@utoronto.ca) Office: ES 2104, 2-3 pm, by appointment

**Week 1 January 9**

**Introduction:** course content, weekly schedule, assignments.  
**Note:** Class material is presented in PowerPoint format and is accessed on Quercus ‘Files’. There are no extra readings – *texts are as reference only.*

The Evolution of Sustainable Design ~ Part I
<table>
<thead>
<tr>
<th>Week 2</th>
<th>The Evolution of Sustainable Design ~ Part II</th>
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<tbody>
<tr>
<td></td>
<td>Industrial &amp; Modernist Beginnings</td>
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<table>
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<tr>
<th>Week 3</th>
<th>Low-Tech Solutions ~ Part I</th>
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<tbody>
<tr>
<td>January 23</td>
<td>Principles of thermal comfort; historical and contemporary strategies for Passive Cooling: natural ventilation, thermal mass, façade integration.</td>
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<tr>
<td></td>
<td>Ref: <em>Macaulay &amp; McLennan, 2006; Lechner 2009</em></td>
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<table>
<thead>
<tr>
<th>Week 4</th>
<th>Low-Tech Solutions ~ Part II</th>
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<tbody>
<tr>
<td>January 30</td>
<td>Passive Cooling: shading; Passive Solar Heating; Daylighting.</td>
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<td></td>
<td>Ref: <em>Macaulay &amp; McLennan, 2006; Lechner, 2009, AASHRAE</em></td>
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**Quiz # 1 ~ 15% ~ Evolution Part I & II; Low-Tech Part I (Wks 1, 2, 3)**

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<thead>
<tr>
<th>Week 5</th>
<th>‘10 Shades of Green’ ~ Sustainable Architecture</th>
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<tr>
<td>February 6</td>
<td>Principles &amp; Case Studies, including local examples.</td>
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<tr>
<td></td>
<td>Ref: <a href="http://www.tenshadesofgreen.org/middle_main.html">http://www.tenshadesofgreen.org/middle_main.html</a></td>
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**Workshop ~ Dream Home (Due: Week 9, March 13th)***

**Review:** Content, format for paper (text & images), evaluation criteria, submitting.

**NOTE:** Student samples will be shown as reference & inspiration.

<table>
<thead>
<tr>
<th>Week 6</th>
<th>High-Tech Solutions</th>
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<tbody>
<tr>
<td>February 13</td>
<td>High-technology solutions, focusing on heating &amp; cooling.</td>
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<tr>
<td></td>
<td>Ref: <em>Macaulay &amp; McLennan, 2006</em></td>
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**Quiz # 2 ~ 15% ~ Low-Tech Part II; 10 Shades of Green (Wks 4 & 5)**

February 18th – 22nd ~ **Reading Week - No Classes**

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<tr>
<th>Week 7</th>
<th>‘Waste Equals Food’ ~ Sustainable Product Design</th>
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<tr>
<td>February 27</td>
<td>Cradle-to-Cradle: Remaking the Way We Make Things.</td>
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<td></td>
<td>Ref: <em>McDonough &amp; Braungart, 2002</em></td>
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<tr>
<th>Week 8</th>
<th>Ecological / Landscape Design</th>
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Biological & Indigenous/Vernacular Beginnings
March 6  Principles for the integration of built and living systems.  
Ref: Sim Van der Ryn and Stuart Cowan, 1996.

**Quiz # 3 ~ 15% ~ High-Tech; Waste=Food (Wks 6 & 7)**

  Zannah Matson, TA, presentation on landscape design.

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**Week 9**

**March 13**

**Assignment Due: Dream Home ~ 25%**

Submission details ~ see Assignment Document.

**Workshop** ~ Sustainable Design Awards (Due Week 12, April 3rd)

Review: Content, digital poster format (text & images), evaluation criteria, submitting; graphic design tips for digital poster.

**Note:** Student samples will be shown as reference & inspiration.

**Note:** Students are encouraged to work in teams of two for this assignment.

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**Week 10**

**March 20**

**Bioregional Design ~ Sustainable / Affordable Housing**

‘One Planet Living’,  Ref: http://www.opl.org/index.html;

Case Study: Bed ZED Housing UK. Post-Occupancy Assessment from Tenants.

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**Week 11**

**March 27**

**TOUR: Annual Tour ~ Evergreen Brickworks ~ Local Case Study**

‘People / Planet / Prosperity’

FREE Transportation - by shuttle bus, close to Broadview subway station

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**Week 12**

**April 3**

**Assignment Due: ‘Sustainable Design Awards’ ~ 30%**

Submission details ~ see Assignment Document.

Student Presentations in class ~ by lottery

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**Bibliography**

ASHRAE – American Society for Heating, Refrigeration & Air-Conditioning Engineers


Benyus J.  **A Good Place to Settle: Biomimicry, Biophilia and the Return of Nature’s Inspiration to Architecture.**  Chapter 3.  [From Kellert, 2008]

Jodidio, Philip, **GREEN Architecture Now!**  Taschen, 2009.
  - Case studies, from a global context


- Main reference, ‘biophilic design’


- General reference, ‘Low-Tech’, passive strategies


- ‘Low-Tech’ & ‘High-Tech’ strategies in ecological engineering


- Lecture on product design, i.e., consumer products


- Principles of ecological engineering


- ‘Six Fallacies of Vernacular Architecture’, ‘Six Explanations’

Parsons, K.C. Human Thermal Environments. NY, Taylor & Francis, 2002

- The effects of hot, moderate and cold environments on human health and comfort and performance.


- ‘Cautionary Tales’ of Sumerian, Easter Island cultures


- Principles addressing the integration of built and living systems


Technical Material
The following information is included on behalf of the School for Environment. Read carefully.

A. Plagiarism
Please note that according to the University’s Code of Behaviour on Academic Matters, it is an offence for a student to:

1. “represent as one’s own any idea or expression of an idea or work of another in any academic examination or term test or in connection with any other form of academic work, i.e., to commit plagiarism.”
2. “submit, without the knowledge and approval of the instructor to whom it is submitted, any academic work for which credit has previously been obtained or is being sought in another course or program of study in the University or elsewhere.
3. “submit for credit any academic work containing a purported statement of fact or reference to a source which has been concocted.”


See also the handout “How Not to Plagiarize,” Margaret Proctor, 2009, available online at http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize

Cases of suspected plagiarism will be addressed in accordance with the procedure established by the Code of Behaviour on Academic Matters.

B. Accessibility Services

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Accessibility Needs:
The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible: disability.services@utoronto.ca or http://studentlife.utoronto.ca/accessibility.

Medical Certificate & Documentation Supporting Extensions, etc.

Students must use the University’s official Student Medical Certificate as the standard documentation requirement for medical-based extension requests. A copy can be found on the web at http://www.healthservice.utoronto.ca/ for inclusion in your course website or reader.

Students must use a medical certificate and/or provide other documented proof, where feasible, if they request an extension for assignments, term test during class time, etc. This documentation must be kept secure and confidential under provincial privacy legislation.
A student who is registered with Accessibility Services, or otherwise provides appropriate documentation to their college registrar, may receive a Registrar’s Letter attesting to his/her legitimate need for an extension or other consideration, which you should accept in lieu of the student providing you with the supporting documentation directly. This protects the student’s personal information, makes it easier for him/her to request and get appropriate consideration, and relieves you of having to secure private information about the student that is contained in supporting documentation.

Faculty of Arts & Science Policies
Information about important policies about marking, petitions, etc., can be found on the Faculty of Arts and Science website at: http://www.artsandscience.utoronto.ca/ofr/calendar/rules.htm#behaviour

Evaluation Criteria ~ A standard evaluation criteria policy, which is included for your interest. The primary criteria used in evaluating written work are the following.

1) Mechanics: Defined as freedom from spelling and grammatical errors. Students are expected to include thorough, accurate and consistent references in any bona fide academic referencing style that includes page numbering.

2) Writing style: Defined as clarity, succinctness, appropriate diction and tone.

3) Structure: Defined as coherence of the organization of the paper. The logic of the structure is determined by the purpose, which is to test an hypothesis, answer a research question or defend a thesis statement.

4) Precision and accuracy. Precision means saying exactly and specifically what you mean, avoiding vague generalities. Accuracy refers to absence of major factual errors.

5) Analysis: Student essays are expected to include critical distance, reflection and originality of thought. The proposal and term paper will be evaluated on the defensibility of their analysis in terms of their use of evidence and logical coherence.

EVALUATING ~ Evaluating Student Work
Students will be evaluated on the course requirements according to the information in the assignment document. Students will be provided with evaluation criteria for each assignment. Overall grades will be assessed in accordance with the University’s description as provided in the Academic Handbook as discussed below.

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Grade Definition</th>
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<tbody>
<tr>
<td>A+</td>
<td>Outstanding performance, exceeding even the A described below.</td>
</tr>
<tr>
<td>A</td>
<td>Exceptional performance: strong evidence of original thinking; good organization, capacity to analyze and synthesize; superior grasp of subject matter with sound critical evaluations; evidence of extensive knowledge base.</td>
</tr>
<tr>
<td>B</td>
<td>Good performance: evidence of grasp of subject matter; some evidence of critical capacity and analytic ability; reasonable understanding of relevant issues; evidence of familiarity with the literature.</td>
</tr>
<tr>
<td>C</td>
<td>Intellectually adequate performance: student who is profiting from her or his university experience; understanding of the subject</td>
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matter and ability to develop solutions to simple problems in the material.

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<th>Grade</th>
<th>Description</th>
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<tr>
<td><strong>D</strong></td>
<td><strong>Minimally acceptable performance</strong>: some evidence of familiarity with subject matter and some evidence that critical and analytic skills have been developed.</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td><strong>Inadequate performance</strong>: little evidence of even superficial understanding of the subject matter; weakness in critical and analytic skills; with limited or irrelevant use of literature.</td>
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