IDES 3107 Design and Sustainability    Winter 2018    COURSE OUTLINE

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                   brady@sustainableenterpriseconsulting.com

Course time and location     Wednesdays  8:35am – 11:25am   Location Southam Hall 515

Office hours       After scheduled class or by appointment

Office           3269  MacKenzie Building (ME)

Course Description
Sustainability and the industrial designer’s role in creating more environmentally and socially responsible products. Imperatives and drivers for integrating sustainability into product design. Sustainable design strategies and tools, business case for sustainable design, and case studies.

Learning Outcomes
By the end of this course students will be able to;

1. Articulate the importance of sustainability for product design, the role of sustainability in product development and the principles of sustainable design.

2. Understand how to apply life cycle strategies and circular economy concepts to understand the potential impacts of a current product or concept.

3. Discern a viable eco-design strategy for a product and justify how it contributes to sustainability.

4. Understand social impacts of product systems and emerging techniques to measure them.

5. Apply concepts and techniques of eco design to real life projects

Course Schedule
Course schedule is provided in Appendix 1.

Guests Lectures. 2-3 guest lectures are planned.

Recommended Reading and Resources

Is there a sustainable product?  Kevin Brady 2016. Available on course site or
https://sustainabilityworkshop.autodesk.com/product-design


Mining and metals and the circular economy. Available on course site. International Council on Mining and Metals 2016 (Kevin Brady author)


Green building design and products for sustainable construction. http://www.greenspec.co.uk/


Centre for Sustainable Design at University for the Creative Arts (UCA), Farham, UK.  http://cfsd.org.uk/  - Excellent set of resources on sustainable design practices, research, case studies and project outcomes.


Required Text

There is no required reading. Articles/readings will be recommended throughout the course.

Course Projects/Assignments/Exams

Assignment 1 (40% of course mark)
Research and write an analysis of a product that is marketed as being environmentally or socially responsible/preferred. Address the following:

1. Describe the product, its primary function and main life cycle stages (20 marks)
2. Document the “sustainability” benefits of the product being promoted by the manufacturer (10)
3. Research and document the main environmental and social impacts associated with the product life cycle (30)
4. Compare 2 and 3 – do the benefits claimed adequately reflect the main issues identified in your research (30)
5. Bonus points - speculate on the role of design in addressing any gaps or making additional improvements in the sustainability performance of the product (10)

Assignment 2 (35% of course mark)
Students will be assigned in groups to an “advanced concepts” cross functional product development team. Students in each group will agree on their individual role (e.g. supplier management, material selection, product development, marketing, production and sustainability). Each team will develop a product brief (this can be informed by assignment 1). The brief will include information on the current generation product – bill of materials, key functions, supplier information etc. Working in groups of 5 to 6 during class time, and outside of class as needed, the teams will come up with a set of recommendations for improving the sustainability of the product system. Each individual on the team will also be responsible for submitting a one page description of their area of responsibility and how it can/did influence sustainability of the product. Results will be presented in the last two class sessions.

Note: Courses may include various combinations of individual and group work. Students must demonstrate individual aptitude. It is important where collaborative work is undertaken that students be able to clearly demonstrate that individual contribution has been made. Where the evaluation for individual work is below a passing grade, that grade will be awarded for the course.

Quizzes 1, 2 (total of 20% of course mark)
Individual, marked in class by your peers and handed in. These simple quizzes will help confirm your understanding of the concepts as we progress through the course.

Summary of Course Evaluation Information
40% Assignment 1
35% Assignment 2
20% Quizzes
5% Participation and Professionalism

Course Completion Requirements
Deliverables required to pass the course:
- Assignment 1
- Assignment 2

Individual/Group Work
Courses may include various combinations of individual and group work. Students must demonstrate individual aptitude. It is important where collaborative work is undertaken that students be able to clearly demonstrate that individual contribution has been made. Where the evaluation for individual work is below a passing grade, that grade will be awarded for the course.
Course Deliverables for reviews and other due dates
All deliverables submitted late will accrue a 10% per day deduction from the determined grade, to a maximum of 3 days, from the original deadline time and date. Failure to submit within 3 days, without approval from the instructor, will result in a grade of F.

Participation and Professionalism
Active participation and professional conduct are particularly important in studio courses and will be evaluated. At the same time, when the student’s work is reviewed at the end of the course, an evaluation will be made based on one or more of the following: in class discussion; consultations with instructors; and work ethic. However, none of these evaluations will be used to raise an overall failing grade, to a passing one, based on the quality of the work.

Student Access to Exam Papers
Examinations are for evaluation purposes only and will not be returned to the student.

Academic Accommodation (Equity Services)
You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Pregnancy obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit: http://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Religious obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit: http://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Academic Accommodations for Students with Disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation. Requests made within two weeks will be reviewed on a case-by-case basis. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca PMC) for the deadline to request accommodations for the formally-scheduled exam
**Instructional Offenses / Plagiarism**
The regulations of the university require that we bring to your attention regulations on *Instructional Offenses*, descriptions of which can be found in the current *Academic Integrity Policy* available on the Student Affairs website. The policy governs the academic behavior of students. At the same time it seems that students do not always understand the meaning of plagiarism and how to avoid it.

In industrial design, ideas and concepts come from a multitude of sources to be modified and utilized in the design and development process. The student should reference sources appropriately.

**Student Responsibility**
The student is responsible for knowing the content of this course outline, the schedule of classes, assignments, and examinations; and material covered during any absence from scheduled classes.

**Changes to the Course Outline**
The course outline may be subject to change in the event of extenuating circumstances.
# Appendix A – Course Schedule

<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Learning Focus</th>
<th>Evaluation</th>
<th>Lecture</th>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan 10</td>
<td>Sustainable Development -societal and corporate context</td>
<td></td>
<td>Course Outline &lt;br&gt; Introduction to sustainable development and the circular economy &lt;br&gt; Introduction to corporate sustainability</td>
<td>The World in 2050</td>
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<tr>
<td>2</td>
<td>Jan 17</td>
<td>Sustainable products – overview impacts and benefits</td>
<td>Assignment 1 Introduced Choose topics</td>
<td>Product System &lt;br&gt; Hot spots and impacts &lt;br&gt; Sustainable Product Strategy</td>
<td>What is a Sustainable Product</td>
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<td>3</td>
<td>Jan 24</td>
<td>Sustainable design concepts and tools (1)</td>
<td>Life cycle assessment, life cycle management, cradle to cradle 4Rs</td>
<td>Life Cycle Mapping</td>
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<td>4</td>
<td>Jan 31</td>
<td>Sustainable design concepts and tools (2)</td>
<td>Quiz 1</td>
<td>Eco- efficiency/effectiveness &lt;br&gt; Total Cost of Ownership, Environmental Management Systems,</td>
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<td>5</td>
<td>Feb 7</td>
<td>Sustainable and eco-design strategies</td>
<td>Eco-Design Wheel &lt;br&gt; Social responsibility considerations</td>
<td>Exploring Scenarios</td>
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<td>6</td>
<td>Feb 14</td>
<td>Standards and guidelines</td>
<td>Assignment 1 Due Assignment 2 Introduced – Choose Topics Assignment 2 Due &lt;br&gt; Introduce – Choose Topics</td>
<td>Design standards, manuals and guides &lt;br&gt; Guest Lecture</td>
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<td>7</td>
<td>Feb 28</td>
<td>Software tools</td>
<td>Automated sustainable design tools pros and cons</td>
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<td>8</td>
<td>Mar 7</td>
<td>Materials and sustainability</td>
<td>Sustainability Attributes of Materials</td>
<td>Responsible sourcing priority risks</td>
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<td>9</td>
<td>Mar 14</td>
<td>Packaging</td>
<td>Quiz 2</td>
<td>Sustainable Packaging Coalition Guidelines &lt;br&gt; Guest Lecture</td>
<td>Packaging Redesign Exercise</td>
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<td>Mar 21</td>
<td>Special topics</td>
<td>Trade-offs</td>
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<td>Social Life Cycle Assessment</td>
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<td>Mar 28</td>
<td>Assignment 2 preparation</td>
<td>Guest lecture</td>
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<td>Apr 4</td>
<td>Assignment 2 presentations</td>
<td>Assignment 2 Due-first set of presentations</td>
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<td>Groups</td>
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<td>Apr 11</td>
<td>Assignment 2 presentations (Cont’d)</td>
<td>Assignment 2 – second set of presentations</td>
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<td></td>
<td>Reflections on sustainability and design</td>
<td>Groups</td>
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