THE UNIVERSITY OF SOUTHERN CALIFORNIA
Marshall School of Business
DSO 505 (16298) – Sustainable Supply Chains – Fall 2017

Time:	Wednesdays, 5:00-8:00 pm	**Room:**	BRI202
Instructor:	Dr. Greys SOŠIĆ	**Office:**	Bridge Hall 401E
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Office hours:	Wednesday, 3:30-4:30 pm Thursday, 5:00-6:00 pm	**Skype hours:**	by request (for online section)

COURSE SCOPE AND OBJECTIVES

Environmental issues and sustainability efforts can open many opportunities for businesses—product innovation can lead to first-mover advantage, environmental product differentiation can open new markets, green sourcing and waste reduction can reduce operating cost, and so on. At the same time, they can present significant challenges—for instance, governments and communities are imposing higher standards on pollution, resource exploitation, etc.

This course aims to provide students with an understanding of the sustainability challenges and opportunities facing supply chains today. We will look at some of the factors that are contributing to the adoption of sustainability strategies, such as legislations that are penalizing negative environmental and social impacts, and society's expectations of business in terms of health, human rights, and the environment. The supply chains today cannot be concerned only with creating shareholder value; their performance is also measured in terms of social, environmental and economic impact. The main topics covered in the course are:

- Sustainability concepts and frameworks
- Sustainable design of products
- Closed-loop supply chains
- Supplier management
- Facilities management
- Renewable energy
- Facilities and locations decisions
- Transportation decisions
- Strategic sustainability implementation.

The class format includes lectures, case discussions, simulations, and movie clips.

COURSE MATERIALS

Required: *Course Reader* (CR) – Package of cases and readings available at USC bookstore. In the syllabus, a number such as CR#5 refers to 5th article in sequence in the course reader.

Digital version of the course reader can be purchased at www.universitycustompublishing.com

Handouts (HO): Handouts posted on the Blackboard.

Recommended:

- *Climate Shock: The Economic Consequences of a Hotter Planet* by G. Wagner, M.L. Weitzman, Princeton University Press, 2015.
- *This Changes Everything: Capitalism vs. The Climate* by N. Klein, Simon & Schuster, 2014.
- *Cradle to Cradle: Remaking the Way We Make Things* by W. McDonough, M. Braungart, North Point Press, 2002.

- *The Responsible Company* by Y. Chouinard and V. Stanley, Patagonia Books, 2012.
- *Reinventing Fire: Bold Business Solutions for the New Energy Era,* by A. Lovins, Chelsea Green Publishing, 2011.
- *Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value, and Build Competitive Advantage* by D.C. Esty, A.S. Winston, Yale University Press, 2006.
- *Earth, Inc.: Using Nature's Rules to Build Sustainable Profits*, G. Unruh, HBP, 2010.
- *The Ecology of Commerce: A Declaration of Sustainability* by P. Hawken, Harper Paperbacks, 2010.
- *Natural Capitalism* by P. Hawken, A. Lovins, L.H. Lovins, Little, Brown and Company, 2008.

... and many others... You can also look at a number of journals, such as *Science*, *Nature*, *Scientific American*, etc.

COURSE POLICIES

The course will be broadcasted live, and the recordings will be posted online 90 min after the class ends. You can access both by going to the Blackboard.
This course covers both quantitative and qualitative materials, and uses cases for discussion of issues and illustration of approaches. We will use Excel as a modeling/solution finding tool when addressing several topics. Active participation in class is important throughout the course. To ensure everyone's participation, I may at times resort to cold calling. If you are watching live, you can share your comments with class; if you watch the recordings, you can email me your thought before or after class, or you can contact me through Skype. I will also consider participation in the Discussion board on the Blackboard.
If you attend the class in person, you should arrive to classroom on time. If you have conflicting schedules that prevent you from that, please let me know at the beginning of the semester.

GRADING

Group case report (1)	15%
Individual submissions (5 out of 8)	15 %
Group simulation project	15%
Test	45%
Class participation	10%

GROUP CASE REPORT

Please form teams of up four persons within the first two weeks; you will be working in these teams for the group assignments. Use the "Group" option on the Blackboard to join one of the teams.
The case is to be discussed within your team and you will submit (as a team) a written report. This Syllabus provides some suggested questions that you should address in your analysis. Each team is required to submit a report on one case study (Cook Composites in week 6). Case write-up should be at most 4 pages and single-spaced (11 or 12 point font), with appendices attached (not included in the number of pages). It should be submitted on-line through the Blackboard, along with the Excel files used in your analysis. You will also need to enter some of the main results of your analysis separately on the ForClass, following the link on the Blackboard.
When preparing your report, imagine that you, as a consultant, have to study an organization, to identify the main issues it faces, and to propose a set of recommendations. Your written report should begin with an executive summary, about half page long, summarizing the most important problems and your recommendations (something a busy executive would read and understand what the report is about). The rest of the report should be organized as follows:

1. Brief description of the company and its environment

2. Brief description of the problems and issues to be addressed (the questions in the syllabus related to the specific case should guide you in identifying those issues).
3. Recommendations and implementation plan.
4. Analysis that discusses why the recommendations will solve the problems identified.

You may choose to organize the report differently; however, please ensure that the above aspects are covered and the report is well organized with clear section and sub-section headers. Please avoid repetition of case facts and long expositions (remember the page limit)! Consider what you believe are the most important factors (and why). General solutions to specific problems will get you little credit. Both quantitative and qualitative analysis is important. Creativity in analysis and suggestions that are grounded in case facts will be given high credit. Please state any assumptions made clearly. Remember that your models are usually based on the forecasted demand and that different parameters and costs in the models are estimated (forecasted), so it is useful to provide some what-if analysis that considers, e.g., different possible demand scenarios, changes in cost estimates, etc.

INDIVIDUAL (SHORT) SUBMISSIONS

In addition to the cases for which you are required to submit group reports, we will be discussing other cases and articles. You should be prepared for class discussion, and this Syllabus provides some suggested questions that you should address. For the individual submissions, follow the link on the Blackboard and enter the required information before the class on the ForClass website. Your grades for individual submissions will be posted on the ForClass website. The objective of the short submission is to ensure that you prepare the case. For that reason, no late submissions will be accepted.

As long as your answer shows that you have given sufficient thought to the analysis, you will get full credit. Note that this in general requires answers that are longer than one sentence. Each submission is worth up to 3 points, and the maximum number of points you can obtain for individual submissions is 15. If your total exceeds 15 points, it can improve your participation grade (note that in this case, each additional submission does not increase your participation by 3 points).

GROUP SIMULATION PROJECT

During week 1, we will discuss issues related to sustainability, which include the tragedy of the commons and depletion of natural resources. This will prepare you for a renewable resource management simulation, Fishbanks, during week 3. Each team will play the role of a fisher and seek to maximize their net worth as they compete against other teams and deal with variations in fish stocks and catch. You will be able to buy, sell, and build ships; decide where to fish; and negotiate with one another. A 36-minute video with game description is available at
https://mitsloan.mit.edu/LearningEdge/simulations/fishbanks/Pages/Video.aspx
The video will explain how your net worth is calculated, what impacts your catch, how can you change your fleet size, etc. Please do not register your teams on the Fishbanks website before the class; I will create all class teams.

For the simulation exercise, you should bring your laptops to class (one player per team). With your group, before coming to class (in week 3), you should watch the video and decide on your resource management strategy with the goal of maximizing your net worth. This includes:

1. How will you prepare yourself to start fishing? What will your boat acquisition strategy be? What will your target fleet size be?
2. Do you plan to build your ships or to buy them at the auction? What is the highest price that you would want to pay for a ship at an auction? Do you plan to sell any ships?
3. What will your boat allocation be? Will you stay on the same location (coast/deep sea) in all periods?
4. How do you plan to engage your competitors? How do you plan to negotiate with them? Do you want to but from them? Sell to them?

5. What are the potential obstacles you will face as you try to maximize your net worth? Can you propose any possible approaches for dealing with them?

You should prepare report "Simulation analysis part 1" that describes and explains your analysis of the questions above and submit it through the Blackboard before the exercise (before class in week 3). There is no restriction on report length.

After the simulation, we will discuss your performance and decisions. You should prepare report "Simulation analysis part 2" that describes your decisions, actions of your classmates, results, and what you learned from the exercise (that is, what, if anything, should have been done differently by your team and/or other teams). Report should be submitted through the Blackboard by week 4; there is no restriction on report length.

Note that the project grade depends on multiple factors: pre-game analysis, post-game analysis, and your actual performance in the simulation exercise.

GROUP ASSIGNMENT EVALUATION

Team assignments provide a valuable learning experience–how to work effectively and efficiently in groups, learning from others, and honing your ability to communicate to others. Although your team's grade depends on each member's efforts, some students can be tempted to let others carry their load. In order to provide an incentive for all students to make maximum contributions to the study group, you will be asked to grade each team member's contributions. Your group grades will be adjusted to obtain an individual grade based on feedback about performance provided by other members of the group (see the group assessment forms posted on the Blackboard). If you do not submit your group assessment form, it is assumed that you have assigned a rating of 100% to all your group members. The forms can be submitted in person or via e-mail, but no later than the exam date.

TEST

The test is scheduled for week 8. The questions will have several formats: multiple choice/single answer, multiple choice/multiple answers, and problems.

For the on campus students, the exam will be closed book; however, you can prepare a "cheat-sheet"—one letter-sized sheet of paper hand-written on both sides (for a total of 2 hand-written pages). I will remove all printed or photocopied material!

Online students will take the exam on the Blackboard; you will have a 24 hour window in which to take the exam, but once you start, you have to complete the exam in one two-hour sitting.

If there are extenuating circumstances that prevent you from taking the test, you must discuss the reason with me before the time of the test. You will not be given a make-up test unless you obtain a permission from me in advance. In addition, you must be able to document the extenuating circumstance. If you miss the test due to a medical emergency that can be documented and verified, then a make-up test will be given. Otherwise, a grade of zero will be given for the missed test. Note that a make-up test cannot be taken before the actual test date!

GRADING

Graded work will be posted on the Blackboard and ForClass. Disputes over graded material should be brought to my attention as soon as possible.

GETTING HELP

If you have questions about any aspect of the course, you can always talk to me. If it is a quick question, you can contact me before or after the class, or during the break. If you need more time or privacy, on campus students can come to my office hours. If you cannot make my office hours, you can contact me and we can arrange for an alternative time. Online students can talk to me through Skype. The best way to reach me is by e-mail.

CLASS PARTICIPATION

Class participation requires that you do the assigned readings, analyze the cases based on the questions given and participate actively in class. I prefer substantive comments based on good analysis rather than brief, general comments that add little to the discussion and learning. Be prepared to defend your suggestions or solutions!

If you are reluctant to talk in class or if you are not physically attending, but would like to show your preparation, please provide me with your analysis/comments through email. This may include material related to the topics covered in class from your work experience, from additional articles/videos that you have found, readings on the Blackboard, etc. Online students can also contact me through Skype, by arranging a time window that works for them and me.

I also encourage you to participate in the Discussion board on the Blackboard.

As a part of the participation I will also track your attendance; for on-campus students it will be through Arkaive app. Please download the App to your smartphone and enable location, enter enrolment code H07X and check into class each week.

NOTICE ON ACADEMIC INTEGRITY

The use of unauthorized material, communication with fellow students during an examination, attempting to benefit from the work of another student, and similar behavior that defeats the intent of an examination or other class work is unacceptable to the University. It is often difficult to distinguish between a culpable act and inadvertent behavior resulting from the nervous tensions accompanying examinations. Where a clear violation has occurred, however, the instructor may disqualify the student's work as unacceptable and assign a failing mark on the paper.

Academic dishonesty includes: (*Faculty Handbook*, 1994: 21-22):

- Examination behavior - any use of external assistance during an examination shall be considered academically dishonest unless expressly permitted by the teacher.
- Plagiarism - the appropriation and subsequent passing off of another's ideas or words as one's own. If the words or ideas of another are used, acknowledgment of the original source must be made through recognized referencing practices.
- Other types of academic dishonesty - submitting a paper written by or obtained from another, using a paper in more than one class without the teacher's express permission, obtaining a copy of an examination in advance without the knowledge and consent of the teacher, changing academic records outside of normal procedures and/or petitions, using another person to complete homework assignments without the knowledge or consent of the teacher.

FOR STUDENTS WITH DISABILILITIES

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. - 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

STATEMENT ON TECHNOLOGY USE

Please note that communication devices such as cell phones, smart phones, tablets, etc. capable of sending and/or receiving electronic communication and all entertainment devices are to be turned off and kept off throughout the class session. Receiving or sending communication or entertainment during class disrupts the learning environment and is rude to those around you.

Course plan at a glance (tentative)

Week	Topic	Readings	Submission
1	Introduction – What is sustainability? Sustainable supply chains		
2	Carbon footprint Design for environment	Levi Strauss (CR#1)	Short #1 –Carbon footprint calculation (p.7, under Week 2) Short #2 – Levi Strauss (q.1)
3	Fishbanks		Group project -Simulation analysis part 1
4	Green sourcing Facility location and transportation	Starbucks (CR#2) FIJI (CR#3) Nestle Turns Milk Into Water as California Drought Rages (HO)	Short #3 – Starbucks (q.2) Short #4 – Fiji (q.2) Group project -Simulation analysis part 2
5	Sustainable transportation Renewable energy	Kaiser Permanente (CR#4)	Short #5 – Kaiser (q.2)
6	Facilities - Green building End-of-life management	Genzyme Center (CR#5) Cook Composites (CR#6)	Short #6 – Genzyme (q.3) Group #1 – Cook Composites
7	Bringing it together	Wal-Mart (CR#7) Nike (CR#8)	Short #7 – Wal-Mart (q.2) Short #8 –Nike (q.6)

Detailed course plan

Week 1 Introduction--What is sustainability?; Sustainable supply chains

Week 2 Design for environment; Cradle to cradle

Readings:

- *Levi Strauss & Co.: Driving Adoption of Green Chemistry* (Berkeley case #B5867)
  Discussion Questions:
  1. *What internal and external factors is LS&Co. responding to with the Screened Chemistry Program? How is this program different from other chemical management strategies within the textile industry?*
  2. How can LS&Co. advance its screened chemistry approach? Who are the key partners? What are the largest barriers to the adoption of LS&Co.'s Screened Chemistry approach? Is there a role for business, NGOs, and governments outside of the apparel industry?
  3. Who should bear the responsibility and cost for screening chemistries? Who stands to gain from having chemicals screened for safety? Are there ways to share this cost?
  4. What leverage does ZDHC have on the apparel industry? Is ZDHC the best avenue for LS&Co. to advance its Screened Chemistry Program?
  5. Traditional approaches to corporate strategy emphasize the competitive nature of business with the objective to achieve a "competitive advantage". Porter's 5 Forces model depicts companies within an industry in a series of competitive battles with their industry peers and their suppliers. How might these traditionally competitive-based views of business hinder widespread adoption of LS&Co. Screened Chemistry approach across the apparel industry? What might be done to overcome this?

❖ ***Carbon footprint assignment****:* Go to the Carbon Footprint Calculator webpage (http://www.carbonfootprint.com/calculator.aspx), calculate your carbon footprint, and submit your results. What contributes the most to your personal carbon footprint? Were you surprised with any of the resulting carbon emissions?

Week 3 Renewable resource management simulation

(Bring your laptops to class)

➢ **Simulation analysis part 1 due at the beginning of the class**

Week 4 Supply management; Facility location and transportation

Readings:

- *Starbucks Corporation: Building a Sustainable Supply Chain* (Stanford case #GS-54)
  Discussion Questions:
  1. What are the main issues that Starbucks faced with its supply base in 2005? How did it approach this problem?
  2. *What are the main benefits from C.A.F.E. for Starbucks? For its suppliers?*
  3. What are the main challenges in implementation of C.A.F.E.?
  4. How are sustainability-related sourcing issues faced by Starbucks different from those faced by, say, Apple or GM?

- *FIJI Water: Carbon Negative?* (HBS #9-611-049)
- *Nestle Turns Milk Into Water as California Drought Rages*, BW (5/12/2105)
  Discussion Questions:

1. When the Resnicks acquired FIJI water in 2005, the bottled water industry was very crowded. Yet, FIJI water soon became the bestselling imported bottled water in the United States. What accounts for FIJI Water's success?
2. *What is greenwashing, and why do companies engage in greenwashing? How do you know when a claim is greenwashing*?
3. In light of the lawsuit, what should FIJI Water do? Should it amend its carbon negative strategy? Why did FIJI's carbon negative strategy encounter such opposition?
4. Should FIJI continue bottling water in Fiji? Should they modify their CSR and/or supply chain strategy?
5. Should Nestle continue bottling water in California? Should they modify their CSR and/or supply chain strategy?

- **Simulation analysis part 2 due at the beginning of the class**

Week 5 Sustainable transportation; Renewable energy

Readings:

- *Kaiser Permanente: Linking Renewable Energy and Healthcare* (Michigan case # W04C81)
  Discussion Questions:
  1. What are the advantages of being the first mover in an industry when it comes to renewable technologies? What are potential drawbacks?
  2. *How did government regulations shape KP's energy and sustainability ventures? Should the government do more/less to support investments like the ones that KP is considering?*
  3. How could KP build a business case around renewable energy partnerships and what could this mean for the healthcare industry as a whole?
  4. How could KP's model be extrapolated to smaller hospitals, pharmaceutical companies, insurers, or health-focused NGOs?
  5. Who is responsible for increasing public awareness of the connection between climate change and health? How should these parties increase awareness?

Week 6 ;Facilities - Green building; End-of-life management

Readings:

- *Genzyme Center (A)* (HBS #9-610-008)
  Discussion Questions:
  1. If you were a major stakeholder at Genzyme, what would you think of Genzyme's interest in green building?
  2. If you were Rick Mattilla, would you recommend that Genzyme make the additional investments required to enable Genzyme Center to achieve LEED Platinum status? Why or why not? What are the alternatives?
  3. *If Genzyme decided to make the investment to achieve LEED Platinum status, what decision criteria should guide the decision of which features to select? Based on these criteria, which green features would you chose?*
  4. Looking ahead to other building projects, what green building policy should Genzyme adopt? Should the policy differ for offices, labs, and manufacturing sites? Should the company adopt the same policy globally?

- *Cook Composites and Polymers Co.* (HBS #9-608-055)
  Discussion Questions:
  CCP faces three options for addressing its rinse styrene waste stream:
  (a) Continue business as usual, sending its rinse styrene to cement kilns;
  (b) Sell its rinse styrene on a waste exchange; or

(c) Proceed with developing the concrete coating that uses its rinse styrene (BPS).

1. What criteria should Mike Gromacki consider when deciding whether to pursue the waste exchange or the concrete-coating by-product? If you were Mike, what would you recommend to management to address its rinse styrene waste stream?
2. Compared to business as usual, how would selling rinse styrene to a waste exchange or producing the concrete coating by-product affect the production of gel coats?
3. Compared to business as usual, what are the financial implications of selling rinse styrene to a waste exchange or of producing the concrete coating by-product?
4. Compared to business as usual, how would you evaluate the relative environmental impact of producing the concrete coating by-product? When considering carbon dioxide (CO_2) emissions, consider the impacts system-wide (that is, not just at CCP's factory). What tradeoffs are involved? For each pound of rinse styrene diverted from cement kilns to create concrete coatings, by how much do CO_2 emissions rise or fall? Assume that CCP's sales of concrete coatings would substitute for sales by other concrete coating producers (that is, CCP's sales would not alter the total sales quantity in the concrete coatings market).

➢ **Case study report on Cook Composites due at the beginning of class**

Week 7 Bringing it together

Readings:

- *Wal-Mart's Sustainability Strategy* (Stanford case #OIT 71)
  Discussion Questions:
  1. Given the fact that Wal-Mart's customers generally are unwilling to pay a premium for environmentally friendly products, how is the company deriving business value from its sustainability strategy?
  2. *As evidenced by Exhibit 9, Wal-Mart's sustainability strategy has generally been very profitable. However, two initiatives described in the case benefit the environment, but decrease Wal-Mart's profits—holding recycling/take-back events as part of its e-waste project, and reducing its prices on CFLs and foregoing incandescent light bulb sales. How would you justify pursuing them?*
  3. How is Wal-Mart motivating its suppliers to share information about and continuously reduce the environmental impacts of products and processes? How can it stimulate the development of disruptive, breakthrough innovations?
  4. Imagine that you are Andy or Tyler, evaluating the progress of the electronics, seafood, and textiles networks. What factors explain the success (or lack of success) of these networks?

- *Nike: Sustainability and Labor Practices 1998-2013* (Stanford case # IB-106)
  Discussion Questions:
  1. How did Nike's sustainability strategy evolve through time?
  2. Describe Nike's efforts in DfE.
  3. Describe Nike's sustainability efforts in sourcing and supply management.
  4. Describe Nike's sustainability efforts in location selection.
  5. Describe Nike's sustainability efforts in energy use.
  6. *How did Nike measure its sustainability efforts?*