Columbia University School of Professional Studies
Master of Science in Sustainability Management

# SUMA PS5197 Financing the Clean Energy Economy
# Spring 2019, Mondays 6:10-8:00pm
# 3 Credits

**Instructor:** Curtis Probst, CFA; csp2138@columbia.edu (cell, if urgent: 646 645-6595)
**Office Hours:** By appointment (email to schedule), preferably before or after class; normally meet at SUMA offices at 2929 Broadway, 5th Floor
**Response Policy:** Email is my preferred mode of communication (normal response the same or next business day)

## Course Overview

We need to transition towards a more environmentally-sustainable society given both pollution and its health effects, and the impacts of extreme weather and climate change. The production and consumption of energy is the largest contributor to these concerns, and so the transition to a clean energy economy is essential. At the same time, given the energy needs of the world's growing population, affordability and energy security are also critical issues. New technologies and effective policies are needed to help drive increased deployment of renewable energy and energy efficiency.

Finance is increasingly being recognized as a key lever to drive the implementation of clean energy. Without the ability to attract the requisite capital, it is difficult to scale renewable energy and energy efficiency technologies. In order to meet the climate targets articulated in the 2015 Paris climate conference, annual clean energy investment would likely need to increase to over $1 trillion. Fortunately, public and private sector capital providers have begun to respond. For example, in 2018, over $150 billion of green bonds were issued in the global capital markets to fund clean energy investments. Furthermore, in several nations and in a few states and cities, green banks have been formed as public-private partnerships to fund clean energy initiatives. Even for governments and institutions that ascribe less value to the environmental benefits, many see significant investment opportunities in clean energy, and the ability to create new jobs and improve economic productivity. While the level of interest and creativity in financing the clean energy economy is high, there is a need for continued growth and innovation.

This course focuses on the finance and market aspects of the clean energy economy, and integrates technology, policy and finance to provide an understanding of both the opportunities and challenges. This course focuses on renewable energy generation, as mass electrification using clean generation sources is necessary to sustain our energy-dependent lives and economies. It also looks at energy efficiency, including two specific end-uses of energy that are responsible for the majority of emissions: personal vehicles and buildings. Throughout the course, finance will be analyzed as a barrier to, or enabler of, greater adoption of clean energy.

Interactive lectures, and guest speakers where appropriate, will cover these topics in twelve classes: The course begins with three classes providing a basic understanding of the U.S. electricity market: (1) historical context and the role of finance, (2) energy fundamentals and current state of energy markets, and (3) clean energy and grid integration. The next three classes describe financial aspects of clean energy: (4) key finance concepts, (5) financial modeling of power projects, and (6) modeling other clean energy initiatives. Armed with an understanding of the electricity sector and finance, students then integrate those two topics with six classes that discuss: (7) challenges of the clean energy economy, (8) electricity pricing and financing distributed energy resources, (9, 10) clean energy financing mechanisms, (11) electric vehicles and (12) building energy efficiency. The final two classes (13, 14) will be reserved for group presentations.

Course assignments will include financial models, problem sets, case studies, and a final group presentation. The financial modeling will be designed to consider the varying levels of student experience. An important aspect of the course is for students to learn some of the analytical tools used by industry practitioners to make investment decisions. While no specific financial modeling experience is required, students should have basic spreadsheet skills or be prepared to learn them.

As the course progresses, students will learn to appreciate the roles of technology, policy, and finance in the transition to a clean energy economy. Upon completion of this class, students should understand the fundamentals of the U.S. electricity sector, the role of clean energy, the opportunities and limitations of finance, and have an appreciation of different mechanisms to support clean energy finance.

The course is designed for both students with a limited background in finance but with an interest in building that skill set, and for students with prior backgrounds in finance that are seeking to apply those skills to the financing of the clean energy economy. This course is approved for the Certificate in Sustainable Finance requirement.

## Learning Objectives

By the end of this course students will be able to:

- Describe how the existing electricity markets function in the U.S., and how clean energy technologies are developing within, and apart from, these markets
- Assess the implications of larger adoption of clean energy technologies to the broader electric grid
- Summarize some of the existing business models and financial techniques for bringing clean energy to markets
- Create basic financial models for evaluating clean energy opportunities and demonstrate good technique in the development of these models
- Discuss some of the key opportunities and challenges faced in transitioning to clean energy in general, and more specifically, to electric vehicles and energy-efficient buildings
- Identify mechanisms that can be used to support the development and deployment of clean energy

Considering the breadth of the energy and financial markets, and the rapidly evolving nature of each, the goal is not to learn about every means of financing clean energy. The course's objective is to provide students a new level of comfort in discussing the role of finance in the transition to a clean energy economy. Students will focus on several examples of that transition through the class materials, and may choose a specific area in which they have personal interest for the group presentation.

## Readings

Required:

American Wind Energy Association. "Wind Facts at a Glance", 2018. Web. 6 Jan 2019. https://www.awea.org/wind-101/basics-of-wind-energy/wind-facts-at-a-glance (1 page)

California ISO. "What the duck curve tells us about managing a green grid", 2016. Web. 6 Jan 2019. https://www.caiso.com/Documents/FlexibleResourcesHelpRenewables_FastFacts.pdf (4 pages)

Clean Energy States Alliance. *A Homeowner's Guide to Solar Finance: Leases, Loans, and PPAs,* November 2018, pp. 1-16. Web. 6 Jan 2019. http://www.cesa.org/assets/2015-Files/Homeowners-Guide-to-Solar-Financing.pdf (18 pages)

Federal Energy Regulatory Commission. *Energy Primer: A Handbook of Energy Market Basics* November 2015; pp. 1-4, 35-56. Web. 6 Jan 2019. http://www.ferc.gov/market-oversight/guide/energy-primer.pdf (26 pages)

Fitzgerald, Garrett, Chris Nelder and James Newcomb. *Electric Vehicles as Distributed Energy Resources*. Rocky Mountain Institute, June 2016, pp. 5-9. Web. 6 Jan 2019. http://www.rmi.org/pdf_evs_as_DERs (5 pages)

Fitzgerald, Garrett et al. *The Economics of Battery Energy Storage: How multi-use, customer-sited batteries deliver the most services and value to customers and the grid. Executive Summary*. Rocky Mountain Institute, October 2015. Web. 6 Jan 2019. https://d231jw5ce53gcq.cloudfront.net/wp-content/uploads/2017/05/TheEconomicsOfBatteryEnergyStorage-ExecutiveSummary.pdf (8 pages)

Hansen, Lena, Virginia Lacy and Devi Glick. *A Review of Solar PV Benefit & Cost Studies, 2nd Edition.* Rocky Mountain Institute, September 2013, pp. 1-19. Web. 6 Jan 2019. http://www.rmi.org/elab_empower (19 pages)

Lazar, Jim. "Teaching the 'Duck' to Fly, Second Edition." The Regulatory Assistance Project, February 2016, pp. 5-9. Web. 6 Jan 2019. http://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-teachingtheduck2-2016-feb-2.pdf (5 pages)

Lazard. *Lazard's Levelized Cost of Energy Analysis-Version 12.0.* November 2018. Web. 6 Jan 2019. https://www.lazard.com/media/450784/lazards-levelized-cost-of-energy-version-120-vfinal.pdf (20 pages)

Lazard. *Lazard's Levelized Cost of Storage Analysis-Version 4.0.* November 2018. Web. 6 Jan 2019. https://www.lazard.com/media/450774/lazards-levelized-cost-of-storage-version-40-vfinal.pdf (60 pages)

National Conference of State Legislatures. "State Policies for Power Purchase Agreements", 10 July 2015. Web. 6 Jan 2019. http://www.ncsl.org/research/energy/state-policies-for-purchase-agreements.aspx (5 pages)

NC Clean Energy Technology Center. "Commercial Guide to the Federal Investment Tax Credit for Solar PV", December 2015. Web. 6 Jan 2019. http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2015/12/CommercialITC_Factsheet_Final-dec2015update.pdf (6 pages)

Norton Rose Fulbright. "Corporate Renewable PPAs – a framework for the future?", May 2017. Web. 6 Jan 2019. http://www.nortonrosefulbright.com/knowledge/publications/149117/corporate-renewable-ppas-a-framework-for-the-future (5 pages)

Solar Energy Industries Association. "Solar Market Insight Report 2018 Q4" [summary], December 2018. Web. 6 Jan 2019. https://www.seia.org/research-resources/solar-market-insight-report-2018-q4 (18 pages) **no need to purchase report; review the summary only**

U.S. Energy Information Administration. "Basics"; *Electricity Explained: Electricity in the United States,* 20 April 2018. Web. 6 Jan 2019. http://www.eia.gov/energyexplained/index.cfm?page=electricity_in_the_united_states#tab1 (1 page)

U.S. Energy Information Administration. "Generation, Sales & Capacity"; *Electricity Explained: Electricity in the United States,* 20 April 2018. Web. 6 Jan 2019. http://www.eia.gov/energyexplained/index.cfm?page=electricity_in_the_united_states#tab2 (1 page)

U.S. Energy Information Administration. "Basics"; *Energy Use for Transportation,* 23 May 2018. Web. 6 Jan 2019. http://www.eia.gov/Energyexplained/?page=us_energy_transportation#tab1 (1 page)

U.S. Energy Information Administration. "In Depth"; *Energy Use for Transportation,* 22 June 2018. Web. 6 Jan 2019. http://www.eia.gov/Energyexplained/?page=us_energy_transportation#tab2 (1 page)

Wilson Sonsini Goodrich & Rosati. *Innovations and Opportunities in Energy Efficiency Finance,* May 2014. Web. 6 Jan 2019. https://www.wsgr.com/publications/PDFSearch/WSGR-EE-Finance-White-Paper-14.pdf (32 pages)

Wilson Sonsini Goodrich & Rosati. *Project Finance Primer for Renewable Energy and Clean Tech Projects,* August 2010. Web. 6 Jan 2019. https://www.wsgr.com/PDFSearch/ctp_guide.pdf (17 pages)

Optional:

Investopedia. "Internal Rate of Return – IRR", 10 January 2019. Web. 13 Jan 2019. https://www.investopedia.com/terms/i/irr.asp (1 page)

Investopedia. "Net Present Value – NPV", 26 December 2018. Web. 13 Jan 2019. https://www.investopedia.com/terms/n/npv.asp (1 page)

Investopedia. "Understanding the Time Value of Money", 20 December 2018. Web. 13 Jan 2019. https://www.investopedia.com/articles/03/082703.asp#axzz1SrWnKE40 (1 page)

Investopedia. "Weighted Average Cost of Capital (WACC)", 3 August 2018. Web. 13 Jan 2019. https://www.investopedia.com/terms/w/wacc.asp (1 page)

NARUC. *Distributed Energy Resources Rate Design and Compensation*. November 2016. Web. 6 Jan 2019. https://www.naruc.org/rate-design/ (181 pages)

## Resources

The readings have been carefully chosen to provide up-to-date resources on the topics covered in this course. For additional materials, or for academic support more generally, students may wish to consider the resources listed below.

*Columbia University Library*
Columbia's extensive library system ranks in the top five academic libraries in the nation, with many of its services and resources available online: http://library.columbia.edu/.

*SPS Academic Resources*
The Office of Student Life and Alumni Relations (SLAR) provides students with academic counseling and support services such as online tutoring and career coaching: http://sps.columbia.edu/student-life-and-alumni-relations/academic-resources.

## Course Requirements (Assignments)

I. Statement of purpose (4%)
Provide a one-page (double-spaced) statement of purpose on what you are looking to get out of the class. Please highlight any particular skills you can contribute to the class or to your group. Please also identify one or more clean energy technologies, currently being deployed, in which you have a particular interest (this may help you identify a topic for the group presentation and fellow group members). Please include your name and UNI on your submission.

II. Six assignments during the semester (66%)
Assignment 1 (4%): Will involve the creation of a simple Excel financial model based upon a series of instructions. **Please pay attention to the financial modeling "best practices" discussed at the end of Class 2**. The model will focus on basic Excel concepts and good modeling techniques, and introduce certain financial concepts discussed in greater detail later in the course. Students will be required to provide a soft copy of the Excel spreadsheet and print out the model in a manner that is legible, labeled appropriately and formatted neatly.

Assignment 2 (10%): Will involve the creation of another financial model(s), this time used to calculate the levelized cost of energy for a specific technology(ies). This model will take the basic financial concepts and good modeling techniques practiced in Assignment 1, and apply them to specific clean energy applications.

Assignment 3 (10%): Will involve the creation of a financial model for a clean energy project. The model will focus on more complex model design, and will also build on the skills practiced in Assignments 1 and 2.

Assignment 4 (14%): Will involve, similar to Assignment 3, the creation of a financial model for a clean energy project. This model will involve the application of more concepts based on the discussion of project finance.

Assignment 5 (14%): Will be a set of quantitative and qualitative short answer questions. These questions will discuss the basic elements of: U.S. electricity markets, clean energy technologies, integration of clean energy into the grid and financial techniques for bringing clean energy to market.

Assignment 6 (14%): Will involve an analytical case study (which may include a financial model) of one aspect of the transition to clean energy. Students will be expected to identify both the opportunities and the challenges, and what if any financing mechanisms might accelerate deployment of the technology.

III. Group Presentation (25%)
Will be a group presentation summarizing the key aspects of a particular clean energy technology or project. The deliverable will be the in-class presentation, plus the associated PowerPoint slides. The targeted group size and length of presentation will depend, in part, upon final enrollment in the class, but would likely be groups of 4-6 students and presentations 15-20 minutes in length. The majority of the grade (20%) will be based upon instructor/CGA evaluation of the assignment, and 5% based upon peer evaluations provided by fellow group members who will evaluate your relative contribution.

IV. Class Participation (5%)
Attendance alone does not count toward your participation grade. Contributing to class discussions means enhancing the quality of the class experience for yourself and others. It involves making relevant, useful and non-obvious comments, or posing pertinent questions, in clear and succinct language.

## Evaluation/Grading

The final grade will be based on your performance on the various components of the course, weighted as follows:

Statement of Purpose = 4%
Assignment #1 = 4%
Assignment #2 = 10%
Assignment #3 = 10%
Assignment #4 = 14%
Assignment #5 = 14%
Assignment #6 = 14%
Group Presentation = 25%
Class Participation = 5%

The following clarifies how points awarded for course requirements will be translated into letter grades for the course:
A+ is for extraordinary work, above and beyond; A = 93-100; A- = 90-92.99; B+ = 87-89.99; B = 84-86.99; B- = 80-83.99; C+ = 77-79.99; C = 74-76.99; C- = 70-73.99; D = 65-69.99; F = below 65

## Course Policies

*Participation and Attendance*

You are expected to do assigned readings, attend all class sessions, participate in class, and engage actively and cooperatively with others in completing the final group presentation. In particular, please be especially attentive to guest speakers, and develop appropriate questions in advance. Your participation will require that you answer questions, defend your point of view, and challenge the point of view of others. If you need to miss a class for any reason, please contact the instructor and CGAs in advance.

*Late work*

There will be no credit granted to any written assignment that is not submitted on the due date noted in the course syllabus without advance notice and permission from the instructor. Assignments submitted late with permission from the instructor will normally be marked down one letter grade absent extenuating circumstances.

*Citation & Submission*

Written assignments must cite sources (use any acceptable citation style e.g., APA, Chicago, MLA), and be submitted to the course website (not via email). For certain assignments (if so indicated), students may also be required to submit printed hard copy.

## Course Schedule/Course Calendar

| **Session, Date** | **Topics and Activities** | **Readings (due this day); required unless otherwise indicated** | **Assignments (due on this date)** |
|---|---|---|---|
| One<br>1/28 | **History of the Energy Industry and the Importance of Finance**<br><br>Topics:<br>*Introductions<br>*Goals/ Context<br>*Course Key Themes/ Goals<br>*Class Deliverables<br>*Brief History of Energy Industry<br>*Importance of Finance<br><br>Activities:<br>*Course Overview<br>*Lecture<br>*Discussion | n/a | -- |
| Two<br>2/4 | **Energy Fundamentals and Electricity Markets in 2019**<br><br>Topics:<br>*Forms of Electricity Production<br>*Basic Terminology<br>*Production Efficiency<br>*LCOE<br>*Variable Costs<br>*Fixed Costs<br>*Electricity Prices<br><br>Activities:<br>*Recap of Prior Lecture<br>*Lecture<br>*Discussion | Federal Energy Regulatory Commission. *Energy Primer: A Handbook of Energy Market Basics* November 2015; pp. 1-4, 35-56. (26 pages)<br><br>U.S. Energy Information Administration. "Basics"; Electricity Explained: Electricity in the United States, 20 April 2018. (1 page)<br><br>U.S. Energy Information Administration. "Generation, Sales & Capacity"; Electricity Explained: Electricity in the United States, 20 April 2018. (1 page) | -- |

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| Three<br>2/11 | **Clean Energy and Grid Integration**<br><br>Topics:<br>*Grid context of clean energy technologies<br>*Major energy "products"<br>*Role of renewable generation<br>*Net metering and load-based resources<br>*Role of storage and EVs in grid integration<br><br>Activities:<br>*Recap of Prior Lecture<br>*Lecture<br>*Discussion<br>*Class Exercise | American Wind Energy Association. "Wind Facts at a Glance", 6 January 2019. (1 page)<br><br>California ISO. "What the duck curve tells us about managing a green grid", 2016. (4 pages)<br><br>Fitzgerald, Garrett et al. The *Economics of Battery Energy Storage: How multi-use, customer-sited batteries deliver the most services and value to customers and the grid*. Executive Summary. Rocky Mountain Institute, September 2015, pp. 1-8. (8 pages)<br><br>Solar Energy Industries Association. "Solar Market Insight Report 2018 Q4" [summary], December 2018. (18 pages) | Statement of purpose<br><br>Assignment #1: Basic Excel financial model |
| Four<br>2/18 | **Overview of Key Financing Concepts**<br><br>Topics:<br>*Basic financial concepts<br>*Capital structure (debt vs. equity)<br>*Importance of market conditions<br>*Different types of financing<br>*Tax aspects of financing<br>*Project finance<br>*Basics of financial modeling<br><br>Activities:<br>*Recap of Prior Lecture<br>*Lecture<br>*Discussion<br>*Model-Building Demonstration | *For the Lazard report, please review key charts and assumptions to get an understanding of LCOE. It is not necessary to read each page in detail.*<br><br>Lazard. *Lazard's Levelized Cost of Energy Analysis-Version 12.0.* November 2018. (20 pages)<br><br>NC Clean Energy Technology Center. "Commercial Guide to the Federal Investment Tax Credit for Solar PV", December 2015. (6 pages)<br><br>Optional:<br><br>*For those without previous finance knowledge, Investopedia.com has articles on relevant topics including:*<br><br>Investopedia. "Internal Rate of Return – IRR", 10 January 2019. (1 page)<br><br>Investopedia. "Net Present Value – NPV", 26 December 2018. (1 page)<br><br>Investopedia. "Understanding the Time Value of Money", 20 December 2018. (1 page)<br><br>Investopedia. "Weighted Average Cost of Capital (WACC)", 3 August 2018. (1 page) | |

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| Five<br>2/25 | **Financial Modeling for Energy Projects**<br><br>Topics:<br>*How to do a financial model of an energy project<br>*How to determine a levelized cost of energy (LCOE)<br>*The overall structure of project finance transactions<br><br>Activities:<br>*Recap of Prior Lecture<br>*Lecture<br>*Discussion<br>*Group Formation | *For the Lazard report, please review key charts and assumptions to get an understanding of how LCOE is calculated and communicated. It is not necessary to read each page in detail.*<br><br>Lazard. *Lazard's Levelized Cost of Storage-Version 4.0*. November 2018. (60 pages)<br><br>National Conference of State Legislatures. "State Policies for Power Purchase Agreements", 10 July 2015. (5 pages)<br><br>Wilson Sonsini Goodrich & Rosati. *Project Finance Primer for Renewable Energy and Clean Tech Projects,* August 2010. (17 pages) | Assignment #2: Levelized cost of energy models |
| Six<br>3/4 | **Financial Modeling – Other Clean Energy Measures**<br><br>Topics:<br>*Other examples of how to model clean energy<br>*How to model financial transactions<br>*Four different examples of financing clean energy assets<br><br>Activities:<br>*Recap of Prior Lecture<br>*Lecture<br>*Discussion<br>*Group Meeting Time | Clean Energy States Alliance. *A Homeowner's Guide to Solar Finance: Leases, Loans, and PPAs*, November 2018, pp. 1-16. (18 pages) | |
| Seven<br>3/11 | **Opportunities and Challenges of Green Energy**<br><br>Topics:<br>*Applicability of project finance in developing renewables<br>*Ways in which early-stage companies/ technologies are financed<br>*Financing of mature/ late-stage companies<br><br>Activities:<br>*Recap of Prior Lecture<br>*Lecture<br>*Discussion<br>*Guest Speaker I | n/a | Assignment #3: Financial model for a clean energy project |
| 3/18 | **- NO CLASSES –** | | |

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| Eight<br>3/25 | **Rate Design and the Financing of Distributed Energy Resources**<br><br>Topics:<br>*Basics of setting rates for electricity<br>*Complexities of rate design<br>*Distributed energy resources (DERs)<br>*Rate design issues that are relevant to DER economics and possible future rate design approaches<br><br>Activities:<br>*Recap of Prior Lecture<br>*Lecture<br>*Discussion | Hansen, Lena, Virginia Lacy and Devi Glick. *A Review of Solar PV Benefit & Cost Studies, 2nd Edition.* Rocky Mountain Institute, September 2013, pp. 1-19. (19 pages)<br><br>Lazar, Jim. "Teaching the "Duck" to Fly, Second Edition." The Regulatory Assistance Project, February 2016, pp. 5-9. (5 pages)<br><br>Optional (as a reference guide):<br><br>NARUC. *Distributed Energy Resources Rate Design and Compensation*. November 2016. | Assignment #4: Financial model for a clean energy project |
| Nine<br>4/1 | **Financing Mechanisms for Clean Energy**<br><br>Activities:<br>*Recap of Prior Lecture<br>*Lecture<br>*Discussion<br>*Guest Speaker II | Norton Rose Fulbright. "Corporate Renewable PPAs – a framework for the future?", May 2017. (5 pages)<br><br>Wilson Sonsini Goodrich & Rosati. *Innovations and Opportunities in Energy Efficiency Finance,* May 2014. (32 pages) | |
| Ten<br>4/8 | **Financing Mechanisms for Clean Energy (continued)**<br><br>Activities:<br>*Recap of Prior Lecture<br>*Lecture<br>*Discussion<br>*Guest Speaker III | | Assignment #5: Quantitative and qualitative short answer questions |
| Eleven<br>4/15 | **Electric Vehicles and the Grid**<br><br>Topics:<br>* Importance of transportation in general, and automobiles in particular, as a use of energy and source of emissions<br>*Different alternatives to traditional automobiles<br>*EV opportunities and challenges<br><br>Activities:<br>*Recap of Prior Lecture<br>*Lecture<br>*Discussion<br>*Guest Speaker IV | Fitzgerald, Garrett, Chris Nelder and James Newcomb. *Electric Vehicles as Distributed Energy Resources*. Rocky Mountain Institute, June 2016, pp. 5-9. (5 pages)<br><br>U.S. Energy Information Administration. "Basics"; Energy Use for Transportation, 23 May 2018. (1 page)<br><br>U.S. Energy Information Administration. "In Depth"; Energy Use for Transportation, 22 June 2018. (1 page) | Assignment #6: Analytical case study |
| Twelve<br>4/22 | **Building Energy Efficiency**<br><br>Topics:<br>*Importance of buildings in aggregate energy use and some of the various factors | | |

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| | driving energy use<br>*Differences between new buildings and existing buildings<br>*Additional benefits of building energy efficiency and the general process<br>*Case studies of building energy efficiency<br><br>Activities:<br>*Recap of Prior Lecture<br>*Lecture<br>*Discussion<br>*Class Exercise | | |
| Thirteen<br>4/29 | **GROUP PRESENTATIONS DAY 1**<br><br>Activities:<br>*Group Presentations/Q&A | n/a | Group Presentation: first set of teams* |
| Fourteen<br>5/6 | **GROUP PRESENTATIONS DAY 2**<br><br>Activities:<br>*Group Presentations/Q&A | n/a | Group Presentation: second set of teams* |

* Group presentation order based first on team preferences, then random selection where necessary to finalize order.

## School Policies

*Copyright Policy*

Please note -- Due to copyright restrictions, online access to this material is limited to instructors and students currently registered for this course. Please be advised that by clicking the link to the electronic materials in this course, you have read and accept the following:

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials. Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specified conditions is that the photocopy or reproduction is not to be "used for any purpose other than private study, scholarship, or research." If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of "fair use," that user may be liable for copyright infringement.

*Academic Integrity*

Columbia University expects its students to act with honesty and propriety at all times and to respect the rights of others. It is fundamental University policy that academic dishonesty in any guise or personal conduct of any sort that disrupts the life of the University or denigrates or endangers members of the University community is unacceptable and will be dealt with severely. It is essential to the academic integrity and vitality of this community that individuals do their own work and properly acknowledge the circumstances, ideas, sources, and assistance upon which that work is based. Academic honesty in class assignments and exams is expected of all students at all times.

SPS holds each member of its community responsible for understanding and abiding by the SPS Academic Integrity and Community Standards posted at http://sps.columbia.edu/student-life-and-alumni-relations/academic-integrity-and-community-standards. You are required to read these standards within the first few days of class. Ignorance of the School's policy concerning academic dishonesty shall not be a defense in any disciplinary proceedings.

*Accessibility*

Columbia is committed to providing equal access to qualified students with documented disabilities. A student's disability status and reasonable accommodations are individually determined based upon disability documentation and related information gathered through the intake process. For more information regarding this service, please visit the University's Health Services website: http://health.columbia.edu/services/ods/support.