Greening New Construction & Major Renovation

ARC 6913, Sec 708F/G

Summer 2017

Credit Hours: 3

Weekly online meetings, Wednesdays (7:00 pm-8:00 pm)

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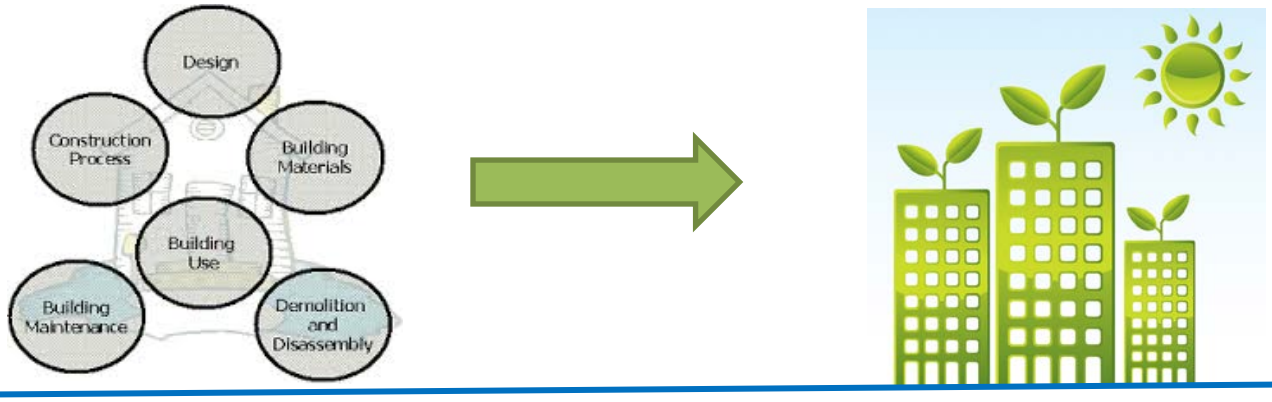
Sustainability is best thought of as a change process, rather than an end state. US Executive Order 13423 states that sustainability "means to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations." In order to achieve such conditions, new ways of designing, constructing and operating buildings and facilities must be identified. *GSA*



Course Description:

This is a multidisciplinary immersion course that utilizes the built environment design and construction to educate and prepare students to become green building leaders and sustainability-focused citizens. This course will arm students with the skills, knowledge and experience needed to be effective communicators, project managers, critical thinkers, problem solvers, engaged leaders, and team players in the field of sustainability.

Students will learn about the tools and green building technologies application for design and construction of high performance building, economics and market development associated with the application of green building rating systems with the focus on Leadership in Energy and Environmental Design (LEED), and successful course completion can prepare the students for LEED™ V4 Green Associate and BD+C specialty exams credentials.

Course Objectives:

- Understand and communicate the purpose, value, and benefits of building green
- Identify tools and strategies for planning, design, construction and operation of green building
- Learn about green building rating systems with a focus on Leadership in Energy and Environmental Design (LEED), its application and certification process.
- Support and encourage integrated design through synergies across the rating system
- Learn the best practices for design, construction and operation related to:
    - Planning and development
    - Sustainable site
    - Energy and water conservation
    - Material use and selection
    - Health and wellbeing of the occupants.
- Review and prepare for LEED Green Associate exam requirements
- Understand project team members' role in the design and construction of high performance building

Course Format:

Delivery Method:

- Web based lectures and resources.
- Weekly online discussion.
- Course material is available at: https://lss.at.ufl.edu/ (incl. Power Point slides, reading material in pdf format, Case studies, video clips; assignments, and hyperlinks).
- Email and message (bulletin/announcements) in Canvas are used for communication.
- The class will be divided into teams of two members to encourage team work and collaboration.

Weekly online meetings via Canvas: Wednesdays *7:00 PM* (Eastern Daylight Time). This session is to answer questions, discuss reading material, and present market updates. Students are expected to complete the readings and view the material before this meeting.

Course Website: https://lss.at.ufl.edu. This course is on Canvas. It will contain all course material including readings, lecture slides, assignment instructions, exams, announcements, and lecture recording. All course material will be posted before class. Each team will utilize Canvas to create own team page and all the assignments submission and final project will be through Canvas. This is a paperless course.

Communication: barmagh@ufl.edu email is the best and preferred method of communication.

Required Reading:

- LEED for Building Design and Construction Reference Guide (short version) and other material, posted on Canvas.
- Recording, PowerPoint slides and selected publications posted on Canvas.

- Students can purchase from USGBC the electronic and full LEED V4 BD+C reference Guide for $50. You need to let me know to give you ordering information.

Tools and Resources:

- **Building Green**, **www.buildinggreen.com;** is an excellent resource for the latest in sustainable built environment, cases studies, articles, materials, and more. This is a membership based site, where University is a member.
That means you have full access to all the site content.
  - To access this site while on campus, you will automatically be logged in the site and can use it.
  - To access the site while you are off campus, you can remotely access the site using VPN.
  - To access some campus resources when you are physically off campus, you may need to install UF's VPN. The UF VPN Service is designed to allow University Faculty, Staff, and Students to securely "tunnel" into campus over other networks, such as their home internet connection, and access services as if they were on campus. Basically, it lets your computer appear as if it were located physically on campus. To install, go to vpn.ufl.edu. To get more information about VPN, you can visit: https://connect.ufl.edu/it/wiki/Pages/glvpn.aspx

- **LEEDuser,** http://www.leeduser.com ; this is another resource with tools and examples on each LEED credit. UF has a membership to this resource too, you can access on campus. If you need to access off campus through UF VPN Service, follow above steps.
- **GSA**, https://sftool.gov/.

Recommended Books: *Not required*

- Natural capitalism: by Paul Hawken, Amory B. Lovins, L. Hunter Lovins. This is an excellent book with useful facts about environment and business's triple bottom line, creating the next industrial revolution.
- The Green Studio Handbook: Environmental Strategies for Schematic Design by Alison Kwok, Walter Grondzik

Course Expectations

- Students to complete watching weekly module and the weekly assigned reading.

- Students attend weekly discussion prepared for active participation. A quality learning experience in this course rests heavily on interaction and exchange of ideas related to green design and practices.
- This is a reading-intensive course. Active student engagement with the reading material and associated class discussions will be an important component of your grade (see grading policy below).

Attendance and Make-up Quizzes and Assignments:

- Students who are absent from weekly discussion for any reason will assume complete responsibility for obtaining information missed during their absence.
- Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Grading:

15 points, Exam 1 (June 26, 2017), on Canvas
15 points, Exam 2 (July 17, 2017), on Canvas
30 points, Final presentation and report (July26, 2017). This will start at 6:00 pm-8:30pm
16 points, Quizzes, see e-learning quizzes tab, (4*8=32/2=16)
14 points, Assignments, see e-learning assignments tab
10 points, Weekly online participation and attendance
100 points total

Grade Scale:

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
Numeric Grade	93-100	90-92	87-89	83-86	80-82	77-79	73-76	70-72	67-69	63-66	60-62	0-59
Quality Points	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	0.67	0.0

See the following link for UF's grade policy:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Exams:

Exams will be on Canvas. Each exam will cover the material that has been covered to the exam date. These are non-cumulative exams.

Final Presentation and Reports:

Research green buildings strategies and best practices. Must submit a PowerPoint presentation in addition to the paper. Below list of topics that may be selected, or select other topics of your choice related to building green.
This paper must be minimum eight pages, single space, and 12 points font. The paper and PowerPoint are due July 26, 2017.
By June 15th each team must submit their final project topic.

Or, submit a 3-5 video/skid and a presentation on a topic of your choice.

Potential Project Topics

- **Building Envelope;** Insulation Material, Glazing, Green Roofs, Green Walls
- **Building Exterior & Interior Lighting;** Day lighting, Top lighting, Sidelight, Light Shelves, Internal Reflectance, Shading Devices, Electrical Lighting
- **Heating;** Direct gain, Indirect gain, Solar thermal energy system, Ground source heat pump
- **Cooling;** Natural and mechanical
- **Energy Production;** Plug load, Energy recovery systems, photovoltaic, Wind, Geothermal
- **Water & Wastewater;** Reclaimed water, water harvesting (rain, condensate, gray), Pervious surface, Bioswales

- **Site and transportation, green roof, LID, etc.**
- **Living building challenge**
- **Net zero energy building**
- **Zero carbon emission building**
- **The economics of building green**
- **WELL rating system**
- **PEER rating system**

Assignments: Two assignments will be given including:

- Indoor water calculations
- Energy Star Target Finder

Weekly Team Presentation, class participation:

A team will lead discussion on the reading material of the week. Each team is graded based on their participation.

Activities and Assignments, Keep it paperless

- Check e-learning for the material and presentations that will be covered weekly.
- Check your e-mail for e-learning announcements.
- Read assignments before each weekly discussion.
- All assignments turned in electronically through e-learning

Academic Honesty and intellectual Integrity:

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. "* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment*." It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php"

Accommodations for Students:

Students with disabilities, register with the Dean of Student Office for accommodations, which will provide documentations to the instructor.
University counseling services and mental health services: 392-1575, http://www.counseling.ufl.edu/cwc/Default.aspx
University Police Department: 392-1111 or 9-1-1 for emergencies.

Online course evaluation:

Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at https://evaluations.ufl.edu Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu.

Need Help? Don't hesitate to ask

PROBLEMS WITH E-learning in Canvas

For issues with technical difficulties for E-learning in Canvas, contact the UF Help Desk at:
Learning-support@ufl.edu
(352) 392-HELP(4357) - select option 2
https://lss.at.ufl.edu/help.shtml

For any other helps contact your instructor.

Other resources are available at http://www.distance.ufl.edu/getting-help for:

- Counseling and Wellness resources
- Disability resources
- Resources for handling student concerns and complaints
- Library Help Desk support

Should you have any complaints with your experience in this course please visit http://www.distance.ufl.edu/student-complaints to submit a complaint.

Philosophy Statement

Never doubt that you as an individual and as a member of a small team of thoughtful citizens can change the world for the better; the reality is that is the only way things get changed. Your inspiration and innovation in green design, construction, and operation can make a difference not only in your life but in your community, city, and the world.

Disclaimer

This syllabus represents our current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.

Course Schedule

See below weekly class schedule;

Date		Topic	Team
Module 1: Introduction to Green Building			
Week 1	5/15	- Welcome & Introduction - Review syllabus - Review use of Canvas, course files, material, and paperless approach - UF campus sustainability overview and status - Review green building rating systems with focus on LEED™ V4; BD+C - Green building/LEED™ V4; BD+C goals, benefits and certification - Why build green? The course is focused on multidisciplinary team approach.	

		Teams - Identify project team managers, members & responsibilities ***Introduction to the following tools:*** - ***www.buildinggreen.com*** - ***www.Leeduser.com*** **Video 2014,** The blueprint for a carbon-free and just built environment by 2050. https://vimeo.com/101548831 ***Assignment: Establish a USGBC account***	
Module 2: Project Scope, planning & administration, and the Integrative Proces			
Week 2	5/22	**Project Planning and Assessment** ***Readings*** ***- Getting Started*** ***- Minimum Program Requirement*** ***- Rating system selection*** ***- Integrative Process*** ***Review sample*** - Owners Program Requirement (OPR) and Basis of Design (BOD) - Occupancy, Full time equivalent (FTE), part time & transient calculations - Categories and credits structure - Identify pre-requisites and credits ***- LEED™ boundary*** ***- Integrative Approach*** Review LEED™ V4; BD+C checklist ***- Review pre-requisites and credits*** ***- Leading a sustainability charrette*** **http://www.usgbc.org/sampleforms** **Check for resources; www.leeduser.com** National Charrette Institute; http://www.charretteinstitute.org/resources.html Whole Building Design Guide; National Institute of Building Science: https://www.wbdg.org/resources/charrettes.php	
Module 3: Location & Transportation			
Week 3	5/29	Discuss strategies used for the site selection, density, and transportation including: - LEED for Neighborhood Development - Sensitive Land Protection - High Priority Site - Surrounding Density and Diverse Uses - Access to Quality Transit - Bicycle Facilities - Reduced Parking Footprint - Green Vehicles **Check for resources; www.leeduser.com** **Reading; Location & Transportation category**	Team 1

		Module 4: Sustainable Site Related Issues	
Week 4	6/5	Discuss strategies for the project site selection and impact including: - Construction Activity Pollution Prevention - Site Assessment - Site Development - Protect or Restore Habitat - Open Space - Rainwater Management - Heat Island Reduction - Light Pollution Reduction **Check for resources; www.leeduser.com** **Reading; Sustainable Site category**	Team 2
		Module 5: Water Conservation Strategies Inside and Outside	
Week 5	6/12	Water efficiency and conservation strategies overview for: - Outdoor Water Use Reduction - Indoor Water Use Reduction - Building-Level Water Metering - Outdoor Water Use Reduction - Indoor Water Use Reduction - Cooling Tower Water Use - Water Metering - Review WaterSense at http://www.epa.gov/watersense/our_water/start_saving.html **Check for resources; www.leeduser.com** **Reading; Water Conservation category** **EPA interactive water budget tool;** **http://www.epa.gov/watersense/water_budget/application.html** **water budget data finder; http://www.epa.gov/WaterSense/new_homes/wb_data_finder.html** **WaterSense® Water Budget Approach;** **http://www.epa.gov/watersense/docs/home_final_waterbudget508.pdf** **Calculate your personal water saving;** **http://www.epa.gov/watersense/our_water/start_saving.html#tabs-3** ***Assignment 1: water use calculation***	Team 3
		Module 6: Energy Conservation Strategies	
Week 6	6/19	Discuss strategies for energy conservation measure including***:*** - Fundamental Commissioning and Verification - Minimum Energy Performance - Building-Level Energy Metering - Fundamental Refrigerant Management - Enhanced Commissioning - Optimize Energy Performance - Advanced Energy Metering - Demand Response - Renewable Energy Production - Enhanced Refrigerant Management	Team 4

		- Green Power and Carbon Offsets **Check for resources; www.leeduser.com** **Reading; Energy and Atmosphere category**	
Module 7: Energy Star Rating and Commissioning (Cx)			
Week 7	6/26	- Demonstrate Energy Star rating - Review Cx including fundamental and enhanced Cxing, Cx tools, and types of Cx. ***Assignment 2: Energy Star Target Finder***	
Exam 1, on Canvas			
Module 8: Material and Resources			
Week 8	7/3	Discuss strategies for: - Storage and collection of recyclables - Construction and demolition waste management planning - Building life-cycle impact reduction  **http://calculatelca.com/software/impact-estimator/** - Building product disclosure and optimization - environmental product declarations - Building product disclosure and optimization - sourcing of raw materials - Building product disclosure and optimization - material ingredients **Check for resources; www.leeduser.com** **Reading; Material & Resources category**	Team 5
Module 9: Indoor Environmental Quality/Health & Wellbeing			
Week 9	7/10	Discuss strategies for building indoor environmental quality and providing be better environment for the health and wellbeing of the occupants including: - Minimum Indoor Air Quality Performance - Environmental Tobacco Smoke Control - Enhanced Indoor Air Quality Strategies - Low-Emitting Materials - Construction Indoor Air Quality Management Plan - Indoor Air Quality Assessment - Thermal Comfort - Interior Lighting - Daylight - Quality Views - Acoustic Performance - Harvard Study Shows Elevated CO2 Levels Directly Affect Human Cognitive function, 10/26/2015 http://www.hsph.harvard.edu/news/press-releases/green-office-environments-linked-with-higher-cognitive-function-scores/ **Check for resources; www.leeduser.com** **Reading; Indoor Environmental Quality category**	Team , all

Module 10: Innovation and Regional Priority and LEED GA exam review				
Week 10	7/17	- Discuss strategies for Innovations in the project - Determine the Regional Priority for this project **Reading; Regional Priority and Innovation category** - Review LEED™ V4; BD+C accreditation exam - Registration for the exam - Preparation for the exam - Review sample exam questions	Team, all	
Exam 2, on Canvas				
Final Presentations				
July 26th		Final Presentations and reports This session will be longer than the one hr. that we have for weekly discussion.	20 min. per team	All Tean