

BCN 4905 + 5905

## Sustainable Housing: Putting the 3 E's into Residential Practice

Spring 2016

**INSTRUCTOR:** Sherry Ahrentzen, Ph.D.  
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**OFFICE:** Rinker 315

**OFFICE HOURS:** Tuesdays: 2:00-5:00; and by  
appointment + by appointment

**CONTACT:** For email messages to instructor, use: ahrentzen@ufl.edu  
For phone messages to instructor, use: 352.273.1229

**CLASS SESSIONS:** Mondays, 4:05-6:00 (Periods 9, 10)  
Wednesdays, 4:05-4:55 (Period 9)

**ROOM:** Rinker 220

### PURPOSE OF COURSE

Sustainability is said to come from the balance and intersection of "the 3 e's": environment, economics and social equity. Post-industrial residential planning and building practices of recent decades have often neglected to address even one of these e's, resulting in residential buildings and landscapes that will be – or currently are – unsustainable in even the near future.

Recent efforts have produced processes, practices, and innovations to rectify this situation. Some of these residential practices try to incorporate at least one of these "e's" into the design-development-financing-construction-occupancy process; some attempt to address more than one. The premise of this course is that "sustainable" includes, but is more than building "green." And that the residential environment includes, but is more than simply a collection of individual dwellings. This course examines approaches that can advance the development and building of sustainable housing in this light.

### COURSE OBJECTIVES FOR STUDENTS

- To recognize consequences of climate change, demographic disruptions, and economic imbalances that threaten to unhinge residential stability and sustainability
- In light of these threats, to become familiar with various approaches to developing/constructing sustainable residential environments, ones that incorporate environmental, social and/or financial sustainability practices
- To understand and identify principles of active and passive sustainable building and infrastructure practices for: energy efficiency and renewables, water efficiency and reuse, ventilation, indoor air quality, waste reduction and recycling, occupant lifespan adaptability and accessibility, occupant health, financial/economic sustainability
- To compare and analyze these sustainable residential practices, identifying limitations, strengths, and contextual applications
- To examine and explain various metrics and measurements for benchmarking and performance

- To describe and compare various green building certification programs (e.g. LEED) and health-based building standards for residences/housing

## COURSE TOPICS

The course material is divided into 6 modules. The schedule and required readings for these modules and class periods are provided in separate handout. Topics within each module include:

### History and Context

What Constitutes Sustainability in a Housing Context  
Tragedy of the Commons  
History of Unsustainable Housing Practices  
Ethics of Sustainability

### Sustainable Residential Infrastructure

Location Efficiency  
Low Impact Development (LID): Bioretention, Hardscapes, Density, TOD, UHI

### Residential Structures and Systems

Vernacular/Traditional Housing Practices  
Passive Solar Design  
Systems for Efficiency + Conservation: Heating, Cooling, Ventilation, Daylighting  
Affordable and Green: Examples and Strategies of Energy Retrofits

### Green Assessments

Residential Green Certification Systems/Practices  
Performance Assessment Processes: POE, Simulation, LCA, Performance Metrics

### Social Sustainability

Demographic Disruptions  
Occupant Behavior  
From Sick Buildings to Healthy Homes  
Measures and Metrics of Building Performance for Occupant Health  
Universal Design, Lifespan Housing and Other Residential Innovations

### Economic Sustainability

Capitalism and Climate Change  
Sustainable Affordable Rental Housing Strategies  
Sustainable Ownership and Housing Financing Models

## READING MATERIAL

Readings come from a variety of sources: books, academic and professional journals, trade magazines, online videos and newsletters. Required textbook readings primarily come from two sources, both eBooks available on the library's online site:

*Fundamentals of Sustainable Dwellings*, by Avi Friedman. 2012. McGraw-Hill (e-book)  
*Sustainable Residential Development*, by Avi Friedman. 2007. McGraw-Hill (e-book)

An excellent reference book that you might consider during the semester is on reserve at Marston Science Library:

*Green Building: Principles and Practices in Residential Construction*, by Abe Kruger and Carl Seville. 2013. Delmar.

Non-textbook readings (PDFs, video clips, URL links) are available on the course Canvas site.

Required readings are listed in separate handouts. These must be completed prior to class.

## EXPECTATIONS FOR CLASS ATTENDANCE AND PARTICIPATION

Class sessions are a mixture of brief lectures/presentations by the instructor, class discussions, student presentations, hands-on assignment work, and guest speakers. You are expected to attend all classes and participate fully. The instructor will not summarize the required readings, but we will use them as a platform for discussion and critique. Your course evaluation includes attendance and participation. In order to participate fully, read all the required readings before these sessions.

Attendance is required. Arriving late to class or leaving early may be counted as an absence. Missed class sessions result in grade deductions unless there is an acceptable reason for absence according to university policies. These include: illness, serious family emergencies, special curricular requirements, military obligation, severe weather conditions, religious holidays, participation in official university activities, and court-imposed legal obligations (e.g., jury duty or subpoena). Do not bring me excuses for other reasons. To be excused, absences must be properly documented and a make-up determined. Final grade deductions begin when a student has missed 3 unexcused sessions.

Participation in class and online discussion is expected and counts towards your grade. Participation means more than simply attending class and listening; it means engaging in class discussion, verbally responding to questions and ideas posed in class. The instructor expects that you will participate in class discussion *at least* once a week. To minimize distractions, all cell/smart phones must be turned off during class sessions. Laptops and tablets are allowed in class only if used to refer to reading and assignment material. Otherwise, laptops must be turned off during class. *Failure to follow this class policy will result in reduction of your class participation grade.*

If you have trouble understanding assignments, projects, grading or course expectations, please speak to me as soon as possible – neither you nor I want to see you fall behind in this course.

## ASSIGNMENTS AND PROJECTS

There are **15 assignments** throughout the semester. These assignments are made 2-4 days in advance of the due date. The assignments related to an issue or topic discussed in class or in the readings. An example of an assignment is: from a site visit or a description in a magazine/book/webpage, locate a residence with passive solar features; graphically and verbally present that residence in class, identifying each of the passive features; and document your PPT by uploading onto Canvas.

**Projects** are more comprehensive than assignments, consisting of: precedent and information search, description, comparison, analysis, and recommendations. Deliverables include both text and graphic documentation. There are **2 projects** throughout the semester. For the second project, graduate students will have an additional component compared to that of the undergraduates. Details of all projects and due dates are provided in separate handouts; detailed instructions for each assignment will be made in class. The first project will be due before spring break; the second will be due by the last week of class and includes a class presentation.

PhD students also prepare for and undertake a class lecture (approximately 30-40 minutes) on a topic of residential sustainability that reflects their doctoral studies' concentration and specialty (i.e. project 3 for doctoral students). For example, if one's doctoral specialty is transportation, the lecture might cover location efficiency and housing proximity to public transportation as sustainable design and planning strategies. Or if the student's doctoral specialty is acoustics, the lecture might cover sustainable (i.e. green) materials, design, and products for sound and noise in multifamily residences that could be used in a manner that also enhances occupant health and safety. PhD students will work with instructor in preparing for these lectures.

**All assignments and projects are submitted electronically** to the instructor via Canvas. An assignment/project is considered late if it arrives one second past the due date. Project submissions after the stated deadline will be deducted 10% for every day late; assignment submissions, 20% for every 30 minutes late.

## GRADING POLICY AND DISTRIBUTION

Industriousness, attentiveness, a collaborative spirit with your classmates, and a passion for learning will help you produce exceptional work.

Grading distribution follows:

|                                | <u>Undergrad</u><br>% | <u>Masters</u><br>% | <u>PhD</u><br>% |
|--------------------------------|-----------------------|---------------------|-----------------|
| Class Participation            | 10                    | 10                  | 10              |
| Assignments                    | 30                    | 30                  | 25              |
| Project 1                      | 25                    | 25                  | 20              |
| Project 2, part 1 (everyone)   | 35                    | 25                  | 25              |
| Project 2, part 2 (grads only) |                       | 10                  | 10              |
| Project 3 (PhD only)           |                       |                     | 10              |
| TOTAL                          | 100%                  | 100%                | 100%            |

Attendance: Missed class sessions (including those only partially attended) result in final grade deductions unless there is an acceptable reason for absence according to university policies. Grade deductions begin when a student has missed 3 unexcused sessions.

Final grade assignments are based on:

|    |                 |
|----|-----------------|
| A  | 92.5 – 100%     |
| A- | 90 – 92%        |
| B+ | 87.5% - 89.5%   |
| B  | 82.5 – 87%      |
| B- | 80 – 82%        |
| C+ | 77.5% - 79.5%   |
| C  | 72.5 – 77%      |
| C- | 70 – 72%        |
| D+ | 67.5% - 69.5%   |
| D  | 62.5 – 67%      |
| D- | 60 – 62%        |
| F  | 59.5% and below |

## MAKE-UP POLICY

Since assignments are given at least 2 days in advance and project handouts are distributed at least three weeks before due date, it is expected that students have sufficient time to complete the work. There are no make-up projects or assignments except in cases of documented excused absences.

## GETTING HELP

For issues with technical difficulties for e-learning in Sakai, please contact the UF Help Desk at:

- [Learning-support@ufl.edu](mailto:Learning-support@ufl.edu)
- (352) 392-HELP - select option 2
- <https://lss.at.ufl.edu/help.shtml>

Should an assignment submission occur after the due date solely as a result of technical issues, a request to the instructor for consideration **must** be accompanied by the ticket number received from LSS when the problem was

reported to them. The ticket number will document the time and date of the problem. You must e-mail your instructor within 24 hours of the technical difficulty.

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.

## UF AND GENERAL POLICIES

**Academic misconduct.** Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at <http://www.dso.ufl.edu/students.php>.

**Accommodating students with disabilities.** Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodations. Students with disabilities should follow this procedure as early as possible in the semester.

**Course evaluations.** Students are expected to provide feedback on the quality of instruction in this course based on ten 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>.

**Netiquette: communication courtesy.** All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. Please refer to: <http://teach.ufl.edu/docs/NetiquetteGuideforOnlineCourses.pdf>

**Religious observances.** Please inform the instructor of any religious holidays or other days of special religious significance that may interfere with your participation in this class so that she can accommodate these events.

**Special consideration.** The principle of equal treatment of all students is a fundamental guide in responding to requests for special consideration. No student shall be given an opportunity to improve a grade that is not made available to all members of the class. This policy is not intended to exclude reasonable accommodation of verified student disability or the completion of work missed due to religious observance, verified illness, or absence due to circumstances beyond your control. Reconsideration of subjective judgments of an individual student's work will be done only if all students in the class can be and are given the same consideration.

**Sexual harassment.** Sexual harassment is reprehensible and will not be tolerated by the University. It subverts its mission and threatens the careers, educational experience, and well being of students, faculty, and staff. The University will not tolerate behavior between or among members of the university community that creates an unacceptable working environment.

**Stress.** The academic year presents many opportunities as well as challenges, sometimes resulting in increased stress. If at any time you feel anxious or stressful, please contact the instructor or the university's Counseling + Wellness Center at <http://www.counseling.ufl.edu/cwc/Default.aspx>.

