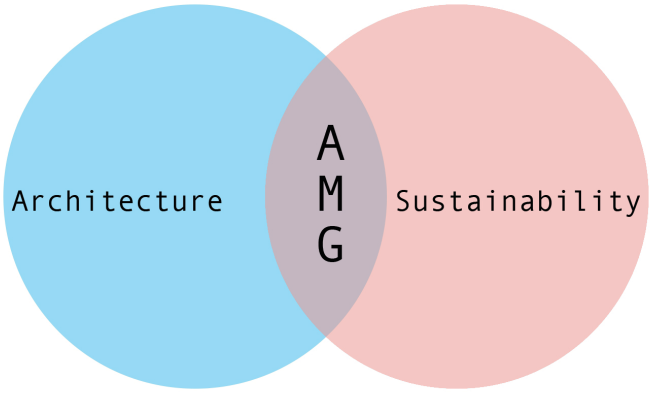
Teaching Portfolio

Alexandra **M**cDowell **G**adawski



Teaching Philosophy

I have always been fascinated by design, the process of taking an idea and turning it into a tangible object. Architecture holds a particular appeal due to the necessity of the objects created. At its most utilitarian, architecture is the provision of shelter, but it has the potential to be so much more. I perceive architecture to exist at the intersection of art and science, the fanciful and the practical.

How can architecture be taught in a way that will have a value that endures beyond the studio context? A successful architecture program does not simply train students to design buildings. Fundamentally, architecture studios are teaching students to solve problems and develop innovative solutions. Students are guided towards developing their own unique process for assessing a situation and proposing a solution. A robust process and parameters for decision-making can then be transferred to many other areas. Intermediate steps are considered as important as the final result. Steven Holl has stated "To open architecture to questions of perception, we must suspend disbelief, disengage the rational half of the mind, and simply play and explore. Reason and skepticism must yield to a horizon of discovery." It is important to think broadly and creatively, to explore tangents and not to limit students to a preconceived outcome. Students will learn actively, thought the act of making.

Understanding the technical aspects of a subject

serves as a foundation for creative experiment. I make a point of keeping current with research developments within my field, and appreciate an opportunity to share new developments. I believe digital and handwork should exist together. Tools and materials have inherent properties that can lead to a certain set of solutions, and having competency with a greater number of tools and materials gives more methods of exploring a design problem. As computer based design becomes increasingly pervasive, there is a tendency to design based on ease of digital modeling, which can be limiting. Alternating between manual and digital work can minimize this. Architectural drawings must convey meaning that extends beyond technical representation.

The practice of architecture needs to be situated in a broader context, not only of the city, but also of the world. As the impact of consumption is increasingly made visible, it is important that sustainability is considered in all buildings and is integrated in a way that enhances the design. Ultimately architecture is about creating, and it can be difficult to reconcile a desire to design and create with concerns about consumption and environmental impact. Sustainability will be addressed in a way that makes it an intrinsic portion of the design, and will be introduced at the beginning of a design project. Bruce Mau has stated “I believe in science and art, and the promise and potential of design to bring them together to change the world” and I believe this to be true.

In tandem with studio inquiry, lectures will be given through the semester on sustainability topics linked to the

design process, moving from climate based site analysis to passive design detailing.

I have been privileged to attend a number of academic institutions. At one of the institutions I attended, the motto was “Risk Failure in Pursuit of Excellence”, which is a fantastic motto for an architecture studio. A learning environment should be created where students feel comfortable and supported in their experiments. While experimentation should always be encouraged, this should be done in a structured way, with an emphasis placed on rigor, exactitude and analysis. It must be understood that good design comes after multiple iterations and refinements. For a tangent or unsuccessful attempt to be useful, it must be evaluated. Students should feel that their contributions are valued, and comments and work are seriously and objectively critiqued. It must always be clear that critiques are focused exclusively on work, and not a personal commentary.

Sample Course Descriptions

Climate Based Passive Design

Instructor: Alexandra McDowell Gadawski
Class Size: 15
Open to: Architecture Department, Undergraduates
Elective
Fall Semester: Friday 9:00- 12:00
Bayard Ewing Building, Room 106
Estimated Cost: $150

The construction and operation of buildings is extremely resource intensive. As the ramifications of a changing climate become increasingly clear, it is important to understand the impact buildings have on the environment, and what can be done to minimize this impact. The course will begin by discussing sources of reliable climate data and methods for climate analysis. The basic physics and geometry needed to understand physical and environmental phenomenon will be reviewed. The effect of these phenomena on human comfort, and the determination of appropriate passive design techniques will be covered, with an emphasis on climate specific design. Course work will include research, in the form of weekly essays and class presentations, and will culminate in a four-week design project. The required texts will be *Introduction to Architectural Science* by Szokolay and *Sun, Wind and Light* by Brown and DeKay. A field trip will be taken to Boston to visit buildings embodying passive design principles.

Representing Architecture

Instructor: Alexandra McDowell Gadawski
Class Size: 15
Open to: All Departments, Undergraduates, Graduates
Elective
Fall Semester: Friday 1:00- 6:00
Bayard Ewing Building, Room 104
Estimated Cost: $200

This course will focus on how to convey architectural ideas. The beginning of the course will be devoted to foundational representation techniques such as perspective, plans, sections, elevation and isometrics. Once the basic graphic standards of architectural representation have been established, the focus will shift to how to embed meaning, emotion and ideas into these drawings, while maintaining

their legibility as architectural documents. The first 10 weeks will have a weekly drawing assignment. The final four weeks will be devoted to a summative drawing and the production of a portfolio. Reading will include exerts from work by Juhani Pallasmaa, John Berger and Italo Calvino. The required text will be *Design Drawing* by Francis Ching. Visits to the RISD museum to look at drawing in person will take place throughout the semester.

People Planet Profit: Triple Bottom Line Analysis for Architecture

Instructor: Alexandra McDowell Gadawski
Class Size: 15
Open to: Architecture Department, Graduates
Elective
Fall Semester: Wednesday 9:00- 12:00
Bayard Ewing Building, Room 104
Estimated Cost: $100

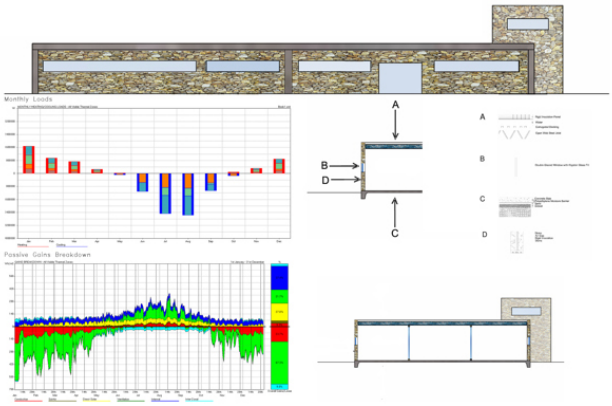
Sustainability as "development which meets the needs of current generations without compromising the ability of future generations to meet their own needs"
-The Brundtland Commission

Triple bottom line analysis, often referred to as people, planet, profit, will be discussed from a built environment perspective. The environmental impact of buildings will be considered, along with the social consequences of design. The long and short-term costs of low impact design will also be discussed. Students will be introduced to concepts of carbon finance, carbon offsets, budgeting and the basics of project management. The course will be lecture based, with weekly reading and written assignments. The final project will be the analysis of an existing studio project using this methodology. Readings will include journal articles, and selected chapters from *Carbon Finance* by Labatt and White.

Example Syllabus

Climate Based Passive Design

Rhode Island School of Design
Department of Architecture
Fall 2013
Friday 9:00 -12:00
Bayard Ewing Building, Room 106
Instructor: Alexandra McDowell Gadawski
agadawsk@risd.edu



Course Description

The construction and operation of buildings is extremely resource intensive. As the ramifications of a changing climate become increasingly clear, it is important to understand the impact buildings have on the environment and what can be done to minimize this impact. The course will begin by discussing sources of reliable climate data and methods for climate analysis. The basic physics and geometry needed to understand physical and environmental phenomenon will be reviewed. The effect of these phenomena on human comfort, and the determination of appropriate passive design techniques will be covered, with an emphasis on climate specific design. Course work will include research, in the form of weekly written assignments and class presentations, and will culminate in a four-week design project. The required texts will be *Introduction to Architectural Science* by Szokolay and *Sun, Wind and Light* by Brown and DeKay. A field trip will be taken to Boston to visit buildings embodying passive design principles.

Course Goals

At the completion of this course students will be able to:
-Understand the impact the construction and operation of buildings has on the environment
-Locate and understand climate data
-Perform simple environmental physics calculations
-Design a building using climate specific passive design techniques

Course Objectives

The student will come away from this course with:
-The ability to analyze climate data and effectively draw conclusions regarding appropriate building techniques for a specific environment
-The capacity to explain passive building techniques, and how to integrate them into the design process (5%)
-Demonstrated understanding of environmental physics (5%)
-Written assignments, in journal article format (40%)
-A design for a passive building, for inclusion into an architectural portfolio (45%)
-Experience objectively analyzing the work of other (5%)

Methods

-Lectures on topics including physics, geometry, climate and passive design techniques
-Assigned readings
-Written assignments and two short in-class student presentations
-The final project will be a design project that uses the climate analysis and passive design techniques covered in class. This project will be presented in a final critique that will take place on the last class.
-Field trip to Boston to visit buildings embodying passive design principles

Schedule

Week 1 – Friday September 14th
Introduction to Passive Design
Lecture: Basic physics and math
In class assignment: Testing in math and physics. This will be unmarked and is to gauge existing level of understanding. Based on results, tutorials may be given in certain areas. If required, tutorials will take place Monday from 7-8pm and will be voluntary.
Due Next Class:

1. Install required software
2. Purchase required texts.
3. Complete practice problems.

Week 1 Learning Outcomes: Knowledge of the math and physics required for climate calculations

Week 2 – Friday September 20th
Lecture: Sun
Due Next Class:
1. Read math review from *Foundation Math*
2. Problems on Solar Angle

Week 2 Learning Outcomes: Demonstrated ability to apply basics geometry to the calculation of solar angle

Week 3 – Friday September 27th
Lecture: Wind
Introduction to research methods and journal article formatting
Due Next Class
1. Reading from journal article on passive cooling strategies
   Question to Consider: Is passive cooling appropriate in the New England climate?
2. Paper on wind in passive design

Week 3 Learning Outcomes: Understanding of research principles and document formatting

Week 4 – Friday October 4th
Lecture: Daylight
Due Next Class
1. Reading on sunspaces
   Question to Consider: Would a sunspace improve the living environment in your current dwelling?
2. Paper on the role of daylight in passive design

Week 4 Learning Outcomes: Ability to describe sunspaces, and to identify in what conditions they are beneficial to building performance

Week 5 – Friday October 11th
Lecture: Climate
Due Next Class
1. Reading from *The Stern Review*, Chapters 1 and 13
   Question to Consider: Does an understanding of the potential of climate change impact your daily choices?
2. Collection and Analysis of Climate Data for Assigned Location

Week 5 Learning Outcomes: Differentiate climate and weather, and understand how local climate impacts design decisions

Week 6 – Friday October 18th
Lecture: History of Passive Design
Introduce Passive Design Presentation and Allocation of Topics
Due Next Class
1. Presentation on Passive Design Technique, 5 minutes per student

Week 6 Learning Outcomes: Explain evolution of passive design

Week 7 – Friday October 25th
Lecture: Thermal Comfort
Mid-Term Review (20 Minutes)
Due Next Class
1. Reading on comfort and place
   Question to Consider: How is thermal comfort considered in the place you grew up?
2. Paper on Comfort as a Cultural Construction

Week 7 Learning Outcomes: Recognize factors effecting thermal comfort

Week 8 – Friday November 1st
Lecture: Technology for Passive Design
Due Next Class
1. Reading on glass integrated photovoltaics
   Question to Consider: Have you ever visited a building with integrated renewables?
2. Paper on Building Integrated Renewables

Week 8 Learning Outcomes: Identify potential for integrating technology into the built environment

Week 9 – Friday November 8th
Lecture: Voluntary Design Standards
Case Study: Alpine Lodge by Trebersprung and Partners Architecture
Introduce Final Project Part 1: Climate Analysis
Due Next Class
1. Selection of Location for Final Design Project and Collection of Climate Data

Week 9 Learning Outcomes: Ability to analyze climate data

Week 10 – Friday November 15th
Lecture: Passive Design in the North American Context
Introduce Final Project Part 2: Passive Design Proposal
Due Next Class
1. Preliminary research and idea development for the final project

Week 10 Learning Outcomes: Determining a research trajectory

Week 11 – Friday November 22nd
Lecture: The Intersection of Climate Change and Architecture
Intermediary group review of the final project
Due Next Class
1. Continue to work on final project
2. Come prepared for Boston trip

Week 11 Learning Outcomes: Present research and design information in a way that is legible to other students.

Week 12 – Friday November 29th
No Class – Thanksgiving Break

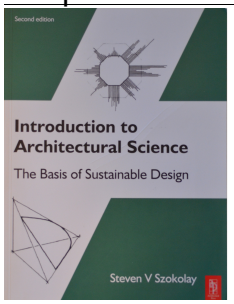
Week 13 – December 6th
Field Trip to Boston to visit buildings embodying passive design principles
Due Next Class
1. Final Presentation for Passive Design Proposal

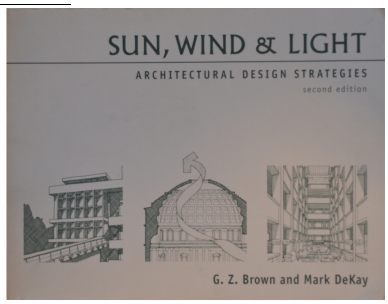
Week 13 Learning Outcomes: Recognize learned passive techniques in built form.

Week 14 – December 13th
Lecture: Case Study, Brunnenhof Housing Complex by Gigon/Guyer Architekten
Final Presentations – Passive Design Proposal, 10 minutes per student
Complete course evaluation

Week 14 Learning Outcomes: Ability to amalgamate information into a new design, and define decisions based on personal analysis.

Required Texts





Introduction to Architectural Science by Steve V. Szokolay
Sun, Wind and Light by Brown and DeKay

Indicative Reading List

These texts will be on reserve at the library.

The Stern Review by Nicholas Stern
Environmental Science in Building by McMullan and Seeley
Advanced Building Systems A Technical Guide for Architects and Engineers by Klaus Daniels
Environmental Design An Introduction for Architects and Engineers by Randall Thomas
Thermal Delight in Architecture by Lisa Heschong
Environmental Design by Randall Thomas and Max Fordham (Eds)
Architecture of the Well Tempered Environment by Reyner Banham
Foundation Maths by Anthony Croft and Robert Davison
The Good Research Guide for Small Scale Social Research Projects by Martyn Dunscombe
Ethics and the Built Environment by Warwick Fox
The Ecology of Architecture: A Complete Guide to Creating the Environmentally Conscious Building by L. Zeiher

Materials

All students will be required to download AutoCAD, Ecotect and Radiance. These programs are available free of charge to students from AutoDesk. Drafting and model making materials will be required for the final project.

Assessment

Solar Angle Problems - 5%
Written Assignments - 40%
Presentation - 5%
Final Project - 45%
Participation – 5%

A marking rubric will be distributed with each assignment. It is expected that all sources used will be properly sited. There will be a 5% daily penalty for assignments submitted late. If a student feels they require additional assistance to complete an assignment please contact the instructor in a timely manner.

Critiques

Critiques are an opportunity for students to learn to articulate and verbalize their thought on the built environment in a precise way. It is intended that it be a learning opportunity both for those presenting and those listening. All students are encouraged to discuss their peer's work in a considered and respectful way. There will be two critiques during the semester, an intermediary review and the final. At the intermediary review students are encouraged to provide concrete suggestions to assist the presenting student in moving the project forward. Students will be asked to evaluate what information is being conveyed in the drawings and models, and suggest representation techniques that could make this information read more clearly. The suitability of proposed techniques will be evaluated. At the final critique the emphasis will be on overarching themes of sustainability in housing and the implementation of passive techniques.

The participation component of the grade will be based on contribution in critiques and presentations. Designers tend to have an intuitive understanding of there own work and the rational for decisions making, but at a certain point in all projects it is necessary to convey this information to others. Using a particular passive technique may seem logical to the presenter, but the reasoning must be made clear to the audience. It can become impossible for designers to evaluate how their own work is communicating. Please support the growth of your peers design with your contributions. The greater the diversity of opinions

presented, the more likely the success of the final project.

Attendance

Attendance is mandatory. Should a situation arise where a student is unable to attend, please notify the instructor prior to class. More than two unexcused absences will be considered grounds for a failing grade.

Disability

It is recommended that students who have a cognitive or physical disability contact The Office of Student Development and Counseling Services. While this is voluntary, if a student wants accommodation they must submit a description of the disability and the required accommodation through this department. Requests cannot be submitted through the instructor.

Climate Based Passive Design

Instructor: Alexandra McDowell Gadawski

Mid-Term Review

Your considered responses are appreciated. Feedback will be used to adjust the trajectory of the course. Responses are anonymous.

Which elements of the course have most increased your understanding of passive design principles?

Have the weekly readings complemented and expanded on information presented in class?

Is the structure and pace of the lectures appropriate?
Too fast, too slow, about right?

Is the workload manageable? Approximately how many hours a week are you spending on work for this class?

Has the feedback on assignments been helpful?

Has this course impacted the way you consider environmental performance in the built environment?

Are there any changes that could be made to improve learning and increase the relevancy of the material being presented?

Please rate the following, with one meaning disagree strongly, five being agree strongly:

The classes are well organized and proceed in a timely manner.
1☐2☐3☐4☐5☐
The instructor is accessible outside of class.
1☐2☐3☐4☐5☐
I feel comfortable enough with the passive techniques to integrate them into a studio design project.
1☐2☐3☐4☐5☐
I feel confident using the math and physics presented in my own projects.
1☐2☐3☐4☐5☐
The atmosphere in class is conducive to sharing opinions and asking questions.
1☐2☐3☐4☐5☐

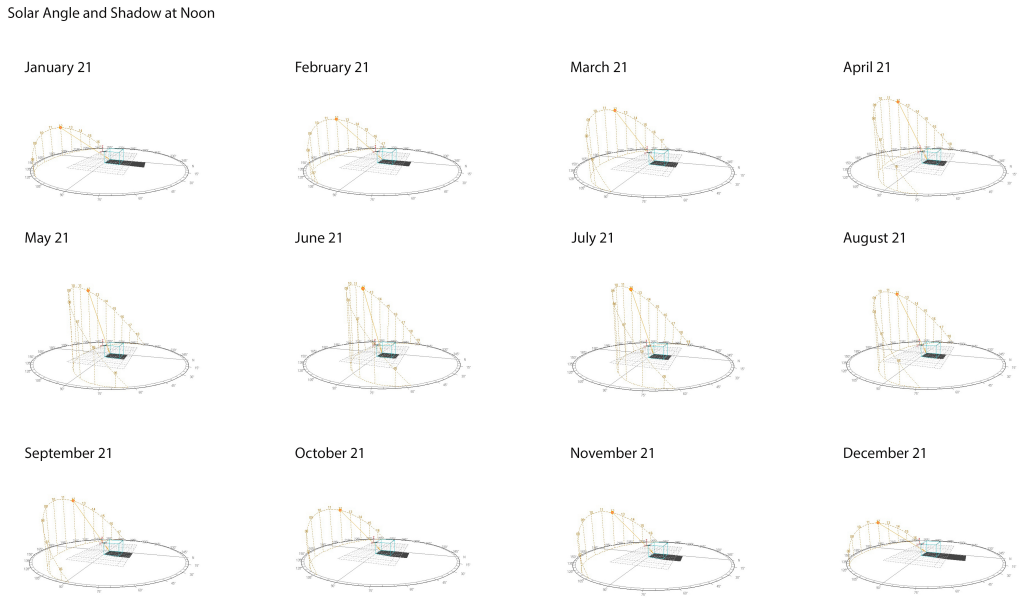
Additional Comments:

Thank you for taking the time to compete the mid-term review.

Sample Project

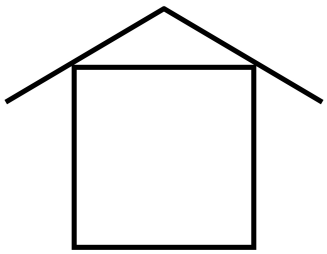
Climate Based Passive Design

Final Project
Design of a Climate Specific Passive Residential Dwelling



Introduction

"When I am working on a problem, I never think about beauty. I only think about how to solve the problem. But when I have finished, if the solution isn't beautiful, I know it is wrong." – Richard Buckminster Fuller



The construction and operation of buildings is very resource intensive. When designing low energy buildings, it can be temping to so see large-scale construction as being most impactful, but it can be argued that people interact most closely with there own homes. For many people the standard single family home is the stereotypical architectural unit. Reshaping the residential

dwelling has the power to redefine what people perceive as standard design.

What can the house be?

The final project will be the design of a passive single-family residential dwelling, in a location of the student's choice. The building must be between 1200-1600 sq. ft. and accommodate 5 people. This building should push the boundaries of environmental performance in residential architecture.

This summative project will provide students with an opportunity to use the aggregated knowledge of different passive design techniques they are have learned throughout the semester. It will be an opportunity to test learned theories in a design context. It is hoped that students will develop a research and design process that they will be able to integrate into future projects.

Goals

At the end of this project students will have the ability to:
- Understand how buildings interact with the environment
- Integrate passive techniques into a design project
- Conduct research in a way that supports the architectural design process

Outcomes

At the completion of the assignment students will have:
- The design of a passive residential dwelling to include in an architectural portfolio
- Experience in climate analysis, and a sheet summarizing climate data for a specific location
- An understanding of passive building techniques, and how to integrate them into the design process

Dates

Week 9 – Friday November 8th
Introduction to Final Project
Climate Analysis explained in detail in class.

Week 10 – Friday November 15th
Review climate data as class.

Explain in detail final design requirements.
Due: Selection of location for final design project and collection and analysis of climate data

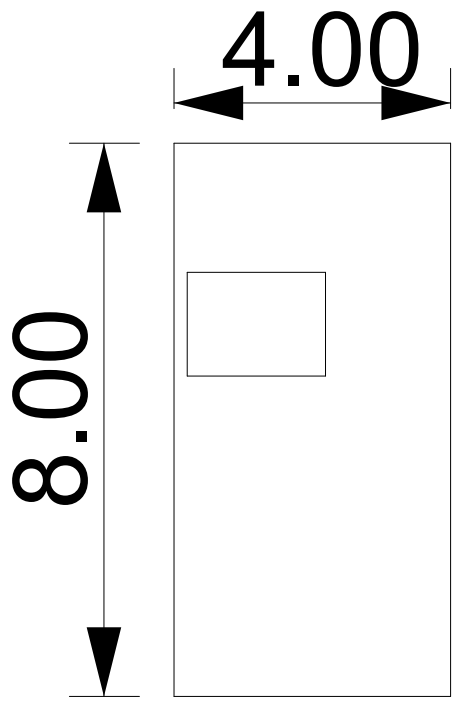
Week 11 – Friday November 22nd
Due: Preliminary research and idea development for the final project
Students will meet briefly to discussion progress with the instructor. If longer meetings are required these will be scheduled outside of class time.

Week 14 – December 13th
Due: Final Presentations – Passive Design Proposal, 15 minutes per student

Final Presentation Requirements and Format

Each student will present their work at a critique lasting 15 minutes, with the first 5 minutes given in the form of a presentation, and the final 10 minutes being a discussion.

Final requirements will include at a minimum:
- 1 Sheet of climate analysis
- Plans of each level
- 1 Cross Section
- 1 Longitudinal Section
- 1 Elevation
-Construction section through one wall
- Final Model



Process work can be shown if necessary. Additional drawing or models may be required to adequately convey the concept and building performance.

All work must be done on 18x24 inch sheets and must be oriented horizontally. Students will be given a 4 foot by 8 foot space to display their work. Care should be taken with the layout of the sheets.

Projects must be pinned up and students ready to present at the start of class. Presentation order and pin-up locations will be disseminated by email in advance of class.

Assessment

This assignment is worth 45% of the overall course grade.

The break down for the assignment is as follows.
10% Climate Analysis
80% Final Design
    70% Passive Design

    5% Practicality as a Residential Dwelling
    5% Aesthetics
10% Verbal Presentation

Basic Competency

    All minimum requirements are complete. There is clarity of ideas as conveyed in drawings and the verbal presentation. The building is appropriate for the chosen climate.

Advanced Competency

    All drawing and models necessary to explain the project in a complete way have been undertaken. The high performance of the building is demonstrated. The drawings have a high level of clarity, and while the verbal explanation supplements the drawings, the visual work could provide a stand alone explanation if required.

Resources

Climate Data

U.S. Department of Energy
http://apps1.eere.energy.gov/buildings/energyplus/weatherdata_about.cfm

Books

Introduction to Architectural Science by Steven Szokolay
Sun Wind and Light by G.Z. Brown and Mark DeKay

Example Projects

Small Eco-Homes Ed. Simone Schliefer – For inspiration and photographs
Details Magazine – For construction drawings

Suggested Supplies and Material

Drafting Pencils
Sharpener
Ruler
Architects Scale
Set Square
Parallel Ruler
White Eraser
Brush
Drafting tape
Vellum/Trace
Model Making Supplies: Basswood, corrugated cardboard, acrylic sheet, chipboard, foamcore

If you require access to the laser cutter or CNC machine be aware that time is booked one week in advance and is limited.