

COURSE DESCRIPTION

Introduction to Green Building Awareness & Weatherization

Concerns about the environment and the ways human consumption has affected local ecologies have spawned a trend toward green building across all building trades. At the same time, the American Reinvestment and Recovery Act (ARRA) is investing \$41 billion in clean energy and energy-efficiency projects. These funds will create jobs and wealth while transforming American cities to models of green living. A course in Green Building and Weatherization Awareness is relevant to the low-income, unemployed, and underemployed populations served by the MWTP not only because it gives them another skill set to succeed in the building trades, but also because it has the potential to reshape the communities within which they live – communities which are often the focus of environmental remediation and redevelopment. Consequently, this training provides the opportunity for residents to be employed right where they live.

This course is designed for individuals who need an elemental understanding of the ideology, principles, and processes of green building in order to increase their employability in the construction and environmental remediation fields. Since it is important for trainees to understand how and where a green construction career fits into the broader green movement, the curriculum is necessarily taught within the framework of sustainable development theory. Green building is presented as one part of the larger sustainable development process. Renewable energy, sustainable planning, waste management, and industry regulation are also presented so trainees will understand their link to green building and place in the sustainable development process.

The course focuses on providing trainees with a fundamental introductory awareness in green building and building weatherization. It is designed for comprehension of trainees operating at the 8th grade literacy level. The objective is to set a firm foundation of terms, concepts, and general knowledge as prerequisite to hands-on and more advanced green building techniques and applications training. The course is divided into seven sections: Section 1 – Green Building, Section 2 – Renewable Energy, Section 3 – Sustainable Planning, Section 4 – Green Materials & Techniques, Section 5 – Waste Management, Section 6 – Regulatory Agencies, and Section 7 – Weatherization. The package of materials available to teach this course include: instructor's manual, participant manual, PowerPoint® presentation with embedded videos, pre-training test, post-training test bank, test answer keys, and an online website with additional instruction resources.

INTRODUCTION TO GREEN BUILDING & WEATHERIZATION CURRICULUM

Topics Include: History and Cost-Benefit Analysis of Green Building; Renewable Energy Concepts and Sources (including geothermal, wind, solar, and water energy); Sustainable Planning Components (including smart growth, site planning, green design, and water management); Green/Alternative Building Materials & Installation Techniques; Waste Management and Waste Reduction; Government and Independent Regulatory and Certifying Agencies; and Energy Audit Tools, Whole-House Weatherization, and Insulation Types

GENERAL INFORMATION	
Number of Hours	40
Regulatory Requirements (State or Federal)	None
Course Prerequisites (if any)	None
Training Provider Accreditation	N/A
NIEHS Compliant	N/A
INSTRUCTOR QUALIFICATIONS	
Experience/Background of Instructor	Strong experiential and/or educational background in subject matter;
Certifications/Registration	N/A
TRAINING DELIVERY (appropriate to target audience and learning objectives)	
Student/Instructor Ratio (maximum) Lecture	25:1
Lectures/Presentations	65%
Classroom/Demonstration Activities	35%
Hands-On Activities	N/A
FACILITIES SUFFICIENCY REQUIREMENTS	
Lecture	Room must be able to accommodate all students, 1 instructor, and laptop, projector, VCR, internet connection
Hands-On	N/A

OVERALL COURSE OBJECTIVES

ENABLING OBJECTIVES		TERMINAL OBJECTIVES	
<p>The student will</p> <ol style="list-style-type: none"> 1. discover both benefits and techniques of green building; 2. have the opportunity to for free discussion on the cost-benefits analysis of green building; 3. discover sources of renewable energy; 4. discover the impact on the environment of traditional construction; 5. discover the benefits of using green building materials; 6. discover the different waste reduction methods; 7. discover the organizations which regulate and certify green buildings; and 8. discover the benefits of weatherization. 		<p>The student must</p> <ol style="list-style-type: none"> 1. identify techniques/strategies for green building; 2. identify the benefits of green building; 3. identify sources of renewable energy; 4. identify the environmental impacts of traditional construction; 5. identify green building materials and list the benefits of using those materials; 6. identify the different waste reduction methods; 7. identify organizations which regulate and certify green building; and 8. identify the benefits of green building. 	
DELIVERY METHODS			
<p>Lecture:</p> <p>Green Building</p> <p>Renewable Energy</p> <p>Sustainable Planning</p> <p>Green Materials & Techniques</p> <p>Waste Management</p> <p>Regulatory Agencies</p> <p>Weatherization</p>	<p>Classroom Activities:</p> <p>View PowerPoint® presentation, videos, participant manual, complete section review questions</p>	<p>Q/A, Group Discussions</p> <p>Group Discussions</p>	
MATERIALS			
<p>PowerPoint® Presentation, Computer, Internet connection, AV Equipment (projector/screen/VCR)</p>	<p>Black Board Chalk Tables/Chairs</p>	<p>Instructor’s Manual Participant Manual Pens/Pencils/Paper</p>	

LESSON PLAN

SECTION 1 – Green Building

LEARNING OBJECTIVES	DELIVERY METHODS	MATERIALS
<ul style="list-style-type: none"> • To discover the history of green building; • To learn the meaning of terms and concepts including: carbon footprint, greenhouse effect, renewable, and sustainable development; and • To discover the costs and benefits of green building. 	<ul style="list-style-type: none"> • Course Pre-test; • Participant Training Manual; • PowerPoint® presentation Workshop Introduction Slides 1 – 8 with embedded video; • PowerPoint® presentation Section 1 Slides 1 – 22; • Documentary film “The Greening of Southie”; • Section Review Questions 	<ul style="list-style-type: none"> • Sign-in sheets • Participant Training Manual



Lecture: Introduction (15 min)

Pass out sign-in sheet.

Explain that concerns about the environment and the ways human consumption has affected local ecologies have spawned a trend toward green building across all building trades. At the same time, the American Reinvestment and Recovery Act (ARRA) is investing \$41 billion in clean energy and energy-efficiency projects. These funds will create jobs and wealth while transforming American cities to models of green living.

Explain that this training will provide trainees with fundamental introductory awareness in green building construction and building weatherization. The objective is to set a firm foundation of terms, concepts, and general knowledge as prerequisite to hands-on and more advanced green building techniques and applications training. The training is designed to give trainees the tools to benefit from and participate in the greening of America by providing the green building awareness that is now required by employers. It is expected that this training will give trainees the opportunity to find and maintain gainful employment in the construction and environmental industries.

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Explain that although green construction skills are now being incorporated into trade skills training, in the decade to come green building will be the norm and the basis for all construction skills training.

Explain that the course will be conducted by using many training techniques (lecture, PowerPoint® presentations, classroom activities and student discussions).



Activity: Course Pre-Test (30 min)

Pass out course pre-test and ask participants to complete. Explain that the pre-test is being given to determine what knowledge participants already have regarding the course material. After training a post-test will be given to determine how much participants learned during training.



Activity: View Documentary Film “The Greening of Southie” (90 min)

View the first half of the 72-minute documentary. Instruct participants to take notes as indicated in Instructor’s Manual. After viewing first half of documentary use objective and discussion questions to test cognitive skills, to generate interest, and to help motivate participants.



Activity: View Documentary Film “The Greening of Southie” (90 min)

View the second half of the 72-minute documentary. Instruct participants to take notes as indicated in Instructor’s Manual. After viewing second half of documentary use objective and discussion questions to test cognitive skills, to generate interest, and to help motivate participants.



Lecture: Workshop Introduction (30 min)

Utilize PowerPoint® Workshop Introduction slides 1 through 7 to provide course overview and course objectives.



Activity: View Workshop Introduction Video (30 min)

View video embedded in PowerPoint® Workshop Introduction slide 8.

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Lecture: Green Building (3 hrs)

Utilize PowerPoint® Section 1 slides 1 through 19 to cover the history of green building and the cost-benefit analysis.



Activity: Q&A (15 min)

Field questions from participants.



Activity: Section Review (30 min)

Use PowerPoint® Section 1 slides 20 through 22 to ask students multiple choice section review questions. Show/tell students correct answers. Use the discussion question in the instructor's manual for classroom discussion.

LESSON PLAN

SECTION 2 – Renewable Energy

LEARNING OBJECTIVES	DELIVERY METHODS	MATERIALS
<ul style="list-style-type: none"> • To discover the types and benefits of renewable energy; • To learn the meaning of terms and concepts including: geothermal energy, wind energy, solar energy, water energy, active solar, passive solar, alternative energy 	<ul style="list-style-type: none"> • Participant Training Manual; • PowerPoint® presentation Section 2 Slides 1 – 23 with embedded videos; • Section Review Questions 	<ul style="list-style-type: none"> • Sign-in sheets • Participant Training Manual



Lecture: Introduction to Renewable Energy (30 min)

Utilize PowerPoint® presentation Section 2 slides 1 through 5 to introduce the concept of renewable energy.



Activity: View Renewable Energy Video (30 min)

View video on renewable energy embedded in PowerPoint® presentation Section 2 slide 6.



Lecture: Geothermal Energy (15 min)

Utilize PowerPoint® Section 2 slide 7 to introduce the concept of geothermal energy.



Activity: View Geothermal Energy Video (30 min)

View video on geothermal energy embedded in PowerPoint® presentation Section 2 slide 8.



Lecture: Wind Energy (15 min)

Utilize PowerPoint® Section 2 slide 9 to introduce the concept of wind energy.



Activity: View Wind Energy Video (30 min)

View video on wind energy embedded in PowerPoint® presentation Section 2 slide 10.

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Lecture: Solar Energy (30 min)

Utilize PowerPoint® Section 2 slides 11 through 14 to introduce concept of solar energy.



Activity: View Solar Energy Video (30 min)

View video on solar energy embedded in PowerPoint® presentation Section 2 slide 15.



Lecture: Water Energy (30 min)

Utilize PowerPoint® Section 2 slides 16 through 19 to introduce concept of water energy.



Activity: View Water Energy Video (30 min)

View video on water energy embedded in PowerPoint® presentation Section 2 slide 20.



Activity: Q&A (15 min)

Field questions from participants.



Activity: Section Review (30 min)

Use PowerPoint® Section 2 slides 21 through 23 to ask students multiple choice section review questions. Show/tell students correct answers. Use the discussion question in the instructor's manual for classroom discussion.

LESSON PLAN

SECTION 3 – Sustainable Planning

LEARNING OBJECTIVES	DELIVERY METHODS	MATERIALS
<ul style="list-style-type: none"> To discover meaning and scope of sustainable planning; To learn the meaning of terms and concepts including: smart growth, brownfield, greenfield, greyfield, grey water, heat island, and infill 	<ul style="list-style-type: none"> Participant Training Manual; PowerPoint® presentation Section 3 Slides 1 – 26 with embedded videos; Section Review Questions 	<ul style="list-style-type: none"> Sign-in sheets Participant Training Manual



Lecture: Introduction to Sustainable Planning (30 min)

Utilize PowerPoint® presentation Section 3 slides 1 through 5 to introduce the concept of sustainable planning.



Activity: View Smart Growth Video (45 min)

View video on smart growth embedded in PowerPoint® presentation Section 3 slide 6 to introduce the concept of smart growth.



Lecture: Smart Growth (15 min)

Utilize PowerPoint® Section 3 slides 7 and 8 to explore the concept of smart growth.



Lecture: Site Planning (30 min)

Utilize PowerPoint® Section 3 slides 9 through 14 to introduce the concept of site planning.



Lecture: Green Building Design (15 min)

Utilize PowerPoint® Section 3 slides 15 and 16 to introduce the concept of green building design.

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Lecture: Water Management (30 min)

Utilize PowerPoint® Section 3 slides 17 through 20 to introduce the concept of water management.



Activity: View Water Management Video (30 min)

View video on water management embedded in PowerPoint® presentation Section 3 slide 21.



Lecture: Water Management (15 min)

Utilize PowerPoint® Section 3 slide 22 to continue the topic of water management.



Activity: View Water Management Video (30 min)

View video on water management embedded in PowerPoint® presentation Section 3 slide 23 to complete coverage of topic.



Activity: Q&A (15 min)

Field questions from participants.



Activity: Section Review (30 min)

Use PowerPoint® Section 3 slides 24 through 26 to ask students multiple choice section review questions. Show/tell students correct answers. Use the discussion question in the instructor's manual for classroom discussion.

LESSON PLAN

SECTION 4 – Green Materials & Techniques

LEARNING OBJECTIVES	DELIVERY METHODS	MATERIALS
<ul style="list-style-type: none"> To discover the importance of green building materials and techniques in the development of green building; To learn the meaning of terms and concepts including: certified wood, cool roof, green roof, daylighting, off-gassing, recycled, render, and volatile organic compounds 	<ul style="list-style-type: none"> Participant Training Manual; PowerPoint® presentation Section 4 Slides 1 – 29 with embedded videos; Section Review Questions 	<ul style="list-style-type: none"> Sign-in sheets Participant Training Manual



Lecture: Introduction to Green Materials & Techniques (30 min)

Utilize PowerPoint® presentation Section 4 slides 1 through 6 to provide an introduction to green materials and techniques.



Lecture: Wood (15 min)

Utilize PowerPoint® presentation Section 4 slides 7 and 8 to introduce wood as both a material to be conserved and a green building material.



Lecture: Recycled Materials (15 min)

Utilize PowerPoint® presentation Section 4 slide 9 to introduce the concept of recycled materials.



Activity: Recycled Materials – Fly Ash Video (30 min)

View video on fly ash embedded in PowerPoint® presentation Section 4 slide 10.

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Activity: Recycled Materials – Steel Video (30 min)

View video on steel embedded in PowerPoint® presentation Section 4 slide 11.



Lecture: Alternative Materials (15 min)

Utilize PowerPoint® presentation Section 4 slides 12 and 13 to introduce the concept of alternative materials.



Activity: Alternative Materials – Straw Bales Video (30 min)

View video on straw bales embedded in PowerPoint® presentation Section 4 slide 14.



Lecture: Alternative Materials – BioBric® (15 min)

Utilize PowerPoint® presentation Section 4 slides 15 and 16 to introduce BioBric® as an alternative building material.



Activity: Alternative Materials – Render Video (30 min)

View video on render embedded in PowerPoint® presentation Section 4 slide 17.



Lecture: Alternative Materials – Hemcrete® (15 min)

Utilize PowerPoint® presentation Section 4 slide 18 to introduce Hemcrete® as an alternative building material.



Activity: Alternative Materials Video (45 min)

View video on alternative materials embedded in PowerPoint® presentation Section 4 slide 19 to complete the topic.



Activity: Green Techniques Video (45 min)

View video on green techniques embedded in PowerPoint® presentation Section 4 slide 20 to introduce the topic.

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Lecture: Green Techniques (15 min)

Utilize PowerPoint® presentation Section 4 slides 21 and 22 to define green techniques of cool roofs and green roofs.



Activity: GreenScapes® Video (30 min)

View video on GreenScapes® embedded in PowerPoint® presentation Section 4 slide 23.



Lecture: Indoor Air Quality (45 min)

Utilize PowerPoint® presentation Section 4 slides 24 through 26 to introduce the concepts of indoor air quality, off-gassing, toxic reduction, and green chemistry.



Activity: Q&A (15 min)

Field questions from participants.



Activity: Section Review (30 min)

Use PowerPoint® Section 4 slides 27 through 29 to ask students multiple choice section review questions. Show/tell students correct answers. Use the discussion question in the instructor's manual for classroom discussion.

LESSON PLAN

SECTION 5 – Waste Management

LEARNING OBJECTIVES	DELIVERY METHODS	MATERIALS
<ul style="list-style-type: none"> To discover the importance of waste management and waste reduction in the development of green building; To learn the meaning of terms and concepts including: waste management, commingled recycling, source separation recycling, deconstruction, composting, and bioreactor 	<ul style="list-style-type: none"> Participant Training Manual; PowerPoint® presentation Section 5 Slides 1 – 15 with embedded videos; Section Review Questions 	<ul style="list-style-type: none"> Sign-in sheets Participant Training Manual



Lecture: Introduction to Waste Management (30 min)

Utilize PowerPoint® presentation Section 5 slides 1 through 5 to provide an introduction to waste management.



Lecture: Waste Reduction (30 min)

Utilize PowerPoint® presentation Section 5 slides 6 through 9 to introduce the concepts of waste reduction and recycling.



Activity: Recycling (45 min)

View video on recycling embedded in PowerPoint® presentation Section 5 slide 10 to cover commingled and source separation recycling.

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Activity: Recycling (30 min)

View video on recycling embedded in PowerPoint® presentation Section 5 slide 11 to cover deconstruction and composting.



Lecture: Bioreactors (15 min)

Utilize PowerPoint® presentation Section 4 slide 12 to introduce the concept of bioreactors.



Activity: Q&A (15 min)

Field questions from participants.



Activity: Section Review (30 min)

Use PowerPoint® Section 5 slides 13 through 15 to ask students multiple choice section review questions. Show/tell students correct answers. Use the discussion question in the instructor's manual for classroom discussion.

LESSON PLAN

SECTION 6 – Regulatory Agencies

LEARNING OBJECTIVES	DELIVERY METHODS	MATERIALS
<ul style="list-style-type: none"> • To discover the government and private organizations which regulate and/or certify green building; • To learn the meaning of terms and concepts including: LEED certification, and greenwashing; • To learn the roles of the U.S. E.P.A. and U.S. D.O.E. in regulation and monitoring of environmental areas of concern; • To learn which independent agencies regulate and certify green building. 	<ul style="list-style-type: none"> • Participant Training Manual; • PowerPoint® presentation Section 6 Slides 1 – 14 with embedded videos; • Section Review Questions 	<ul style="list-style-type: none"> • Sign-in sheets • Participant Training Manual



Lecture: Introduction to Regulatory Agencies (30 min)

Utilize PowerPoint® presentation Section 6 slides 1 through 5 to provide an introduction to regulatory agencies.



Lecture: Regulatory Agencies (15 min)

Utilize PowerPoint® presentation Section 6 slide 6 to introduce cover the roles of the U.S. Environmental Protection Agency and the U.S. Department of Energy.



Activity: EnergyStar® Video (30 min)

View video on EnergyStar® program embedded in PowerPoint® presentation Section 6 slide 7.

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Lecture: Independent Regulatory Agencies (30 min)

Utilize PowerPoint® presentation Section 6 slide 8 to introduce the various independent regulatory agencies and their areas of concentration.



Activity: USGBC and LEED Certification (30 min)

View video on the U.S. Green Building Council program embedded in PowerPoint® presentation Section 6 slide 9.



Lecture: Independent Certifying Agencies (30 min)

Utilize PowerPoint® presentation Section 6 slide 10 to introduce the various independent certifying organizations and their areas of concentration.



Activity: LEED Certification (30 min)

View video on the U.S. Green Building Council LEED Certification program embedded in PowerPoint® presentation Section 6 slide 11.



Activity: Q&A (15 min)

Field questions from participants.



Activity: Section Review (30 min)

Use PowerPoint® Section 6 slides 12 through 14 to ask students multiple choice section review questions. Show/tell students correct answers. Use the discussion question in the instructor's manual for classroom discussion.

LESSON PLAN

SECTION 7 – Weatherization

LEARNING OBJECTIVES	DELIVERY METHODS	MATERIALS
<ul style="list-style-type: none"> • To discover the factors involved in weatherization; • To learn the importance of energy audits in the weatherization process; • To learn the meaning of terms and concepts including: blower door, R-value, thermal envelope, and unconditioned space; • To learn the types of materials used in insulation. 	<ul style="list-style-type: none"> • Participant Training Manual; • PowerPoint® presentation Section 7 Slides 1 – 29 with embedded videos; • Section Review Questions 	<ul style="list-style-type: none"> • Sign-in sheets • Participant Training Manual



Lecture: Introduction to Weatherization (30 min)

Utilize PowerPoint® presentation Section 7 slides 1 through 6 to provide an introduction to weatherization.



Lecture: Energy Audit Tools (15 min)

Utilize PowerPoint® presentation Section 6 slides 7 and 8 what energy audits are and how they are used in the weatherization process.



Lecture: Whole-House Weatherization (15 min)

Utilize PowerPoint® presentation Section 7 slide 9 to introduce the concept of whole-house weatherization.

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Activity: Blower Door Video (30 min)

View video on blower doors embedded in PowerPoint® presentation Section 7 slide 10.



Lecture: Whole-House Weatherization (45 min)

Utilize PowerPoint® presentation Section 7 slides 11 through 14 to introduce the concepts of sealing and thermal envelope and to cover heating and cooling systems.



Lecture: Types of Insulation (105 min)

Utilize PowerPoint® presentation Section 7 slides 15 through 26 to introduce the different types of insulation such as blanket, concrete block, foam board, loose-fill, vermiculite/perlite, reflective, rigid fiber board, and liquid foam insulation.



Activity: Q&A (15 min)

Field questions from participants.



Activity: Section Review (30 min)

Use PowerPoint® Section 7 slides 27 through 29 to ask students multiple choice section review questions. Show/tell students correct answers. Use the discussion question in the instructor's manual for classroom discussion.



Lecture: Additional Resources (15 min)

Utilize resources page in instructor's manual to provide participants with other sources of information on green building.



Lecture: Workshop Summary Q & A and (60 min)

Summarize the main points of the training including: the definition of green building; the importance of site planning and smart growth in the green building process; green building applications during building construction, operation and maintenance; the importance of green building in resource and energy conservation; and the link between weatherization and energy efficiency.

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Activity: Post-Training Test (1 hr)

Administer one of the post-training tests from the instructor manual test bank. Grade papers and compare scores to pre-test taken at the beginning of training.



Activity: Post-Training Evaluations (30 min)

Have participants to complete training evaluation and instructor evaluation forms.