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SYLLABUS: ART & DESIGN WITH PARSONS CERTIFICATE PROGRAM

## **Healthier Materials and Sustainable Building**

PCID 0605 X1

**Materials and Human Health** - PCID 0601 X1

**Building Products and Chemistry** - PCID 0602 X1

**Healthier Material Design & Specification** - PCID 0603 X1

**Executing a Healthier Project** - PCID 0604 X1



### **Course Meeting:**

Online

### **Faculty:**

cmurphy@newschool.edu

### **Program Description:**

Developed by education experts at Parsons' Healthy Materials Lab, this online certificate program has been created to provide designers, architects, developers, contractors, management companies and facilities personnel with material health information, consolidated in one educational offering that will build their capacity to positively transform their practices with human health at the forefront of their decisions. It is composed of four self-paced online courses, which lead to a certificate in *Healthier Materials and Sustainable Building*. The first and second courses provide an introduction to key topics in the field of materials and health for those with general or more specialized interests. The third and fourth courses are geared towards professionals in the built environment, and those concerned with making a positive impact in product specification, installation, and

maintenance. The goal of the program is to empower practitioners to make change with the knowledge that healthier buildings lead to healthier lives. The program is intended to both complement existing Parsons degree programs and serve as continuing education for professionals.

### **Learning Outcomes:**

1. Understand why material health is important and its relationship to the human body.
2. Understand the impact of the life-cycle of materials
3. Knowledge and ability to evaluate materials based on specific health issues
4. Understand pathways for exposure during the use phase in interiors
5. Analyze the various tools, certifications, standards etc. for evaluating materials
6. Develop a methodology for material analysis
7. Develop a system that could be adopted by other professionals to evaluate and specify materials.

### **Course Requirements:**

This program and the courses within, are self-paced and can be completed at any time that works with your schedule. All course work must be completed by the end of the semester.

### **Course Completion and CEU Credits:**

Certification of Completion, 18 AIA CEU (HSW) Credits

### **Course Outline:**

Course I

#### **MATERIALS AND HUMAN HEALTH**

This course explores the impact that building materials can have on human health, demonstrating the systemic intricacies that will challenge students to keep asking questions while offering suggestions for addressing these issues in their work.

Must be taken as the first course in a four-course series. CEU for Continuing Education Credits: 4 AIA CEU HSW

#### **Week 1: Materials and Health**

1. The Significance of Materials and Health
  - a. Introduction: Why Do We Care? - **Alison Mears**, HML at Parsons
  - b. Let's Consider Lead (Pb) - **Alison Mears**, HML at Parsons
  - c. What We Make Affects People's Health - **Ken Geiser**, UMass, Lowell
  - d. Making Change - **Alison Mears**, HML at Parsons
2. Environmental Health and Vulnerable Populations
  - a. How do Chemicals Get Into Our Bodies? - **Dr. Maida Galvez**, Mount Sinai
  - b. What Happens When Chemicals Get Into Our Bodies? - **Dr. Maida Galvez**, Mount Sinai
  - c. Putting Risk Into Context - **Dr. Maida Galvez**, Mount Sinai
  - d. How Does the Life Cycle of Building Materials Impact People and the Environment? - **Darcy Bender**, SF Shines

- e. Vulnerable Populations and Systematic Injustice - **Ogonnaya Dotson-Newman**, The JPB Foundation
  - f. Working *with* Communities - **Ogonnaya Dotson-Newman**, The JPB Foundation
3. Life Cycle of Materials
- a. The Backstory of Materials and Health - **Mikhail Davis**, Interface
  - b. Transportation and Packaging of Materials - **Darcy Bender**, SF Shines
  - c. Products in the Use Phase - **Mikhail Davis**, Interface
  - d. End of Use Options - **Sean Ragiel**, CarpetCycle
  - e. Make Better Products - **Amanda Kaminsky**, Building Product Ecosystems
  - f. Designing for Safe Recycled Content - **Sean Ragiel**, CarpetCycle

## **Week 2: Material Systems, Evaluations & Design**

- 1. Toxicity and Exposure in Indoor Environments
  - a. Product Composition and Exposure - **Ken Geiser**, UMass Lowell
  - b. Toxicity Indoors - **Jeffrey Siegel**, University of Toronto
  - c. Mitigating Indoor Air Pollutants - **Jeffrey Siegel**, University of Toronto
  - d. Evaluating What's in Indoor Air - **Catherine Bobenhausen**, Colden Corporation
- 2. How to Avoid Hazards
  - a. Setting Goals for Hazard Avoidance - **Bill Walsh**, HBN
  - b. Reporting and Disclosure of Product Content - **Wendy Vittori**, HPDC
  - c. Certifications and Rating Systems - **Russ Perry**, Smithgroup JJR
  - d. Making Sense of the Tools - **Wendy Vittori**, HPDC
  - e. C2C: Looking Forward - **Lewis Perkins**, C2C
- 3. Pathways to Healthier Environments
  - a. Considerations in Practice - **Amanda Kaminsky**, Building Product Ecosystems
  - b. Avoiding Hazards - **Bill Walsh**, HBN
  - c. Taking Action - **Jonsara Ruth**, HML at Parsons
  - d. Guidance From the Experts - Multiple Experts
  - e. Making Change - **Jonsara Ruth**, HML at Parsons

## Course II

### **BUILDING PRODUCTS AND CHEMISTRY**

This course introduces students to the fundamentals of chemistry, enabling them to understand why particular outcomes and health impacts are produced. It introduces students to chemicals of concern and more healthful alternatives that are being formulated by green chemists. It asks how project health goals can be outlined and informed decisions made on the basis of these findings. Must be taken as the second course in a four-course series. CEU for Continuing Education Credits Credits: 4 AIA HSW

## Week 1: Product Chemistry

1. The Significance of Chemistry
  - a. How is Chemistry Relevant to Healthier Building Materials? - **Bhawani Venkataraman**, The New School
  - b. How does Chemistry Shape the World we Live in? - **Bhawani Venkataraman**, The New School
  - c. How does Chemistry Influence Human Health? - **Bhawani Venkataraman**, The New School
  - d. Biomimicry: Chemistry in design **Bhawani Venkataraman**, The New School
  - e. Chemical Risks to the Global Community **Bhawani Venkataraman**, The New School
2. Chemical Hazards and Toxicology
  - a. Introduction to Toxicology - **Laura Vandenberg**, UMass, Amherst
  - b. Chemical Assessment - **Laura Vandenberg**, UMass, Amherst
  - c. Hazard, Exposure, Dose-Response, and Risk - **Laura Vandenberg**, UMass, Amherst
  - d. Toxicology and Vulnerable Populations - **Laura Vandenberg**, UMass, Amherst
  - e. Old Versus New Toxicology - **Laura Vandenberg**, UMass, Amherst
3. Green Chemistry
  - a. Introduction: Green chemistry - **John Warner**, WBI
  - b. What is Green chemistry? - **John Warner**, WBI
  - c. How does Green Chemistry Fit into the *Big Picture*? - **John Warner**, WBI
  - d. Some Example of Green Chemistry at WBI - **John Warner**, WBI

## Week 2: Material Systems, Evaluations & Design

1. Classifying Chemicals
  - a. Introduction to Chemical Classification - **Laura Vandenberg**, UMass, Amherst
  - b. Classes Related to Materials and Health - **Laura Vandenberg**, UMass, Amherst
  - c. Case Studies Relevant to Hazards and Building Materials: Lessons Learned? - **Laura Vandenberg**, UMass, Amherst
2. Chemicals of Concern: Six Classes, Asbestos + Formaldehyde
  - a. Introduction to Hazard Identification and a Retrospective on Asbestos - **Jim Vallette**, HBN
  - b. Introduction to Six Classes - **Arlene Blum**, GSPI
  - c. Highly Fluorinated Chemicals - **GSPI & HML**
  - d. Antimicrobials - **GSPI & HML**
  - e. Flame Retardants - **GSPI & HML**
  - f. Bisphenols & Phthalates - **GSPI & HML**
  - g. Organic Solvents - **GSPI & HML**
  - h. Certain Metals - **GSPI & HML**

- i. Additional Chemicals of Concern: Urea-Formaldehyde - **Tom Lent**, HBN
  - j. Additional Chemicals of Concern - Nanochemicals - **David Andrews**, EWG
- 3. Chemical Policy and Prevalence in the Building Industry
  - a. Current state of regulation - **David Andrews**, EWG
  - b. Barriers to Change: Case Study of Flame Retardants - **Avery Lindeman**, GSPI
  - c. Advocacy and Communication Strategies - **David Andrews**, EWG
  - d. Tools for Screening and Evaluation - **Bill Walsh**, HBN
- 4. Strategies and Guiding Principles for Designers
  - a. Education Phase - **Susan Kaplan**, HLW
  - b. Goal Phase - **Susan Kaplan**, HLW
  - c. Pre-Search Phase - **Susan Kaplan**, HLW
  - d. Search Phase - **Susan Kaplan**, HLW
- 5. Designer's Dilemma - **Amanda Kaminsky**, Building Product Ecosystems

### Course III

#### **HEALTHIER MATERIALS DESIGN AND SPECIFICATION**

This course helps designers navigate industry resources and certifications, find and evaluate product options, and apply resources for maximum impact. We look at methods for targeting specific issues in a project and generalized strategies that can apply more universally, highlighting potential benefits and consequences of employing different approaches. CEU for Continuing Education Credits: 5 AIA CEU HSW

#### **Week 1: Design Principles and Methods for Process**

- 1. Approaching Healthier Materials Design
  - a. What does Healthier Materials Design Look like? - **Jonsara Ruth**, HML at Parsons
  - b. Fundamental Goals and Principles of the Process- **Mikhail Davis**, Interface
  - c. Materials Considerations and Priorities - **Martha Lewis**, Henning Larsen
  - d. Current Challenges and Opportunities in the Industry - **Mike Manzi**, Bora Architects
- 2. Design Properties and Principles
  - a. First Principles - **Suzanne Drake**, Perkins + Will, and **John Amatruda**, Vidaris
  - b. Material Properties - **Suzanne Drake**, Perkins + Will, and **John Amatruda**, Vidaris
  - c. Design Qualities - **Suzanne Drake**, Perkins + Will
  - d. Operational Considerations - **Suzanne Drake**, Perkins + Will
  - e. Past and Future Inspiration - **Suzanne Lee**, Modern Meadow
- 3. Pre-Search: Identifying Criteria and Metrics
  - a. Transparency and Disclosure Criteria - **Paul Mellblom**, MSR Design
  - b. Performance, Quality, and Costs - **Gina Cignik**, HBN

- c. Social Justice and Accessibility - **Anasa Scott**, Colin Powell School

## **Week 2: Finding and Evaluating Products**

1. Compiling Options and Information
  - a. Where to Start? - **Jeff Frost**, Brightworks Sustainability
  - b. Screening Your Options - **James Connelly**, ILFI
  - c. Review and Outreach to Manufacturers - **Suzanne Drake**, Perkins + Will
  - d. Transforming the Market: The Role of Retailers - **Jim Vallette**, HBN & **Jack Dinning**, HML
2. Product Assessment and Characterization
  - a. Approaches to Reviewing Product Health: Levels of Confidence - **Frances Yang**, Arup
  - b. Translating Reports into Decision Making - **Jim Vallette**, HBN & **Jack Dinning**, HML
  - c. Understanding and Researching Chemicals of Concern - **Martha Lewis**, Henning Larsen
  - d. Hidden Hazards: What might not be on the Label - **Mike Manzi**, Bora Architects
  - e. Considering Performance and Exposure Likelihood - **Suzanne Drake**, Perkins + Will, and **John Amatruda**, Vidaris
3. Comparing Options and Making Decisions
  - a. Tools for Calculating Impacts - **Rhys MacPherson**, MSR Design
  - b. Prioritizing Criteria that are more Influential - **Rhys MacPherson**, MSR Design
  - c. Addressing Conflicts and Optimizing Design - **Rhys MacPherson**, MSR Design
  - d. Communicating Decisions and Articulating Product Criteria - **Rhys MacPherson**, MSR Design
4. Designer's Dilemma: No Perfect Products - **Chris Hellstern**, Miller Hull

### Course IV

#### **EXECUTING A HEALTHIER PROJECT**

This course deals with the full process of creating healthier buildings, covering challenges encountered throughout design, construction, maintenance, and operation. The course is framed as a collection of lessons learned through professional experience to help professionals become better informed so that they can make decisions with an overall awareness of the protocols for healthier design. CEU for Continuing Education Credits: 5  
AIA CEU HSW

#### **Week 1: Planning for Project Implementation**

1. Approaching Healthier Materials at the Project Scale
  - a. Scaling Material-Health Considerations to Larger Construction Projects - **Amanda Kaminsky**, Building Product Ecosystems

- b. Standards and Frameworks for Healthier Design - **Chris Hellstern**, Miller Hull
  - c. Major Obstacles in Practice Today - **Aaron Dorf & Dennis Rijkhoff**, Snøhetta
  - d. A Case Study of Affordable Housing and Financing - **Bea de la Torre**, NYC HPD
  - e. Key Principles from Across the Field - **Breeze Glazer**, Lightstep
2. Rallying Your Team and Building a Culture
    - a. Incorporating Health into Your Decision Making Factors - **Martha Lewis**, Henning Larsen & **David Lewis**, LTL Architects
    - b. Why Material Health Cannot be an Afterthought - **Martha Lewis**, Henning Larsen & **David Lewis**, LTL Architects
    - c. Integrated Project Planning: Involving Critical Stakeholders - **Martha Lewis**, Henning Larsen & **David Lewis**, LTL Architects
    - d. Communication Strategies for Engaging the Team - **Martha Lewis**, Henning Larsen & **David Lewis**, LTL Architects
    - e. Reconciling Material Health and Energy Efficiency - **James Connelly**, ILFI
  3. Defining the Project Framework and Methods
    - a. Identifying Health Goals and Opportunities for Impact - **Marty Keller**, First Community Housing
    - b. Translating Goals into Specific Objectives & Metrics and Methods for Characterizing Health Impacts - **John Amatruda**, Vidaris
    - c. Commonalities Among Major Building Standards - **Jack Dinning**, HML
    - d. Dissecting the LBC: Strengths and Limitations - **Amanda Sturgeon**, ILFI
    - e. Codes, Regulations, and Incentive Programs - **Breeze Glazer**, Lightstep
    - f. Customizing Your Own Framework - **Aaron Dorf & Dennis Rijkhoff**, Snøhetta
  4. Adjusting Scope, Schedule, and Responsibilities
    - a. An Owner's Representative Focus on Healthier Materials - **Heather Henriksen**, Office of Sustainability, Harvard
    - b. How to Strategize for Capital Projects - **Heather Henriksen**, Office of Sustainability, Harvard
    - c. Success Without Impacting Scope and Schedule - **Heather Henriksen**, Office of Sustainability, Harvard
    - d. Transforming the Marketplace for Health - **Heather Henriksen**, Office of Sustainability, Harvard

## **Week 2: The Roles of the Team**

1. Design Team
  - a. Design Principles - **Martha Lewis**, Henning Larsen
  - b. Material Categories: Where to Keep an Eye Peeled - **Martha Lewis**, Henning Larsen

- c. Streamlining Workflows - **Martha Lewis**, Henning Larsen & **David Lewis**, LTL Architects
  - d. Engineering Controls: Expect the Best, Prepare for the Works - **Shanta Tucker**, Atelier Ten
  - e. Monitoring Construction Administration - **John Woelfling** & **Steve Frankel**, Dattner Architects
  - f. Writing and Implementing Specifications - **Melissa Balestri**, ZGF Architects
  - g. Managing Risk and Liability - **John Woelfling** & **Steve Frankel**, Dattner Architects
2. Construction Team
- a. The Significance of Material Health to Contractors - **Emily Naud** & **Hank Burr**, GCI Contractors
  - b. Defining Practices and Coordinating Subcontractors - **Geoff Brock**, Structure Tone
  - c. Materials Procurement and Handling - **Geoff Brock**, Structure Tone
  - d. Protective Measures Through Installation - **Geoff Brock**, Structure Tone
  - e. Commissioning and Preparing for Occupancy - **Geoff Brock**, Structure Tone
  - f. Preparing for Renovation or Demolition - **Alexandra Arce Gomez**, Madrone Construction Resources
3. Occupants, Maintenance, and Operations Team
- a. Project Turnover and the Role of Occupants - **Monica Nañez**, First Community Housing
  - b. Furnishings and Supplies - **Judy Levin**, Center for Environmental Health
  - c. Operations and Cleaning Protocols - **Jason Marshall**, TURI
  - d. Post Occupancy Monitoring and Engagement - **Monica Nañez**, First Community Housing
4. Visioning For Healthier Built Environments
- a. A New Generation: Why This Work is Important - **Parsons Graduates**
  - b. A New Generation: Moving Forward Understanding the Complexities - **Parsons Graduates**
  - c. Healthy and Thriving Communities: The Harvard Approach - **Heather Henriksen**, Office of Sustainability, Harvard
  - d. Thinking Ahead, Creating the Vision - **Heather Henriksen**, Office of Sustainability, Harvard, **Alison Mears** & **Jonsara Ruth**, HML
  - e. Standing on the Shoulders of Others - **Heather Henriksen**, Office of Sustainability, Harvard, **Alison Mears** & **Jonsara Ruth**, HML
  - f. The Vision in Professional Practice - **Alison Mears** & **Jonsara Ruth**, HML
  - g. How Incentives Drive Change - **Alison Mears** & **Jonsara Ruth**, HML