MSBPD
Master of Science in Building Performance & Diagnostics

SoA — Carnegie Mellon University

1 Fall 1st Year (40 units min)

Pre-Requisite
48-635 | ES 1: Climate, Energy in Bldgs (9)

Research
48-620 | Situating Research (3)

Perf of Bldgs & Urban Systems
48-729| Sustainability, Productivity, Health & Quality of the Built Environment (9~12)
48-798 | HVAC & Power Supply for Low-Carbon Buildings (9~12)

Performance Evaluation Tools
15-110/112 | Principles of Computing (10) **and/or**
12-746/780 equivalent Python + R

S/Electives
Refer to List Below

2 Spring 1st Year (45 units min)

Research
48-711 | Paradigms of Research (9)

Perf of Bldgs & Urban Systems
48-692 | Shaping Light (9)
90-789 | Resilient & Sustainable Comm (9)

Performance Evaluation Tools
48-569/781 GIS/CAFM (9~12)
48-721 | Bldg Performance Modeling (9~12)

S/Electives
Refer to List Below

3 Fall 2nd Year (45 units min)

Research
48-768 | Thesis Prep (18)

Perf of Bldgs & Urban Systems
48-768 | IEQ & Post Occupancy Eval (9) or equivalent

Performance, Data & Statistics
15-121 | Intro to Data Structures (10) or
12-740 Data Acquisition + Data Management (Fall 6+ Spring 6)
36-749 Experimental Design for Behavioral & Social Sciences (9) or
90-711 Statistical Reasoning with R (9)

4 Spring 2nd Year (36+ units)

Research
48-769 | Thesis (18)

Perf of Bldgs & Urban Systems
48-721 Bldg Controls and Diagnostics (12)

Sustainability Theory & Policy
48-795| LEED, Green Design and Bldg Ratings in a Global Context (6) or equivalent

S/Electives
Refer to List Below

Program Description

The Master of Science in Building Performance & Diagnostics (MSBPD) is a two-year program for architecture and engineering graduates committed to advancing the quality of the built environment for human health and ecological sustainability. MSBPD graduates have successful careers in design and engineering practice, in industry, government, consulting, and non-profit sectors – designing, catalyzing and quantifying high performance buildings and communities.

The MSBPD curriculum is intended to provide four semesters of intensive learning about: sustainability science; sustainable technologies and systems; performance simulation tools; data acquisition and analytics; social science and statistics; sustainability economics and policy.

Courses are offered by faculty across the disciplines at CMU. The MS curriculum also serves as the required minimum coursework for PhD studies at CMU, upon successful admission to the program with a PhD advisor.

Program Requirements

In addition to the course requirements for the MSBPD program, students must satisfy:
• A minimum of 160 units of course work with a minimum residency of three (3) academic semesters at full-time status (36 units).
• A GPA of 3.0, with exceptions to be approved by the graduate faculty.
• Advanced standing & core course substitution that have been pre-approved by the Track Chair.
• Advanced standing of one or two semesters of coursework for qualified CMU students within the B.Arch and M.Arch program through the Accelerated Master's Program (AMP).

Approved Selectives/Electives

Perf of Bldgs & Urban Systems
Zero Energy Housing
Protean Systems
Sustainable Engineering Principles

Performance Evaluation Tools
Environmental Performance Simulation
Designing for the Internet of Things
Advanced CAD, BIM, and 3D Visualization
Environmental Life Cycle Assessment

Performance, Data & ML
Inquiry into Machine Learning and Design
Database Design and Management
Machine Learning in Practice
Applied Data Analysis
Data Analytics for Design
Exploring and Visualizing Data

Statistics for Social & Data Science
Survey Design
Analysis of Survey Data
Sampling, Survey and Society
Probability and Statistics
Statistical Methods for Managers

Sustainability Theory & Policy
Introduction to Ecological Design Thinking
Planning by Design: Campuses to Cities
Sustainable Energy - The Developing World
Energy Policy & Economics
Cities, Technology & the Environment
Ecology and Theory
Systems Thinking for Environmental Policy and Planning
Shaping the Built Env: Experiments in Geometry Matter