



Urban Heat Mitigation and Cool Cities

Course: Heat Mapping, Cool Materials and Heat-Health Plans



Urban Heat Mitigation and Cool Cities Course: Heat Mapping, Cool Materials and Heat-Health Plans

Introduction:

Urban heat mitigation and cool cities, through heat mapping, cool materials and heat-health plans, is the subject of this 5-day course for municipal planners, master-developer planning teams, public-realm designers and public-health heat units, who produce an Urban Heat Mitigation and Heat-Health Action Plan for a case district. Hot-arid cities keep adding dark roofs, asphalt and unshaded walking routes, and heat warnings rarely reach the residents and workers most exposed. Nominees already shape district layouts, streetscapes or heat warnings and work through case studies on thermal data. CoreConcept Training Center delivers this urban heat mitigation course.

Course Objectives:

- Distinguish surface and air-temperature urban heat islands and explain their drivers in hot-arid districts, including albedo, impervious cover, waste heat and street canyon geometry
- Build a district heat map by combining satellite land surface temperature, fixed sensors and mobile air temperature traverses, and identify heat hotspots and exposed populations
- Specify cool roofs, cool and permeable pavements, tree canopy, shade structures and green roofs using solar reflectance, thermal emissivity and evapotranspiration performance criteria
- Assess urban form, ventilation corridors and links to district cooling and waste-heat sources when choosing mitigation measures for a new or existing district
- Design a heat-health early warning chain with trigger thresholds, public and medical advice, cooling refuges and care-system preparedness
- Prepare an Urban Heat Mitigation and Heat-Health Action Plan with prioritised hotspots, measures, owners and outdoor thermal comfort indicators

Target Audience:

- Municipal planning units responsible for district plans, streetscape standards and public-realm capital programmes
 - Master-developer and large-project planning teams responsible for new districts, mixed-use communities and their outdoor environment
 - Landscape and public-realm design leads responsible for tree planting, shade, paving and open-space specifications
 - Public-health and emergency preparedness units responsible for heat warnings, vulnerable-population outreach and care-system readiness
 - Urban environment and sustainability units responsible for monitoring city temperature, canopy cover and cooling programmes
-

Course Outline:

Day 1: Urban Heat Islands in Hot-Arid Cities and Baseline Review

- Surface Versus Canopy-Layer Heat Island Definitions and Drivers
- Albedo, Impervious Cover and Anthropogenic Waste Heat Sources
- Urban Canyon Geometry and Night-Time Heat Retention Effects
- Heat Exposure and Vulnerability Profile of Residents and Outdoor Workers
- District Heat Baseline Checklist for an Existing Neighbourhood

Day 2: Heat Mapping Methods, Indices and Thermal Comfort Measures

- Satellite Land Surface Temperature Maps for Hotspot Screening
- Fixed Sensor Networks and Mobile Air Temperature Traverse Campaigns
- UHI Index Degree-Hours Comparison Against Rural Reference Points
- Local Climate Zone Classification and Sky View Factor Mapping
- Outdoor Thermal Comfort Indices and Microclimate Simulation Models

Day 3: Cooling Measures: Canopy, Shade and Cool Materials

- Street Tree Canopy Targets, Species Selection and Irrigation Planning
- Shade Structure Networks for Walking Routes and Transit Stops
- Cool Roof Specification Using Solar Reflectance and Thermal Emissivity
- Cool and Permeable Pavement Selection With Glare Trade-Offs
- Green Roofs, Water Features and Evaporative Cooling in Plazas

Day 4: Urban Form, District Cooling Links and Heat-Health Early Warning

- Ventilation Corridors, Building Orientation and Street Aspect Ratios
- District Cooling and Waste Heat Rejection Siting Considerations
- Heat-Health Action Plan Core Elements and Agency Roles
- Heat Warning Trigger Thresholds and Public Advice Cascades
- Cooling Refuges, Care-System Surge Preparedness and Outreach Lists

Day 5: Case Study: Urban Heat Mitigation and Heat-Health Action Plan

- Case District Thermal Map and Hotspot Ranking Exercise
 - Mitigation Measure Package Selection for Ranked Hotspots
 - Heat Warning Chain Design for the Case Municipality
 - Outdoor Thermal Comfort Indicators and Monitoring Schedule
 - Urban Heat Mitigation and Heat-Health Action Plan Completion
-

Skills You Will Gain:

- Heat Island Diagnosis
- Thermal Hotspot Mapping
- Cool Material Specification
- Urban Canopy Planning
- Shade Network Design
- Microclimate Assessment
- Heat Warning Design
- Vulnerable Population Targeting

Why Attend This Course:

- Deliver an Urban Heat Mitigation and Heat-Health Action Plan for a case district to the planning director, the project board or the public-health heat lead
- Decide which hotspots receive canopy, shade or cool surfaces first, using thermal maps and exposure evidence rather than visual judgement
- Avoid paving, roofing and planting choices that trap heat, raise cooling loads or produce glare that later has to be reworked
- Share the heat baseline checklist, hotspot ranking sheet and warning trigger template with planning and health colleagues

Conclusion:

Back at work, the participant hands the Urban Heat Mitigation and Heat-Health Action Plan to the planning director, the project board or the public-health heat lead, who use its hotspot ranking and measure package to direct streetscape budgets, design briefs and warning procedures before the next hot season. Design and maintenance units apply its material and canopy specifications to new contracts, while health units test its warning chain. After the first hot season under the plan, the unit should compare measured hotspot temperatures, canopy and shade coverage and heat-related service calls against the baseline.

Frequently Asked Questions FAQ:

What should participants know before the urban heat mitigation and cool cities course?

Participants should already work on district plans, streetscapes, landscape design or heat warnings and be able to read maps and simple data tables. Remote sensing or modelling expertise is not required. A map or plan of a district they know helps them apply the case work.

How does urban heat mitigation and cool cities differ from a climate risk course or a green building course?

Urban heat mitigation works at street and district scale on outdoor temperatures, shade and heat warnings. Climate risk courses build organisational risk registers for many hazards, while green building courses design individual buildings and plan rating credits.

Why do cool materials and tree canopy matter for urban heat mitigation in hot-arid cities?

Cool materials and tree canopy reduce the heat that surfaces absorb and release at night. Reflective roofs and pavements lower surface temperatures, while trees add shade and evapotranspiration, so walking routes and homes stay cooler during heat waves.

What do participants take back from the urban heat mitigation and cool cities course?

Participants take back an Urban Heat Mitigation and Heat-Health Action Plan for a case district, with a heat baseline checklist, hotspot ranking sheet, cool material specification notes and a heat warning trigger template they can adapt to their own city.
