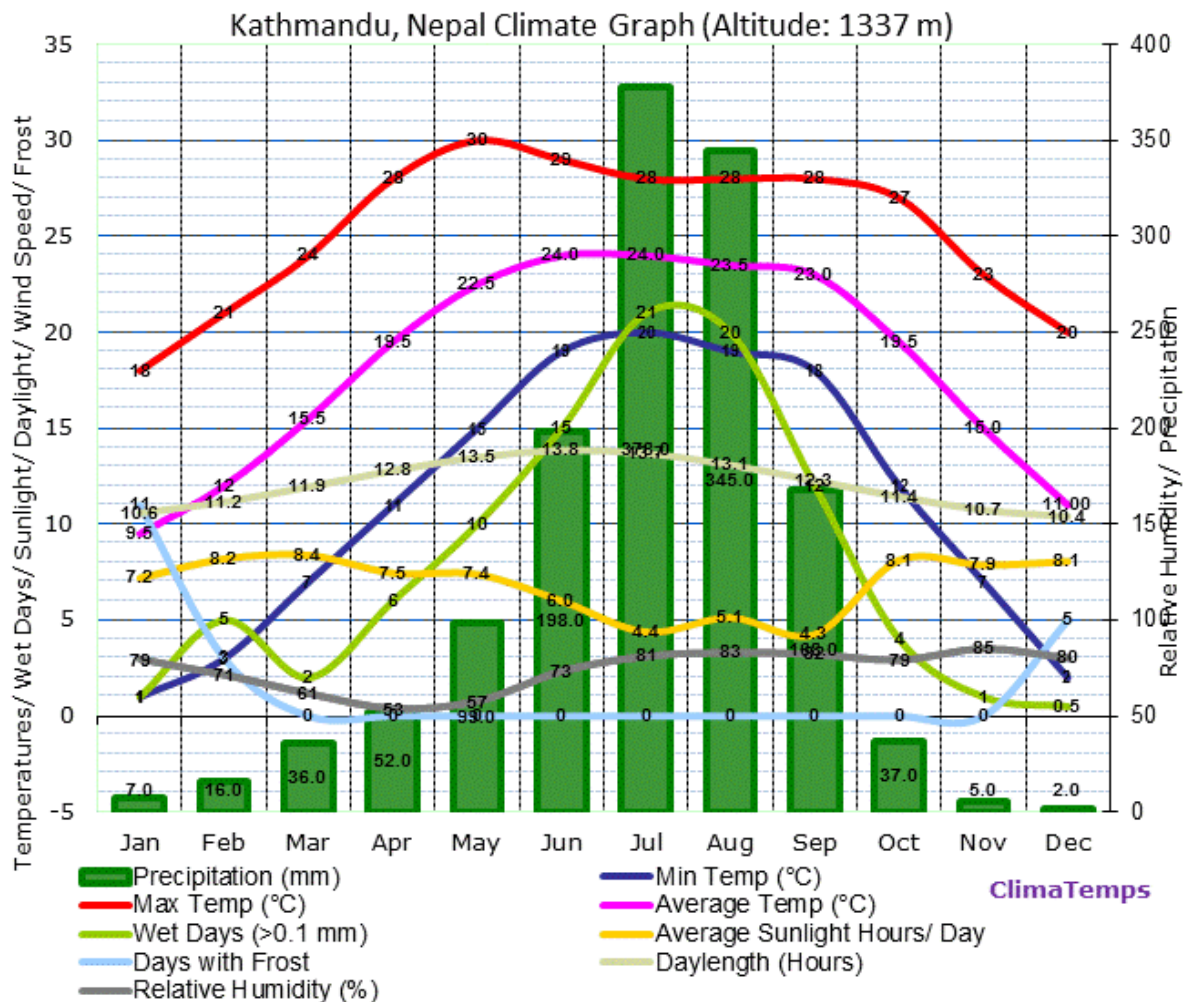


# Lalitpur Training Centre

## Climate data

- Kathmandu, Nepal is at 27°42'N, 85°22'E, 1337 m (4386 ft).
- Kathmandu has a humid subtropical hot summer climate that is mild with dry winters, hot humid summers and moderate seasonality.
- According to the Holdridge life zones system of bioclimatic classification Kathmandu is situated in or near the subtropical wet forest biome.



### ***Main characteristics***

High humidity with a definite wet and dry season.

Warm to hot summers with mild winters.

Distinct summer/winter seasons.

Moderate to low diurnal (day–night) temperature range, typically greater during winter.

### ***Key design objectives***

Reduce heating demand and substantially reduce cooling with appropriate passive design.

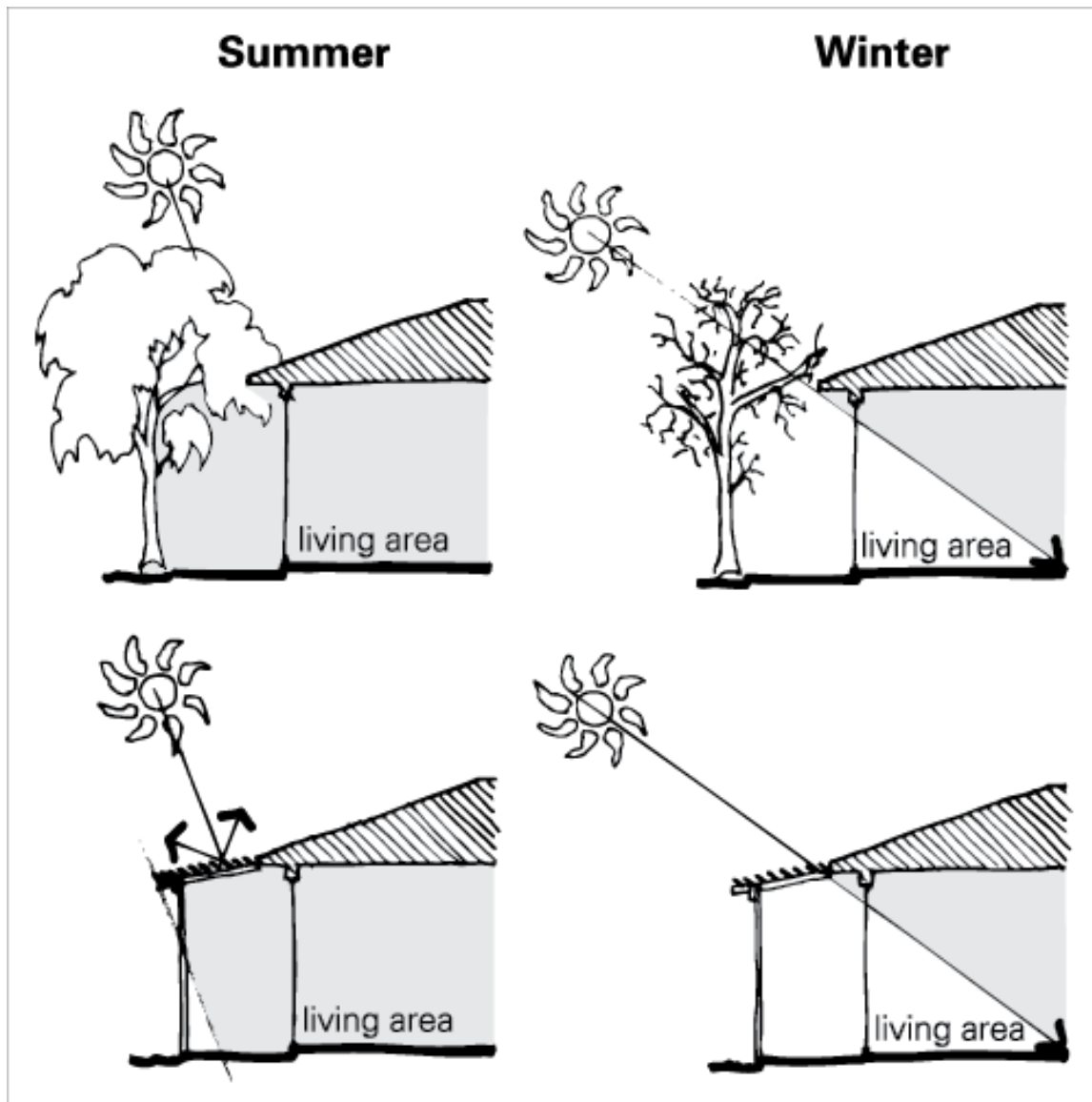
### ***Key building design responses***

#### Design considerations

- Always site for exposure to cooling breezes and design for cross-ventilation.
- Use thinner plans and design openings to encourage movement of breezes through and within the building.
- Always design for night-time sleeping comfort.
- Provide screened and shaded outdoor living areas.

#### Windows and shading

- Avoid overuse of glazing.
- If available or within budget use low SHGC (solar heat gain coefficient) glazing and low U-value glazing.
- Shade all east and west-facing walls and glass year round (see Shading).
- Provide shading to southern windows to eliminate high angle summer sun, but also allow lower winter sun to penetrate windows.
- Use 100% openable windows area such as louvre or casement.
- Provide south facing glass area of approximately 10% of the floor area. Eg. a 100m<sup>2</sup> room should have around 10m<sup>2</sup> of glass.



## Insulation

- Reflective foil type insulation works well in the roof to reflect unwanted summer heat, together with bulk insulation to keep winter warmth inside the building.
- Insulate internal wall surfaces from any external thermal mass (e.g. brick veneer).
- Use highly breathable reflective vapour barriers in walls and add bulk insulation to rooms that are air conditioned.

- Ventilate the roof space to vent heat build-up and to remove excess moisture and condensation.

## Heating and cooling

- Avoid auxiliary heating as it is unnecessary with good design.
- Provide ceiling fans in all living and sleeping spaces to induce air movement for summer cooling.

## Construction systems

- Use concrete slab on ground where deep ground temperatures are less than 19°C in summer. In multi-level buildings lightweight flooring systems above the ground floor are better to avoid storing too much heat. Good cross-ventilation should be available in rooms with concrete slabs or heavyweight walls to absorb excess heat.
- Any exposed thermal mass walls should be well shaded from the summer sun. Insulate the external side of heavyweight walls where possible. Alternatively construct lightweight timber walls which are well insulated.
- Choose light coloured roof and wall materials.
- Sleeping spaces are best housed in lightweight construction with access to good cross-ventilation.

