The claims are:

1. An air conditioning system operable to treat a conditioned space by treating outdoor air from outside the conditioned space and return air from inside the conditioned space, and mixing the treated outdoor air with the treated return air to form supply air for the conditioned space, the air conditioning system comprising:

    an outdoor air latent cooling treatment stage operable to provide parallel airflow with a return air sensible cooling treatment stage;

    a mixer to mix the treated outdoor air with the treated return air to form the conditioned space supply air;

    a first relative humidity controller operable to monitor the treated outdoor air relative humidity and separate the treated outdoor air from saturation to maintain relative humidity in treated outdoor air ducting below a predetermined mould growth limit; and

    a second relative humidity controller operable to monitor the conditioned space supply air relative humidity and separate the conditioned space supply air from saturation to maintain relative humidity in conditioned space supply air ducting below a predetermined mould growth limit;

    wherein the outdoor air latent cooling treatment stage includes at least a dehumidification heat exchanger, combination pre-cooling and heat reclaim heat exchangers, and a heat transfer pump, and

    wherein the return air sensible cooling treatment stage includes at least a sensible cooling heat exchanger.

2. The air conditioning system according to claim 1, wherein energy required for dehumidification in the outdoor air latent cooling treatment stage also sensibly cools the outdoor air stream, by the use of a closed heat reclaim loop to pre-cool the outdoor air stream using a chilled water system and shift the energy to the heat reclaim heat exchanger with the heat transfer pump.

3. The air conditioning system according to claim 2, wherein the amount of energy shifted to the heat reclaim heat exchanger is determined by either the conditioned space sensible heat load requirement or the relative humidity limits of the treated outdoor air.

4. The air conditioning system according to claim 3, wherein when the energy shifted is insufficient to achieve either the conditioned space sensible heat load requirement or the relative humidity limit of the treated outdoor air, an additional sensible heating heat exchanger is incorporated in the outdoor air latent cooling treatment stage.

5. The air conditioning system according to claim 1, wherein the first relative humidity controller monitors the treated outdoor air relative humidity by way of an outdoor air stream relative humidity input device that measures the outdoor air stream relative humidity and provides it as an input to an outdoor air stream relative humidity management system, the outdoor air stream relative humidity management system being operable to separate the outdoor air stream dry bulb temperature from a saturation curve to limit relative humidity within the outdoor air stream ducting.

6. The air conditioning system according to claim 5, wherein separation from the saturation curve is provided by increasing the dry bulb temperature of the outdoor air stream and thereby decreasing the relative humidity of the dehumidified condition of the outdoor air stream.

7. The air conditioning system according to claim 1, wherein the second relative humidity controller monitors the conditioned space supply air relative humidity by way of a conditioned space supply air stream relative humidity input device that measures the conditioned space supply air stream relative humidity and provides it as an input to a conditioned space supply air stream relative humidity management system, the conditioned space supply air stream relative humidity management system being operable to separate the conditioned space supply air stream dry bulb temperature from a saturation curve to limit relative humidity within the conditioned space supply air stream ducting.

8. The air conditioning system according to claim 7, wherein separation from the saturation curve is provided by increasing mass flow within either or both the outdoor air pre-cooling and heat reclaim heat exchangers heat transfer circuit.

9. The air conditioning system according to claim 7, wherein separation from the saturation curve is provided by increasing mass flow within either or both the outdoor air pre-cooling and heat reclaim heat exchangers heat transfer circuit, and by altering conditioned space set points, either dry bulb or relative humidity or both.