TOPICS:

1. **HEAT TRANSFER**
   - Conduction: \( Q = UA \Delta T = \frac{R \Delta T}{A} \quad q = \frac{(T_{in} - T_{out})}{A} \)
   - Convection: \( Q = h_{conv} \Delta T \)
   - Radiation: \( Q = h_{rad} \Delta T \)

2. **HEAT CAPACITY & MASS TRANSFER**
   - Thermal Storage: \( \Delta E_{therm} = mc \Delta T = \int Vc_p \Delta T \)
   - Mass Transfer (eq: Air Movement)
     \( \Delta E = E_{in} - E_{out} \)
     \( \Delta Q = (p_g \rho V) \Delta T = 0.018 V \Delta T \)
     \( V = \frac{1}{(ACH)} \frac{60 \text{ min}}{h} \)

3. **STEADY STATE FOR A ROOM**
   \( \Delta Q = 0 = Q_{\text{BOUND}} + Q_{\text{SOLAR}} + Q_{\text{AIR INFILTRATION}} + Q_{\text{EQUIP}} + Q_{\text{LIGHTS}} + Q_{\text{PEOPLE}} \)
   - Genuine Conduction, Radiation & Convection

4. **SOLAR GEOMETRY:** Understand Solar Path Diagrams
   - Altitude, Azimuth & Time of Year
   - Understand Solar Heat Gain Factors Chart (SHGF)

5. **GLAZING:**
   - \( Q_{\text{RADIATION}} = (\text{SHGF})(S_c) A \quad S_c: \text{SHAD/SC COEFFICIENT} \)

6. **INDOOR AIR QUALITY (IAQ) EQUATION:**
   \( V = V_{\text{sup}} A \quad \frac{f^3}{min} \)
   \( C_i = S.A. \times \text{CONTAMINANT CONCENTRATION} \quad \frac{f^3}{min} \)
   \( N = \text{CONTAMINANT GENERATED WITHIN SPACE} \quad \frac{f^3}{min} \)
   \( C_r = \frac{\text{AVERAGE CONTAMINANT CONCENT. IN SPACE}}{f^3} \quad \frac{f^3}{f^3} \)