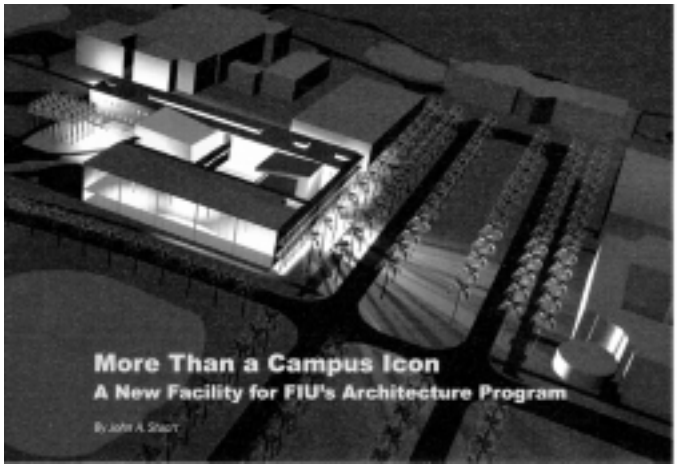
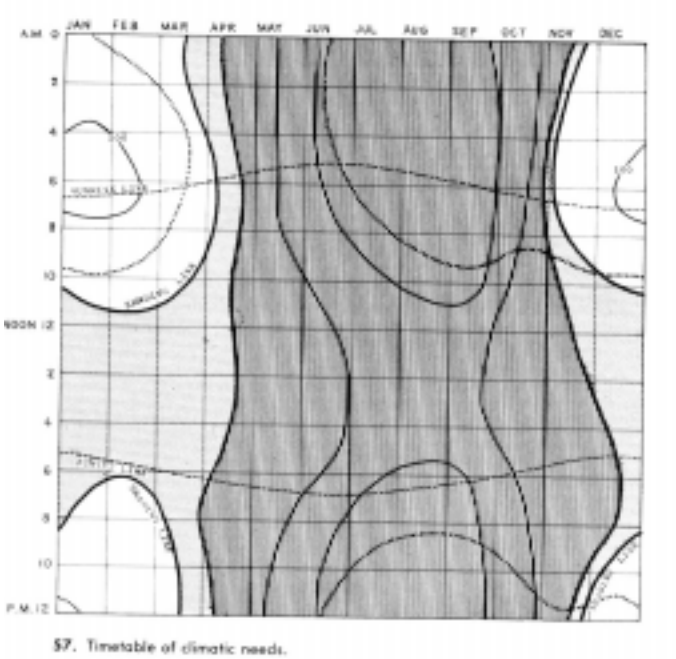
Arch 464
ECS
Spring 00 Name_____

Quiz #1

"Preparing for the Tschumi"





57. Timetable of climatic needs.

The dark area is overheated, lighter is comfort, white is cool.

For this problem you are the HVAC consultant for integration of a mechanical system into the competition-winning design for the new architecture building at Florida International University in Miami, Florida. The design of the building is very schematic, which is good since "concerns for the inclusion of natural ways to provide climate control in a subtropical environment seem to be ignored in the face of air-conditioned offices sporting small, punched windows."

The basic scheme features a studio wing and an office wing separated by courtyards and two pavilions, one containing a lecture hall and a terrace and the other containing reading rooms, a gallery, and print rooms. The design team described this scheme thusly: "The Bernard Tschumi/Bruno-Ellis competition entry offers a straightforward solution that highlights the need for flexibility in the creation of space for architecture education. Student studios are located in loft spaces in the northern bar, characterized by northern light coming through a wall of glass. Faculty and administration offices are housed in the south bar, characterized by small windows, one for each office. A courtyard that contains the tile-covered, colored "generators" connects these two. The yellow generator houses the gallery and the student reading room. The red generator provides a lecture hall and covered terrace. In addition, a green generator was conceived in the form of a poetic space of palm trees and water. The faculty and students work in their offices and studios as individual workstations, but come together in the collective units of lecture hall, gallery, reading room, and coffee shop."

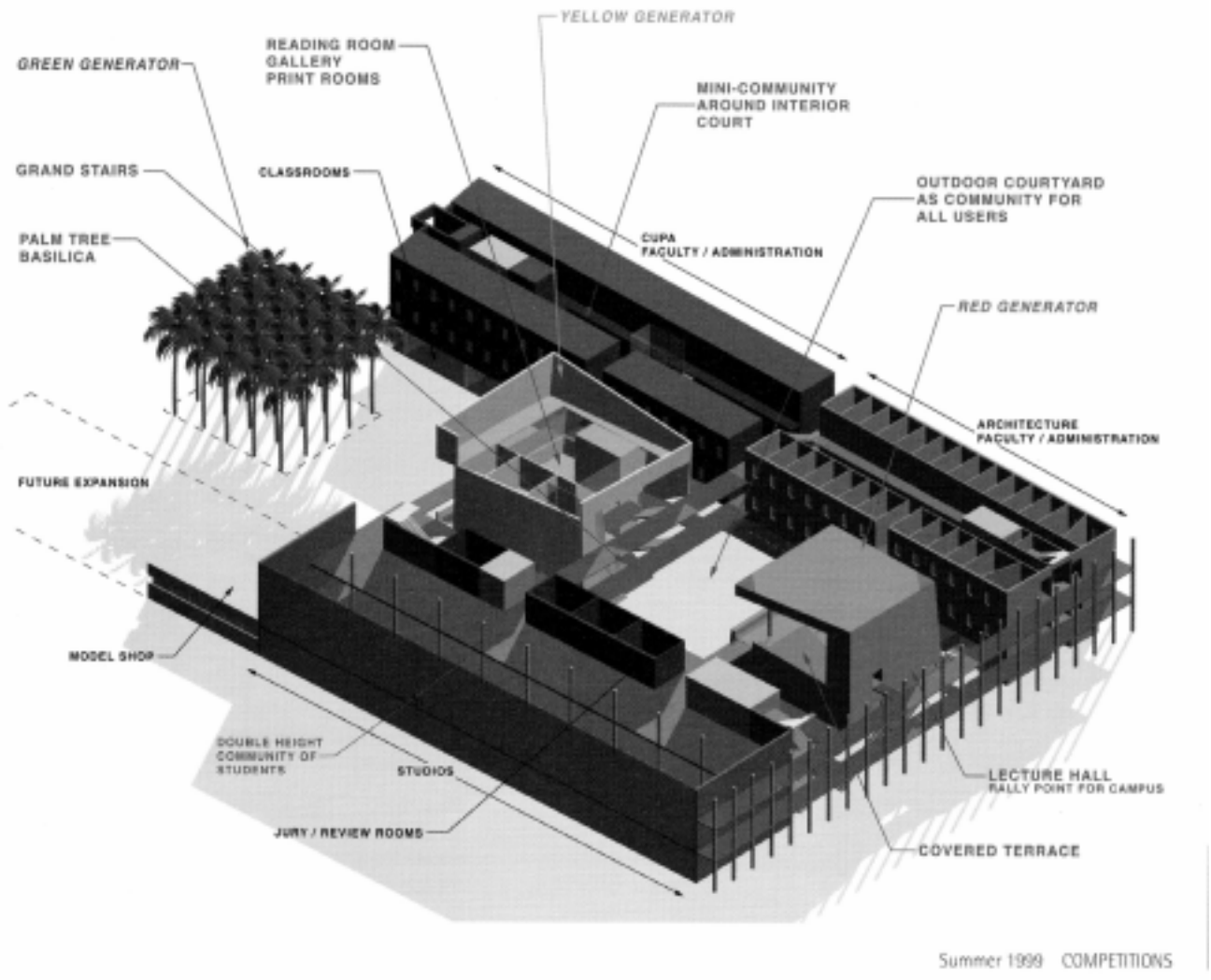
Climatically, the site experiences very humid, mild to hot weather year-round.

Your task is to schematically integrate the necessary HVAC systems with the structural and spatial systems of the design while following the architect's intentions for the building.

5 pts

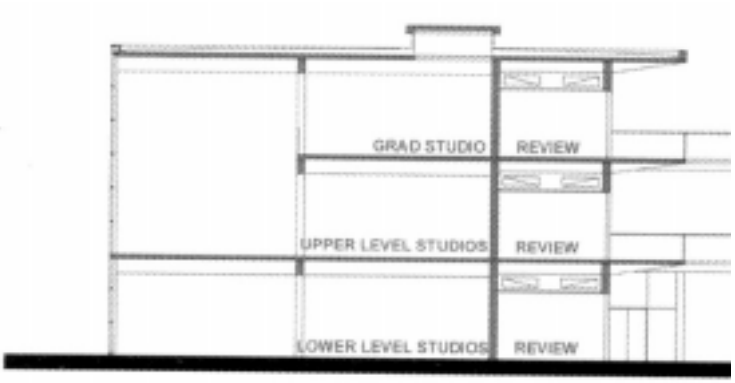
Choices for HVAC are limited to direct expansion (DX), multisense, single duct, variable volume (VAV), dual duct, and three-pipe.

1. Should a single HVAC system be used to serve all four buildings of the architecture school? Explain why or why not, citing climatic, thermal, and programmatic implications. Explain where the mechanical room(s) and cooling tower(s) should be located. Use the diagram below to illustrate your idea.



5 pts

2. Concentrating on the studio wing, explain how your scheme would integrate the vertical and horizontal supply and return ducts/pipes as well as fresh air intake. Support your idea with an annotated integration diagram.



North–south section of studio wing.