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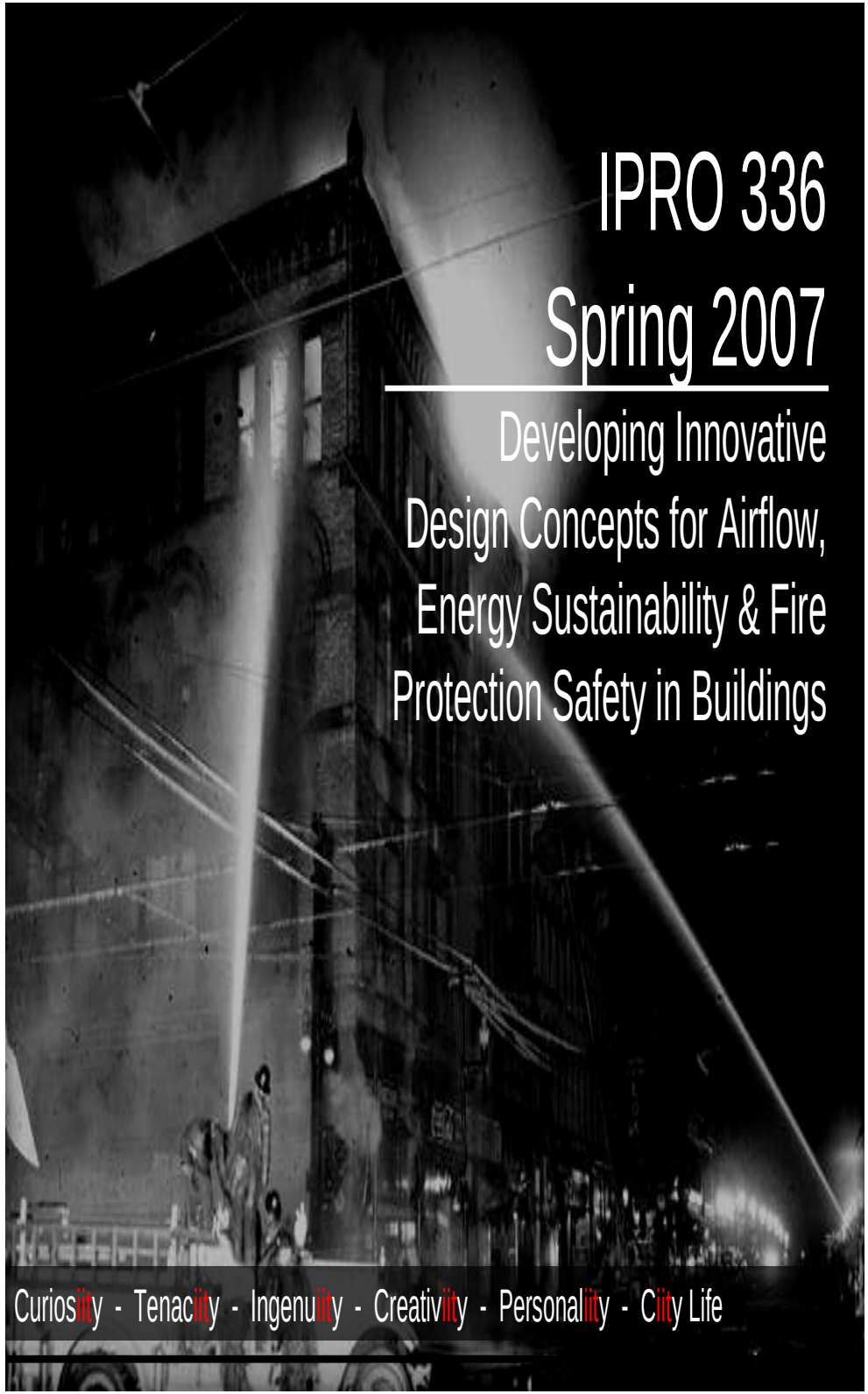


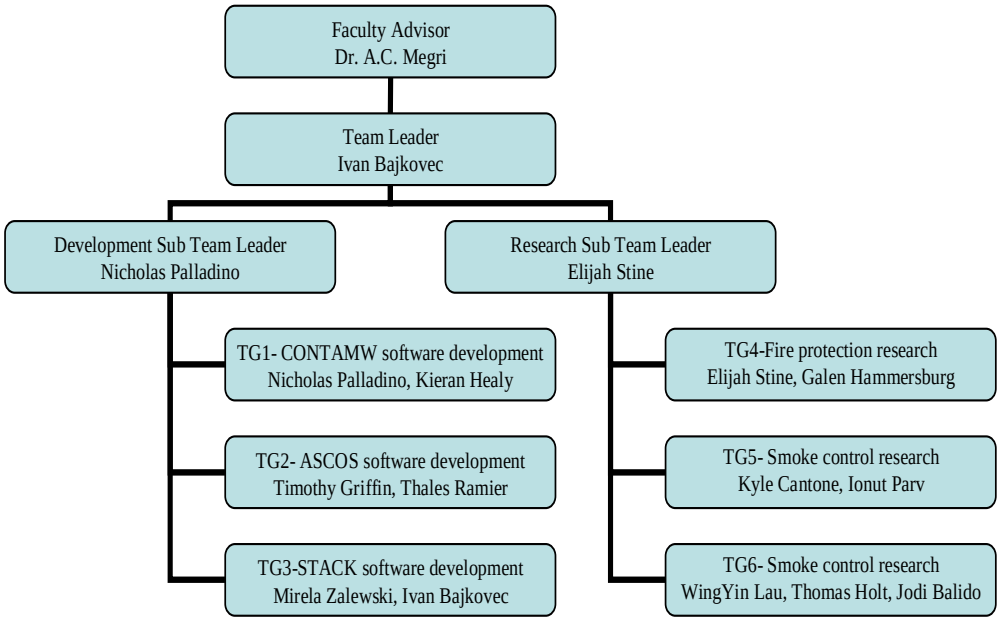
IPRO 336

Spring 2007

Developing Innovative Design Concepts for Airflow, Energy Sustainability & Fire Protection Safety in Buildings

Curiosiity - Tenaciity - Ingenuiity - Creativiity - Personaliity - Ciity Life

Organization:



Recommendations:

The results and conclusions of IPRO 336 can be expanded upon through more research, experimentations, and computer programming. Many smoke control professionals were contacted and interviewed to gather information for this IPRO and Chicago McCormick Place, was used as a case study. We have learned that the design of smoke control systems depends on the size, layout, and use of the building. For this reason, many other different types of buildings could be studied, many different strategies and designs for smoke control are sure to be found. Different buildings could also be utilized for experimental studies. Instead of using a blower door to simulate pressure differences between rooms, airflow experimentation could be done on many levels of a highrise building. The difference between the airflow through diffusers and returns could be collected and compared for a range of heights.

Objectives:

The IPRO 336 **Team** performed an original experimental study which helped to consequences of the stack effect phenomenon on pressure distribution and airflow movements within high-rise buildings. Specifically, the team was concerned with the effect that the phenomenon has on the movement of smoke (in case of a fire) and pollutant gases, which are directly related to the safety of the building inhabitants. Besides the experimental study, a review of the smoke control design process in buildings has been performed through series of interviews with experts in the Chicago area. Based on the experimental study, the information collected from the team's faculty advisor, Dr. Megri, and the interviews, a flowchart that depicts the innovative design process of smoke control in buildings has been developed.

Works Breakdown: