

### ***Research 1:***

#### **Chances of Mudslides due to post wild-fire rainfall followed by earthquake**

Southern California is frequently hit by wildfires. Rainfall after those wildfires threatens the residents for possible mudslides. Our students are doing research on the possibility of mudslides for different intensity of rainfall and different size earthquakes. Students will model in the Geotechnical Laboratory three or four slopes in Yorba Linda that were affected by the 2008 wildfire. They will use the same type of soil to make the slopes at the same density as in the field. Then, the barren slope will be supplied with artificially prepared rainfall of different intensity to check how the wet density of soil varies with rainfall and how that heavier soil affects the slope to trigger mudslides. Students will also measure the run out distance of the mudslide. Students will also shake those slopes with different magnitude earthquakes to check the extent of damage enhanced by the earthquake. A number of houses will be modeled at the foot of the slope to see how those houses will be destroyed with the mudslide. Appropriate arrangement of sandbags to protect the houses will also be assessed.

### ***Research 2:***

#### **Preparation of Intelligent Map System**

With the development of the robust “Geographic Information System” and a great improvement in the computer software, it has been possible to prepare an interactive map such as the “Google earth”. However, underground structures are still difficult to track in those surface maps. Our students will research on the possibility of incorporating the state-of-the-art GIS software and computer programs in the map of CalState Fullerton to make an Intelligent Map System. Using the facilities available in the state-of-the-art engineering surveying lab, our students will prepare a 1:1000 scale map of Calstate Fullerton. That map will incorporate all underground and surface infrastructures as far as possible. All infrastructures such as underground cable and gas lines as well as overhead electricity lines and also the features such as buildings, roads, parking lots and sidewalks can be searched just through an interactive “GIS window” and those infrastructures can be viewed in three dimensions. The map will also incorporate features that can tell a user the time it takes to travel from one building to the other as well as one room to the other. An emergency management system will also be incorporated that will help the campus community to evaluate the area effectively without congesting the tracks during emergency period. The system will identify the possible evacuation routes of a particular person depending on the location, floor and room he/she is in during the emergency.