

WEEK 1 SCHEDULE

TABLE 1. June 5-June 9

	Monday	Tuesday	Wednesday	Thursday	Friday
8:00-9:00	IDs				
9:00-10:00	IDs	Research	Research	Research	Research
10:00-11:00	Orientation (PB 136)	Research	Research	Research	Research
11:00-12:00	Presentations (PB 136)	Research	Research	Research	Research
12:00-1:00	Presentations (PB 136)	Lunch	Lunch	Lunch	Lunch
1:00-2:00	Lunch	Research	Research	Research	Research
2:00-3:00	Research	Research	Research	Research	Research
3:00-4:00	Research	Research	Research	Research	Research
4:00-5:00	Workshop (PB 134)		Footie	Colloquium (PB 192)	

Welcome BBQ at Tom's place 6 - 9 p.m.

Workshop: Introduction to \LaTeX .

Colloquium speaker: Alicia Prieto-Langarica (Youngstown State University)

Title: Mathematical Models for Bone Formation and Metabolism

Abstract: Bone remodeling is an elegantly orchestrated process by which osteocytes, osteoblasts and osteoclasts function as a syncytium to maintain or modify bone. On the microscopic level, bone consists of cells that create, destroy and monitor the bone matrix. These cells interact in a coordinated manner to maintain a tightly regulated homeostasis. It is this regulation that is responsible for the observed increase in bone gain in the dominant arm of a tennis player and the observed increase in bone loss associated with spaceflight and osteoporosis. The manner in which these cells interact to bring about a change in bone quality and quantity has yet to be fully elucidated. But efforts to understand the multicellular complexity can ultimately lead to eradication of metabolic bone diseases such as osteoporosis and improved implant longevity. Experimentally validated mathematical models that simulate functional activity and offer eventual predictive capabilities offer tremendous potential in understanding multicellular bone remodeling. Here we undertake the initial challenge to develop a mathematical model of bone formation validated with in vitro data obtained from osteoblastic bone cells induced to mineralize and quantified at 26 days of culture. A cellular automata model was constructed to simulate the in vitro characterization. Permutation tests were performed to compare the distribution of the mineralization in the cultures

and the distribution of the mineralization in the mathematical models. The results of the permutation test show the distribution of mineralization from the characterization and mathematical model come from the same probability distribution, therefore validating the cellular automata model.

Weekend Activity: Pa'san Ridge trail hike, San Joaquin River gorge. We leave from the dorms at 8:00 a.m.