

PREP Workshop *Mathematical Biology: Beyond Calculus*

Draft Schedule – 03/27/2010

Sunday, June 13

Participants Arrive

6:30 pm – 9:00 pm: Welcome Dinner
 Overview of Workshop (Robeva)
 Introductions
 Overview of Monday Activities (Hodge, Comar)

Monday, June 14

7:30 – 8:30 Breakfast

8:30 – 9:00 Welcome by Sweet Briar's administration (Jonathan Green, Dean of Sweet Briar)

9:00-10:00 Invited Address: *Trends in Modern Mathematical Biology* (Reinhard Laubenbacher, Virginia Bioinformatics Institute, Virginia Tech).

10:00 -10:30 Discussion on *Trends in Modern Mathematical Biology* with Reinhard Laubenbacher

10:30 – 11:00 Coffee Break / Informal Discussions

11:00 – 12:15 Lecture: Bio2010 and Math & Bio 2010: Models that Work – Review of Bio-calculus programs and courses in Mathematical Biology (Comar, Robeva)

12:15 – 1:30 Lunch

1:30 – 2:45 Lecture: Discrete Models in Systems Biology (Robeva)

2:45 – 3:45 Computer Lab: Sample activities on modeling with Boolean Networks (Robeva, Hodge)

3:45 – 4:15 Coffee Break / Informal Discussions

4:15 – 5:30 Lecture: Continuous Models in Systems Biology - Quantitative vs. Qualitative models (Robeva)

5:30 – 7:00 Dinner

7:00 – 9:00 Computer Lab: Sample activities on using Berkeley-Madonna (Robeva) and MS Excel (Comar)

Tuesday, June 15

- 8:00 – 9:00 Breakfast
- 9:00 – 10:00 Lecture: Linear Algebraic Approaches in Molecular Biology (Hodge)
- 10:00 – 10:15 Coffee Break
- 10:15 – 11:15 Computer Lab: work through sample activity and modules on metabolic pathway analysis (Hodge, Davies)
- 11:15 – 11:30 Coffee Break
- 11:30 – 12:30 Lecture: Risk Analysis Assessment of Variability in Biological Systems (Robeva)
- 12:30 – 1:30 Lunch
- 1:30 – 2:45 Probabilistic Methods: The Luria-Delbruck fluctuation test and the timing of evolutionary changes (Robeva)
- 2:45 – 4:00 Lecture: Phylogenetic tree reconstruction (Hodge)
- 4:00 – 4:30 Coffee Break / Informal Discussions
- 4:30 – 5:30 Activities: work through sample activity and modules on phylogenetic trees (Hodge) and Luria-Delbruck (Robeva) or (jointly) aspects of evolutionary models.
- 5:30 – 7:00 Dinner
- 7:00 – 9:00 Take-home Product: Organizers suggest a list of possible topics and participants identify the material they would like to take home from this workshop (from the suggested topics or choosing a topic of their own). Forming project teams by interests; Group discussions (all organizers)

Wednesday, June 16

- 8:00 – 9:00 Breakfast
- 9:00 – 10:30 Take-home product: workgroups (all organizers and participants)
- 10:30 – 11:00 Coffee Break/Informal Discussions
- 11:00 – 12:30 Special topics sessions by request/Project time/Lab time/Workgroups (all organizers and participants)
- 12:15 – 1:30 Lunch

1:30 – ?? Free time/Computer Lab time/ Library/Take-home products/Informal discussion (all organizers and participants)

Thursday, June 17

7:30 – 8:30 Breakfast

8:30 – 10:30 Concurrent Sessions: Wet lab for mathematics faculty/Mathematics classroom for biology faculty (Davies/Comar, Hodge, Robeva)

10:30 – 11:00 Coffee break / Informal Discussions

11:00 – 12:30 Take-home product (participants and organizers)
Concurrent special topics sessions (all organizers)
Software sessions by request (all organizers)

12:30 – 1:30 Lunch

1:30 – 2:45 Concurrent Lectures: Hidden Markov Models for DNA sequence alignment (Robeva); Lecture: Non-linear system, Groebner bases, and Mathematical Biology (Hodge)

2:45 – 4:00 Concurrent Software Demonstration: Computational Algebra Systems (Robeva, Hodge); BLAST (Davies)

4:00 – 4:30 Coffee Break / Informal Discussions

4:30 – 6:00 Take-home product: workgroups (all organizers and participants)

6:30 – 8:30 Reception and Closing Banquet

Friday, June 18

8:00 – 9:00 Breakfast

9:00 – 10:30 Presentations: Groups present their take-home product

10:30 – 11:00 Coffee Break

11:00 – 12:00 Presentations (continued); Final evaluations

12:00 – 13:00 Lunch

Departure