

SYLLABUS

Wk	Date 2006	Lab	Lecture
01	02 September	Material properties	Reynolds numbers
02	09 September	The three stages of fluid flows	Boundary layers
03	16 September	Boundary layers +	Stokes' and Bernoulli's laws
04	23 September	Drag, thrust, lift, streamlining	Flow microenvironments
05	30 September	Flow microenvironments; sediment transport	<i>Review</i>
06	07 October	<i>Exam I, emphasizing flow interactions with structures</i>	
		Lecture	Lab
07	14 October	<i>Fall Break</i>	
08	21 October	Solid & granular mechanics and the design of burrowers	Burrowing in mud
09	28 October	Suspension feeding	Suspension feeding
10	04 November	Diffusion in one to three dimensions; bacterial strategies	Stirring and mixing
11	11 November	Interacting advection and diffusion; large osmotrophs and animals with guts	<i>Review</i>
12	18 November	<i>Exam II, emphasizing mass transfer</i>	
13	25 November	Getting information (lecture)	Using information (lecture)
14	02 December	Unsteady flows (lecture/lab)	Swimming (lecture)
15	09 December	Pumps and miscellany (lecture)	<i>Review</i>
16	16 December	<i>Comprehensive Final, including sensory ecology and unsteady flows</i>	

The text for this course is:

Vogel, S. 1994. *Life in Moving Fluids: The Physical Biology of Flow*, 2nd Ed. Princeton Univ. Press, Princeton, NJ.

For wk 1 & 2, read Ch. 1 & 2. For wk 3, read Ch. 3 & 8. You will be asked to read Ch. 4-7, inclusive by wk 5, but you may find Ch. 4 confusing before the lecture on 16 September. It is OK to be confused for a while, but if you are, then read Ch. 4 again after that lecture. If you are still confused after rereading, please see me.

N.B.: This syllabus is tentative and will be revised based on interests, backgrounds and progress of the students enrolled. Look back and ahead, and suggest changes as we go.