Plan for 8.821, String Theory

as of 09.13.07.

1. overview.
2. classical bosonic strings, through regge trajectories [GSW §2.1, JP §1.2]
3. free quantum strings, lightcone quantization. [JP §1.3-4, GSW §2.3] critical dimension 1, string spectrum.
4. torus compactification, T-duality [JP ch 8]
5. CFT 1 [JP ch2] OPEs, vertex operators and interactions.
6. CFT 2 [JP ch2]
7. gauge fixing, critical dimension 2 [JP ch 3] NLSM, beta functions and EOM [end of JP ch 3] on-shellness and conformal invariance.
8. measure for moduli [JP ch 5], tree level amplitudes [JP ch 6]
9. one loop amplitudes, modular invariance [JP ch 7]
10. D-branes, worldvolume gauge theory [JP ch 8]
11. superstring worldsheet technology [JP ch 10]
12. superstring spectrum, including heterotic strings. [end of ch 10]
13. string duality (Batman lecture) [JP ch 12]
14. open-closed duality
15. black hole microstates.
16. AdS/CFT 1
17. CY compactification
18. heterotic on CY, some phenomenology
19. orbifolds
20. supersymmetric sigma models
21. GLSM
22. seiberg-witten
23. the conifold
24. AdS/CFT 2, warping
25. flux vacua, throats, the potential for moduli, supercritical strings.