	TENTATIVE SCHEDULE FOR PHYSICS 798S, SPRING 2016, Prof. Anlage						
Date	**Mtg.#**	**Tinkham**	**Annett**	**Waldram**	**Orlando+Delin**	**Ketterson+Song**	**Topics**
Week 1							
26-Jan	1	1.1-1.9	3.1-3.6	1.1-1.6, 3.1, 3.4	1.1-1.4	1, 4	Introduction to the course, 3 Hallmarks of SC, phenomenology, thermodynamics
28-Jan	2	1.2, 2.1, 2.2	3.8	2.1-2.6	2.4-2.6, 3.1-3.2	2	London's Eqs., penetration depth, screening of a magnetic field
Week 2							
2-Feb	Class moved to Week 5						
4-Feb	3	1.3, 2.5		2.1, 2.2, 10.12	3.4-3.5, 4.1-4.2	3	SC electrodynamics, Two-fluid model, complex conductivity
Week 3							
9-Feb	4	1.7		2.6-2.7	5.1-5.5	7	Macroscopic Quantum Model of SC, fluxoid quantization
11-Feb	5	1.4, 3.1, 3.2	6.3	7.1-7.3		25	Cooper pairing instability
Week 4							
16-Feb	6	3.2, 3.3, 3.4	6.1-6.2	7.2, 7.10, 16.11-16.13	10.4	31	Origin of the attractive interaction, dynamic screening, isotope effect, Coulomb repulsion
18-Feb	7	3.3	5.1-5.4	Appendix		26	BCS Theory I, creation/annihilation operators
Week 5							
22-Feb	8	3.3, 3.4	5.7, 6.4	7.3-7.5			BCS Theory II, ground state WF
23-Feb	9	3.4, 3.5	6.5	7.6-7.7		27	BCS Theory III, variational calculation, excitations
25-Feb	10	3.6	6.6	7.8		28	BCS Theory IV, finite temperature
Week 6							
1-Mar	11	3.6		7.9, 8.1	10.5	28	BCS Theory V, gap function, Tc, thermodynamic properties
3-Mar	12	3.7	6.7	8.2-8.7		50	BCS Theory VI, coherence effects
Week 7							
7-Mar	13	10.1		10.1 - 10.8		36, 45	Inhomogeneous SCs - The Bogoliubov-de Gennes Equations
8-Mar	Class moved to previous day						
10-Mar	Class moved to following day						
11-Mar	14	4.1	4.1-4.4	4.1-4.2	10.1-10.2	9, 45	Ginzburg-Landau (GL) Theory, free energy expansion
		SPRING BREAK / APS March Meeting in Baltimore					
Week 8							
22-Mar	15	4.2	4.5-4.7	4.3-4.6	10.3	12	GL differential equation, boundary conditions, coherence length
24-Mar	16	4.3, 4.4, 11.6		4.7, 4.9	6.1	6	Domain wall energies, Type I, II SCs, critical current, SC nanowires
Week 9							
29-Mar	17	4.8, 4.11	4.8-4.9	4.10, 5.5-5.6	6.5	10, 14	H_c2 and Abrikosov vortices
31-Mar	18	5.1			6.2-6.3	7, 8	H_c1 and structure of an isolated vortex
Week 10							
5-Apr	Class moved to Friday						
7-Apr	Class moved to next Monday						
8-Apr	19	5.2, 5.4	4.11	5.7-5.11	7.1-7.5	20	Theory of vortex interactions, flux flow resistivity, pinning
Week 11							
11-Apr	20	6.1, 6.2	5.8	6.1-6.5, 8.8-8.10	8.1-8.2	15, 30	The Josephson Effect, gauge-invariant phase, current-phase relationship
12-Apr	21	6.4		6.6-6.8	8.5-8.6	15	Josephson junction (JJ) magnetic diffraction, Josephson vortices
14-Apr	22	6.3		6.1-6.3	9.1-9.4	15	The RSJ model of the JJ, Shapiro steps
Week 12							
19-Apr	23	6.5	5.9	18.3-18.7	8.4, 9.5		The RF SQUID, DC SQUID, SC QuBits
21-Apr	24	8.1, 8.6	4. 10	15.9-15.12		21, 22	Fluctuations in superconductors (GL treatment), Time-Dependent GL
Week 13							
26-Apr	25	8.3, 8.4, 8.6, 8.7		15.11		22	Fluctuation conductivity
28-Apr	26	8.2		17.6			Kosterlitz-Thouless phase transition theory
Week 14							
3-May	27	11.5.1, 11.5.2				47.3	Andreev Scattering - BTK model
5-May	Class moved to next Monday						
Week 15							
9-May	28		7.1-7.4			53	Superfluidity in He-3 and Unconventional SCs
10-May	29	9.1 - 9.9	7.5	16.1-16.13, 17.1-17.11		31.2	Theories of the HTS pairing mechanism