Lecture Plan for FYS 3610 (Romfysikk), Autumn 2013

Lectures: Tuesday 08:15-10:00 Room V316 Chemistry Building
Wednesday 10:15-12:00 Room V316 Chemistry Building
Seminar: Friday 12:15-14:00 Room V316 Chemistry Building

Curriculum: Basic Space Plasma Physics, Baumjohann & Treumann, ICP (BSPP)
Physics of the Earth's Space Environment, Proelss, Springer, (PESE)

3 hours written mid-term examination (counts 20%)
Project work (counts 20%)
Oral examination (counts 60%)

Week	Topic	Keywords	Curriculum	Lecturer
34	Introduction, plasma basics	Gyration, 1st order drifts, magnetic mirror, loss cone	BSPP Ch. 2 PESE Ch. 5.3	LBNC
35	Magnetohydro-dynamics	Particle distribution function, Vlasow equation, MHD equations, magnetic reconnection, Debye length, plasma frequency	BSSP Chs. 1.1, 6.1, 6.2, 6.5, 7.3	LBNC
36	The Sun	Internal structure, atmospheric layers, dynamics	PESE Ch 3.1 lecture	LBNC
37	Solar wind	Properties, Parker model, Parker spiral , sectoring & current sheets, radial dependence	PESE Chs. 6.1 & 6.2	LBNC
38	Structure of the magnetosphere	Internal magnetic field, spherical harmonic expansion, dipole description, Chapman-Ferraro current, tail current	PESE Chs. 5.2, 6.4, 6.5	LBNC
39	Structure of the ionosphere	Ionization profile, D-, E-, F-layer,dynamics	PESE Chs. 3.2, 4.1-4.4	LBNC
40	Structure of the atmosphere	Composition, thermal structure, vertical profiles of state parameters	PESE Chs. 2.2 & 2.3	LBNC
41	Midterm exam			
42	Open magnetosphere	Dungey cycle, corotation, convection, ECPC	BSSP 5.2-5.4	LBNC
43	Ionospheric conductivity and currents	Pedersen & Hall conductivities & currents, collision frequencies and mobilities, region 1/2 currents	BSSP 4.2, 4.4 PESE 7.2 7.3	LBNC
44	MHD waves and space weather	Alfven & fast waves, space weather	BSSP 9.4 PESE 6.3	LBNC, YJ
45	Substorms and aurora	generation of aurora, proton aurora, substorm phenomenology	BSSP 5.6 PESE 7.4, 8.1	JM
46	Instrumentation	Incoherent & coherent radars, magnetometers, all-sky imagers	lecture	JM
47	Reports, repetition			
48	Exam			