



SCHOOL PLAN

<b>University Unit:</b> Engineering school		
<b>Graduate program:</b> Geospatial Sciences and Applications		
<b>Curse:</b> <input checked="" type="checkbox"/> Academic Master <input type="checkbox"/> Professional Master's <input checked="" type="checkbox"/> Doctorate degree		
<b>Discipline :</b> <b>Electrodynamics</b>		
<b>Teacher (s):</b> Carlos Guillermo Giménez de Castro ou Sérgio Szpigel		
<b>Note:</b> <p>The Geospatial Science and Applications course is a multidisciplinary course encompassing research in Solar Physics, Terrestrial Solar Relations, Astronomy, Particle Physics and others. The course subjects reflect this multidisciplinary nature and often require more than one teacher, who specializes in topics of the same discipline.</p>		
<b>Workload:</b> 48 h	<b>Credits</b> 4	<input type="checkbox"/> Required <input checked="" type="checkbox"/> Optional <input type="checkbox"/> Eleffective
<b>Description:</b> Review of Electromagnetism. Theorem of Green-Ostrogradsky and Stokes-Ampere's Theorem. Polarization field; Gradient fields and scalar potential; Rotational fields and vector potential. Local equations and integral equations. Maxwell Equations: continuity Equation; Maxwell's Equations in a vacuum; Maxwell's Equations in matter; Boundary conditions. Waves: wave Equation; waves in one dimension; electromagnetic waves in a vacuum; Electromagnetic energy, Poyinting vector; Electromagnetic waves in matter; Absorption and dispersion; Polarization. Physics of space plasmas. Movement of a particle. Movement of particles in electric and magnetic fields. Basics of plasma kinetic theory: from kinetic theory to Magneto-hydrodynamic (MHD) equations. Magneto-hydrodynamic theory. Magneto-hydrodynamic waves. Waves and instabilities in plasmas, fluid approach. Introduction to the kinetic theory of waves.		
<b>Program content:</b>		
<b>Evaluation criteria</b> <p>According to the General Regulation of Stricto Sensu Post-Graduation, Art. 98: A - excellent: corresponds to grades in the interval between grades 9 and 10; B - good: corresponds to grades in the interval between grades 8 and 8.9; C - regular: corresponds to grades in the interval between grades 7 and 7.9; R - disapproved: corresponds to grades in the interval between degrees 0 and 6.9 "</p>		



**Bibliography:**

- Griffiths, D. J., Introduction to Electrodynamics, 3a ed., Prentice-Hall, 1999.
- Jackson, J. D., Classical Electrodynamics, Wiley, 1998.
- Kraus, J. D., Eletromagnetics with applications, 5a ed., McGraw-Hill, 1999.
- Machado, K. D., Teoria do Eletromagnetismo, Editora UEPG, 2000.
- Marion, J. B. e Heald, M. A., Classical Electromagnetic Radiation, 3a ed., Dover, 1995.

**Schedule**

Date	Theme