SCHOOL PLAN

University Unit:
Engineering school

Graduate program:
Geospatial Sciences and Applications

Curse:
☒ Academic Master ☐ Professional Master's ☒ Doctorate degree

Discipline :
Astrophysics

Teacher (s):
Adriana Benetti Marques Valio
Luiz Cláudio Lima Botti
Discipline of a multidisciplinary nature

Note:

The Geospatial Science and Applications Program is multidisciplinary, encompassing research in several lines. The disciplines of the Program reflect this multidisciplinarity and require, many times, several professors, specialists in different topics, studied in the disciplines.

Workload:	**Credits**	
48 h	4	☐ Required ☒ Optional ☐ Eleffective

Description:

Introduction of the basic concepts of Astrophysics and the description of the objects that make up the Universe. Introduction of the Hertzsprung-Russell diagram; study of the stars taking as an example the Sun. Introduction of the physical processes of great relevance to stellar interior and atmosphere. Studies of the interaction of radiation and matter, atmosphere, convective envelopes and stellar winds. Nuclear energy as an energy source for stars and nucleosynthesis of chemical elements. The course also discusses the astrophysical aspects related to the various stages of stellar evolution, from its formation to its end as a white dwarf, nova, supernova, neutron star or black hole. Star clusters and binary stars. Globular clusters, constituents of the interstellar medium and our Galaxy, the Milky Way. Galaxy classification and their mass distribution, active galaxies, quasars. Clusters of galaxies and the expansion of the Universe. Theory of gravitation and cosmology, Big Bang, cosmic microwave background radiation.

Program content:

List of themes, subjects and concepts that will be studied in the stage.

Evaluation criteria

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 "

Bibliography:

– An Introduction to Modern Astrophysics, Carrol, B. W., Ostlie, D. A. Pearson, 2nd ed. 2007.
– The Physical Universe, Shu, F. H. University Science Books, 1982.
– Astrophysics I: Stars, Bowers, R. L., Deeming, T. Jones and Bartlett Publishers, 1984.
– Astrophysics II: Interstellar Matter and Galaxies, Bowers, R. L., Deeming, T. Jones and Bartlett Publishers, 1984.
– Einstein Gravity in a Nutshell, Zee, A. Princeton University Press, 2013.
– An Introduction to Active Galactic Nuclei. Peterson, B. M. Cambridge University Press. 1997.
– O Big Bang - A Origem do Universo. Silk, J. Gráfica Editora Hamburg. 1988.
– Gribbin, J. The Universe: A Biography. Penguin Group. 2009
– Beams and Jets in Astrophysics. Hughes, P. A. Cambridge Astrophysics Series, 1991.
– Physical Foundations of Cosmology. Mukhanov, V. Cambridge University Press, 2005.

Schedule

Date	Theme