



MINISTÉRIO DA EDUCAÇÃO
Fundação Universidade Federal do ABC
Reitoria

Av. dos Estados, 5001 · Bairro Santa Terezinha · Santo André - SP
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OFFICIAL NOTICE Nº 118/2018

Opening of public service examination for the position of Adjunct Professor rank A – level I, of the career of higher Education; Area: Physics; Subareas: Gravitation.

The Rector of Fundação Universidade Federal do ABC (UFABC), exercising the power conferred upon him, following the terms of the correspondent legal basis, the application opening Notice, with the objective of selecting candidates by the means of a public service examination for the position of Professor of higher Education with the following conditions and characteristics:

1. CONDITIONS AND CHARACTERISTICS:

1.1. Class: Rank A - Level 1 / Work regime: Full-time (40h per week) and Exclusive Dedication / Legal Basis: Laws nº 7.596/1987, 8.112/1990, 9.394/1996, 12.772/2012, 12.863/2013, 12.990/2014 and 13.325/2016, and the Decrees nº 3.298/1999, 6.944/2009 and 7.485/2011 and changes, Interministerial Ordinance nº 399/2016 Ordinance nº 450/2002 / MPOG / Openings: 1 (vacancy).

1.2. Application Period: 05/12/18 from to 05/02/19;

1.2.1. Period for requesting a fee waiver, referring to item 7 of Official Public Notice of General Conditions nº 96/2013: 05/12/18 from to 05/01/19.

1.3. Application Fee: 239,00

1.4. Remuneration:

Basic Remuneration	4.455,22
Compensation by Degree (Doctor's)	5.130,45
Starting Remuneration (Doctor)	9.585,67

1.5. Area: Physics / Sub-area: Gravitation.

2. PROGRAM FOR THE EXAMINATION TESTS

2.1 For the written test: The written test is composed of two parts. For the first part, the examination committee shall propose a list of at least three topics related to the following items:

- Basic principles and fundamentals of General Relativity;
- Weak gravitational fields and gravitational waves;
- Classical tests of General Relativity;

- d) Schwarzschild solutions and black holes;
- e) Friedman cosmological models;
- f) Accelerated expansion of the universe;
- g) The structure of compact objects.

The candidate will choose one of the topics proposed by the committee and elaborate a written essay on it. For the second part of the examination, which is common to all candidates, the examination committee will propose a series of questions about the above listed items, which shall be answered by all candidates indiscriminately.

2.2 For the test of teaching skills:

Electromagnetism: The Coulomb law. Electric field and electric potential. Gauss law. Electric current, electric resistance and the Ohm law. Magnetic field and the Ampère law. Faraday law. Induction and inductance. Electric and magnetic fields within matter. Maxwell equations. Electromagnetic waves.

Quantum Mechanics: Black body radiation. Wave-particle duality. Uncertainty principle. Hilbert space and quantum operators. The postulates of Quantum Mechanics. Schrödinger equation and applications to simple quantum systems. Potential barrier and quantum tunneling. Angular momentum and spin.

Special Relativity: The postulates of Special Relativity. Lorentz Transformations. Relativistic kinematics and relativistic dynamics. Covariant formulation of Maxwell equations.

3. SUGGESTED BIBLIOGRAPHY

3.1. For the written Test:

- a) R. D'Inverno, *Introducing Einstein's Relativity* (Clarendon Press);
- b) R. M. Wald, *General Relativity* (Chicago University Press);
- c) E. Kolb, M. Turner, *The early Universe* (Addison Wesley);
- d) S. L. Shapiro, S. A. Teukolsky, *Black Holes, White Dwarfs and Neutron Stars: The Physics of Compact Objects* (Wiley).

3.2. For the test of teaching skills:

- a) H. Moysés Nussenzveig, *Curso de Física Básica* (Edgard Blücher Ltda);
- b) R. B. Leighton, M. Sands, R. P. Feynman, *The Feynman Lectures on Physics* (Addison-Wesley);
- c) J. R. Reitz, F. J. Milford e R. W. Christy, *Foundations of Electromagnetic Theory* (Addison-Wesley);
- d) C. Cohen-Tannoudji, B. Diu e F. Laloë, *Quantum Mechanics* (Wiley);
- e) W. Rindler, *Introduction to Special Relativity* (Oxford University Press).

4. GENERAL CONDITIONS:

4.1. It is a constituent part of the current, the UFABC Official Public Notice of General Conditions nº 96/2013, available on: <http://www.ufabc.edu.br/concursos/docentes/inscricoes-abertas>

4.2. The validity duration of the examination will be of 01 (one) year counting from the date of publication of the “Edital de Homologação do Resultado Final do Concurso” (Official note of the final result of the examination), being allowed to be extended by an equal amount.

4.3. The exams must take place within 6 (six) months, after the publication of the “Edital de Homologação das Inscrições” (Official note of the confirmation of the applications).

4.4. The candidate, at the time of application to the public service examination, declares to be completely aware and to fully accept the rules and conditions established in this Notice, in the Official Public Notice of General Conditions and in the corresponding relevant law regulations.

4.5. And, in order to make it public to the interested parties, DISPATCH the current Notice.

Santo André, November 29th 2018.

Wagner Alves Carvalho
Reitor em exercício