

Field name	Description
University	„Constantin Brâncuși” University of Târgu-Jiu
Faculty	Faculty of Engineering
Department	Energy, Environment and Agrotourism
Position in the list	9
Rank	Associate professor
Disciplines	Fluid mechanics and hydraulic equipment Hydraulic machines Materials technology Ergonomics of medical devices Reliability of medical equipment
Scientific field	Industrial engineering
The description of the academic position	Associate professor position 9 - Department Energy, Environment and Agrotourism / Faculty of Engineering - position of associate professor, including teaching activities in the disciplines of the position put up for competition that are found in the curricula of undergraduate and master's degree programs within the faculty. The position also includes, in addition to teaching and assessment activities, consultations, the subjects in the curriculum included in the position put up for competition and tutoring activities. The position is put up for competition for an indefinite period.
Academic duties	Weekly teaching activity consisting of: 2 hours of course of laboratory in the discipline Fluid mechanics and hydraulic equipment; 2 hours of course in the discipline Hydraulic machines; 1 hour of laboratory in the discipline of Materials Technology; 2 hours of class and 1 hour of laboratory in the discipline Ergonomics of medical devices; 2 hours and 2 laboratory of course in the discipline Reliability of medical equipment. The position also contains scientific research activities in the field, according to the the Law no. 199/2023 on Higher Education, with subsequent amendments and completions, and the job description, which will be prepared as an annex to the employment contract.
Employment salary	8631 lei
Publication date on site UCB	29.11.2023
Starting and final dates of the registration	29.11. 2023 – 16.01.2024
Date, day of the week and hour for the promotion exam	01.02.2024 , 10 a.m.
Venue where the promotion exam	Faculty of Engineering, room 113, Targu Jiu, Gorj.
The dates for the competition tests, including lectures, courses, etc.	01.02.2024, 10 a.m.
Date of exam results communication	01.02.2024
Starting and final dates for contesting the results	02.02.2024 – 06.02.2024
Topics for preparing the promotion exam	For the candidates coming from higher education, the fulfillment of the national minimum standards for the position of associate professor in accordance with the Law no. 199/2023 on Higher Education, , with the MENCS Order no. 6129 / 20.12.2016, with the Methodology for teaching and research positions of the "Constantin Brâncuși" University of Târgu Jiu. Candidates who come from outside

the higher education system also take a test that consists of a public lecture, with the following theme:

**I. Discipline: Fluid mechanics and hydraulic equipment
Theme:**

1. Fluid statics

Fluid particle. Fluid model. Density. Specific weight. Capillarity. Viscosity. The equation of statics. Fluid rest equation, EULER equation. The fundamental relationship and its forms.

2. Kinematics

Study models. Notions of kinematics. The continuity equation. Transport theorem. Continuity equation for a current tube.

3. Fluid dynamics

Fluid motion equations (in EULER form). The initial and boundary conditions of the equation of motion. The equation of motion in the HELMOLTZ, GROMKA-LAMB form. BERNOULLI'S relations. The law of energy conservation and transformation. Graphic representation of the Bernoulli function. Applications of the Bernoulli function. The Navier-Stokes equation.

4. Similarity of hydraulic systems

The bases of the similarity theorem. Similarity criteria

5. Laminar movement

Movement regimes. Linear movement between two parallel plane walls. Linear movement in the pipe.

6. Boundary layer theory

The notion of boundary layer. Limit layer thickness. The equations of motion in the boundary layer.

7. Turbulent movement

Structure and turbulence. Theory of turbulent mixing. Speed distribution. Reynolds equations.

8. Fluid movement applied

Calculation of load losses. The principle of calculation of linear and local load losses. Classification of pressure pipes. Long pipes. Short pipes. Hit of a ram. The battering ram phenomenon in a rigid pipe.

9. Hydraulic machines and hydraulic equipment

Classification of hydraulic machines. Hydraulic turbines. Centrifugal pumps. Axial pumps. Hydrostatic pumps and motors. Operation of pumps in the network Hydrostatic pumps.

Bibliography:

1. Cioc Dumitru-Hidraulica, Didactic and Pedagogical Ed., Bucharest 1975.
2. Monica Ghiorgiu, Hydropneumatic equipment, Ed. Torch 1979.
3. Francisc Gyulai, Pumps, fans, compressors, IPTVT 1997.
4. Julieta Florea, Fluid Mechanics, Technical Ed. 1982, Bucharest.
5. Mihai Giurconiu- Installation hydraulics, Ed. Facla, 1989.
6. V. Nistoreanu, Water resource management and environmental impact, Ed. BREN 1999.

7. Bostan, I., Dulgheru, V. ș.a., Renewable energy conversion systems, Technica Info Publishing House, Chisinau, 2007.

8. Ciobanu, B., Hydraulic turbomachines. Part I. Turbogenerators, Iasi, 2008.

9. Florea, J., Isbășoiu, E.C.Gh., Hydraulics and hydraulic machines, Lito. Bucharest Polytechnic Institute, Bucharest, 1974.

12. Stematiu, D., Hydropower facilities, Conspress Publishing House, Bucharest, 2008.

II. Discipline: Hydraulic machines

Theme:

1. Classification of hydraulic machines

Classification of hydraulic machines. Hydropower installations. Pumping stations. Similarity of hydraulic machines. The power of arrangements.

2. The main parameters of hydraulic machines

The main parameters. System stability. The useful power and parameters from the connections. Dissipations, yield, energy balance

Calculation of the external energy characteristic. Cavitation phenomenon and cavitation curves.

3. Operating principles and fundamental equations

Principles of operation. The equation of hydraulic machines in speeds. The equation of hydraulic machines in angles. Transmission of power.

4. Hydraulic turbines

Networks of profiles. Notions regarding cavitation in the lapels. Hydraulic turbines with action. Jet turbines. Characteristic curves.

Power variation with fall. Energy production of a CHE. The inclusion of CHE in the load chart of the energy system.

5. Hydraulic generators

Types of generators. Driving devices in hydraulic generators. Open and closed circuit operation. Stability of the pumping system.

6. Bulky cars

Volume pumps with simple effect. Volume pumps with double effect. Axial piston pumps. Radial piston pumps. Gear pumps. Distribution and regulation equipment. Electrical Engineering

Bibliography:

1. Monica Ghiorgiu- Hydropneumatic equipment, Ed. Torch 1979

2. Francis Gyulai – Pumps, fans, compressors, IPTVT 1997

3. Julieta Florea – Fluid Mechanics, Technical Ed. 1982, Bucharest,

4. Iulian Florescu - Hydraulic machines - Course notes, Ed. Alma Mater, 2007, Bacau

5. Mihai Giurconiu- Installation hydraulics, Ed. Facla, 1989

8.V. Nistoreanu, The management of water resources and the impact on the environment, Ed. BREN 1999.

5. Bostan, I., Dulgheru, V. ș.a., Renewable energy conversion systems, Technica Info Publishing House, Chisinau, 2007.

6. Ciobanu, B., Hydraulic turbomachines. Part I. Turbogenerators, Iasi, 2008,
7. Florea, J., Isbășoiu, E.C.Gh., Hydraulics and hydraulic machines, Lito. Bucharest Polytechnic Institute, Bucharest, 1974.
8. Pavel, D., Zarea, Șt., Hydraulic turbines and hydropower equipment, E.D.P., Bucharest, 1968.
9. Seteanu, I., Hydraulics and hydraulic machines, Bucharest, Lito. Bucharest Polytechnic Institute, 1976.
10. Stematiu, D., Hydropower facilities, Conspress Publishing House, Bucharest, 2008

III. Discipline: Materials technology

Theme:

- 1. Metallic materials. Classification and symbolization.**
- 2. The metallographic optical microscope**
- 3. Preparation of metallographic samples**
- 4. Macroscopic analysis.**
- 5. Thermal analysis.**
- 6. Dilatometric analysis.**
- 7. Equilibrium structure of carbon steels and white cast irons.**
- 8. Classification of cast iron according to graphite characteristics.**
- 9. The structure of ordinary and special gray cast irons**
- 10. Structure of construction alloy steels.**
- 11. The structure of alloyed tool steels**
- 12. Alloy steels with special purpose**
- 13. Equilibrium structures of heat-treated steels and cast irons**

Bibliography:

1. Ciofu Florin, Alin Stăncioiu – Materials science and engineering. Laboratory guide, Brâncuși Academic Publishing House, 2011
2. Gîrniceanu, Gh., saddle. - Materials study. UCB reprography, Tue-Jiu, 1997.

IV Discipline: Ergonomics of medical devices

Theme:

1. Definition of ergonomics

The object of study of ergonomics, the definition of ergonomics, the typology of ergonomics and its interdisciplinary character. Introductory information.

2. The human subsystem

Organs apparatus systems. Orientation elements of the human body. Body parts and regions.

3. The locomotor apparatus at work

Bone system. Muscular system.

4. Anthropometric dimensions and their ergonomic value

Anthropometric dimensions and morphological and functional indicators. Positions of the human body at work.

5. The effects of work on the cardiovascular and respiratory system

The cardiovascular system. Respiratory system.

6. Sense organs and environmental conditions

Sensations and the visual analyzer. Sensations and the auditory analyzer. Sensations and skin analyzer.

7. The energy of the human body

Digestive system. Metabolism.

8. Work and fatigue

Forms of fatigue. Causes and symptoms of fatigue. Fatigue measurement. Prevention and mitigation of fatigue during work.

9. Ergonomics in relation to new information technologies

Visual stress induced by the use of computers: concerns about the effect of monitors on health, symptoms of visual stress, factors influencing visual stress.

Bibliography:

- 1..Burloiu, P. – Economy and ergonomic work organization, EDP, Bucharest, 1990;
2. Cărean M., Cărean A. – Ergonomic design of work systems, Ed. Dacia, Cluj-Napoca, 1998;
3. Dumitrescu, A. – Ergonomics, Printech Publishing House Bucharest, 2001;
4. Grandjean, E. – Principles of ergonomics, Scientific Publishing House, Bucharest, 1972;
5. Limbasan Georgiana – Study of work, Transilvania University Publishing House Brasov, 2005;
6. Adriana Manolescu – Power and information, CERTI Publishing Craiova, 1996;
6. Mihăilă I. – Scientific bases and applications of ergonomics, Medical Publishing House, Bucharest, 1982;
9. Purdea, D. – The ergonomic organization of work, Risoprint, Cluj-Napoca, 1999.

V Discipline: Reliability of medical equipment**Theme:****1. Definitions and classifications of reliability**

The notion of failure

2. Reliability indicators**3. Laws of distribution**

Calculation of the reliability of series type systems

Calculation of the reliability of parallel type systems

Calculation of the reliability of systems with mixed schemes

4. Special aspects of system reliability calculation

Conclusions related to ensuring a high level of system reliability. Predictive reliability. Allocation of reliability

5. Reliability and maintainability of medical devices

Essential medical equipment

Management of medical equipment

Life cycle of medical equipment

The Commission's Common Standards for Medical Equipment

6. Preventive maintenance of medical equipment

Computerized Maintenance Management Systems (CMMS)

Systematic class distribution of medical devices

7. Distribution model of medical devices

The evaluation model for medical equipment

Description of criteria and sub-criteria.

	Determining the weighting of values for criteria and subcriteria. Position and intensity for each criterion. Bibliography: 1. Antonescu, V., Stichițoiu, D., Elements of theory and collection of reliability, maintainability, availability problems, vol. I, II, Central Institute for the Electrotechnical Industry, Documentary Information Office, Bucharest, 1988 2. Baron T., Statistical methods for the analysis and control of production quality, Didactic and Pedagogical Publishing House, Bucharest, 1979 3. Cătuneanu, V., Theoretical bases of reliability, Academy Publishing House of the S.S.R., Bucharest, 1983 4. Ceaușu I., Managerial Encyclopedia, ATTR publishing house, Bucharest, 1998 5. Ceaușu I., Terotehnică și terotehnologie, Bucharest, 1988 6. Gafițanu M., Crețu S., Drăgan B., Vibroacoustic diagnostics of machines and equipment, Technical Publishing House, Bucharest 1989 7. Hohan I. Technology and system reliability, Didactic and Pedagogical Publishing House Bucharest 1982. 8. Năsui V., The bases of experimental research, Publishing House of the Northern University of Baia Mare, 2000 9. Stefan Grigoras, s.a.- Reliability of mechanical systems – laboratory guide, Iasi, 2013 10. Ungureanu N.S. Reliability, maintainability and availability of elements and systems, North Baia Mare University Publishing House, 2001
Description of the competition procedure	The competition takes place in accordance with the Competition Framework Methodology for filling vacant teaching and research positions in higher education approved by GD no. 457 of 04.05.2011, with subsequent amendments, Higher Education Law no. 199/2023, with subsequent amendments and the Methodology for the occupation of teaching and research positions of the "Constantin Brâncuși" University of Târgu Jiu approved in the Senate meeting of 27.10.2022.
List of documents	A1. The application for registration, signed by the candidate, which includes a statement on his own responsibility regarding the veracity of the information presented in the file; A2. Proposal for the development of the candidate's career both from the didactic point of view and from the point of view of the scientific research activities; the proposal is drafted by the candidate, comprises a maximum of 10 pages; A3. Curriculum vitae of the candidate in original form signed by the candidate on each page which must include: information about the studies carried out and the diplomas obtained; relevant professional experience and jobs; information on the research and development projects he/she has led as a project director or as a member, indicating for each source of funding; information on awards or other

elements recognizing the candidate's scientific contributions, other relevant information;

A4. List of papers of the candidate in printed format (original, signed on each page) will be structured as follows: the list of the maximum 10 papers considered by the candidate to be the most relevant for his own professional achievements, which are included in the file and electronic format in the file and which can be found in the other categories of papers provided for in this article; doctoral thesis or theses; books and book chapters; articles / studies, published in journals from the main international scientific stream; publications in extenso, published in papers of the main specialized international conferences; research/development-innovation projects on the basis of a contract/grant which he has led as a project director or in which he/she has acted as a member, indicating for each source of funding; patents and other industrial property titles; other works and scientific contributions or, as the case may be, in the field of artistic creation;

A5. Completion sheet of the post-specific standards completed and signed by the candidate in printed format (originally signed on each page).

A6. Documents regarding the holding of a doctor's degree. The legalized copy of the doctoral degree and, in case the original doctoral diploma is not recognized in Romania, the certificate of recognition or equivalence of it in legalized copy or the copy according to the Ministerial Order confirms the granting of the doctoral degree;

A7. Summary of the doctoral thesis in Romanian and in a language of international circulation (maximum one page for each language);

A8. Other diplomas attesting the candidate's studies: copies of other diplomas attesting the candidate's studies: (baccalaureate diploma, bachelor's degree, master's/advanced studies, Certificate attesting psycho-pedagogical training) or, if the original diplomas are not recognized in Romania, the certificates of recognition or equivalence thereof, copies of other diplomas attesting to the candidate's studies. Copies are signed by the candidate for certification "according to the original";

A9. Transcripts, diploma supplements or school statements issued for each cycle of study;

A10. Copy of identity card;

A11. Copies of documents certifying the change of name, if applicable (marriage certificate or proof of name change);

A12. Declaration on the candidate's own responsibility that he/she is not in any situation of incompatibility;

A13. Medical certificate showing that he is fit to carry out teaching activity;

A14. List of references with their contact details: for the position of associate professor, at least 3 names and contact addresses of personalities from the respective field, from the country or from abroad, outside the higher education institution whose position is being put up for competition,

	who agreed to draw up letters of recommendation regarding the professional qualities of the candidate. A15.- A16. Statement of responsibility, in original (handwritten) signed by the candidate. The statement must state the correctness of the data in the file and the fact that it relates to his own activities and achievements, otherwise the candidate will bear the consequences of making false statements, in accordance with the legislation in force. A17. The folder comprising a maximum of ten of the candidate's most significant papers, in electronic scanned form (CD / DVD), and the books and book chapters will be submitted in physical format. In addition, the electronic support will include the list of papers of the candidate cf. A4 in word format. A18. Document for paying the registration fee for the competition. A CD / DVD, or other electronic format, with all its scanned contents, including the folder with the 10 significant works, is attached to the competition file, in order to be sent to the competition commission.
Address where the competition file will be sent	"Constantin Brâncuși" University of Târgu-Jiu, The Street of Youth, no. 4, Târgu-Jiu, Gorj
Commission	
Methodology	Uploading doc, docx or PDF files. The maximum supported file size is 10MB.

Dean,
Assoc.Prof Cristinel Popescu

Department Director,
Prof.univ.dr.ing. Racoceanu Cristinel