MINISTERUL EDUCATIE
UNIVERSITATEA MARITIMĂ DIN CONSTANȚA
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Information about the job application contest for the position of
„ Associate Professor"
Department of Engineering Sciences in Mechanics and Environmental Domain,
position nr. 5 in the job title list
Faculty of Marine Engineering
Constanta Maritime University

a.) Description of position

Full-time entry 5 in the Department of Engineering Sciences in Mechanics and Environmental Domain, Faculty of Marine Engineering, Constanta Maritime University

Academic Subjects in the curricula:

- Numerical and experimental techniques for investigating naval propulsion systems;
- Automation of naval propulsion systems;
- Operation, repair and maintenance of internal combustion engines.

b) Tasks / Activities associated with the role

Teaching Load: Related duties /activities

Nr.	Type of Activity	Number of conventional hours
1.	Teaching Activities	4 h /week
2.	Supervision of Seminar, Labs, and Projects	4 h /week
3.	Guidance for the elaboration of the Bachelor thesis	4 h /week
4.	Guidance for the elaboration of the Master thesis	2 h /week
5.	Guidance for the elaboration of PhD thesis	____
6.	Research and Scholarly Activities enlisted in the Curricula	2 h /week

7.	Management of educational-artistic or sports activities	———
8.	Assessment Activities	2 h /week
9.	Tutoring, counseling, guidance of students' scientific groups, of students within the European Credit Transfer and Accumulation System	2 h/week
10.	Participation in councils and commissions in the interest of education, including admission and completion of studies committees	2 h/week
11.	Self-Study	8 h /week

Research Load

Nr.	Type of Activity	Number. of conventional hours
1.	Research Activities	10 h /week

c.) Minimum wage for classification

No.	Position	Study level	Years of academic labor	Wage Grid for teaching didactic personnel – May, 2021					
				Base wage - lei					
				Gradation					
				0	1	2	3	4	5
		S	>25 years	6,561	7,053	7,406	7,776	7,971	8,170
		S	20-25 years	5,956	6,403	6,723	7,059	7,236	7,415
		S	15-20 years	5,338	5,738	6,025	6,325	6,483	6,631
		S	10-15 years	4,973	5,346	5,614	5,895	6,029	6,166
		S	5-10 years	4,620	4,966	5,215	5,476	5,599	5,726
		S	3-5 years	4,485	4,821	5,035	5,261	5,379	5,499

d.) Calendar of the job application contest

- The Application period will run 45 days after the Announcement publication date in the Romanian Official Monitor, May 6th 2021 to June 19th 2021
- The contest takes place in no more than 15 days after the application period. from July 6th 2021 to July 16th 2021.

- The Higher Education Institution announces on its website the contest date, time and place at least **5 working days** before the test
- The period for solving the appeals is: July 20th – 23rd July 2021

e). Detailed syllabus and tutorial

- **Numerical and experimental techniques for investigating naval propulsion systems;**

No.	Content
1.	**1. General notions regarding the measurement technique** 1.1. Measurement operation 1.2. Measurement systems 1.3. Measurement methods 1.4. Experimental data processing
2.	**2. Methods for investigating turbulent flows in the internal combustion engine:** 2.1. Measurement of local pressure and speed with the pressure tube 2.2. Flowmeters 2.2. Hot wire anemometry 2.3. Spark anemometry 2.4. The vane anemometer 2.5. Doppler Laser Anemometry (LDA) 2.6. PIV Techniques (Particle Image Velocimetry 2.7. Phase-Doppler Anemometry (PDA) 2.8. Laser Induced Fluorescence (LIF) Techniques
3.	**3. Methods for measuring mechanical and thermal pressures and stresses:** 3.1. Pressure transducers with piezoelectric crystals 3.2. Board translators with tensometric stamps 3.3. Tension measurement using tensometric stamps 3.4. Cylinder pressure measurement techniques
4.	**4. Temperature measurement methods:** 4.1. Temperature measurement with thermoresistors; 4.2. Temperature measurement with thermocouples. 4.3. Temperature measurement with thermal transistors; 4.4. Temperature measurement with pyrometers and thermal imaging cameras.
5.	**5. Methods of measuring concentrations in the gas mixture** 5.1. Methods of measuring the concentration of O; 5.2. Methods of measuring CO concentration; 5.3. Methods of measuring the concentration of CO2 5.4. Methods for measuring the concentration of unburned hydrocarbons; 5.5. Methods for measuring smoke/particle emissions; 5.6. Spectral methods.
6.	**6. Numerical integration techniques** 6.1. Discretization methods

No.	Content
	6.2. Numerical integration of flow equations with the finite difference method 6.3. Numerical integration of flow equations with the finite volume method 6.4 Numerical integration of flow equations with the finite element method
7.	**7. Software solutions used** 7.1. Matlab MathWorks development environment 7.2. Ansys - Mechanical –Structural / Thermal 7.3. Ansys - Ansys IE Engine (Strong / Fluent)

References

No.	Title
1.	Apostolescu, N., Taraza, D., Bazele cercetării experimentale a maşinilor termice, Editura Didacticã şi Petagogicã, 1979.
2.	S.D.P. Hoult, V.W.Wong, The generation of turbulence in an internal – combustion engine, Combustion modeling in reciprocating engines,Plenum Press, New York, 1980.
3.	Pop, E., Stoica, V., Principii şi metode de măsurare numericã, Editura Facla, 1997.
4.	Vasilescu, Al., Analiza dimensionalã şi Teoria similitudinii, EA, 1969.
5.	Catalog and documentation Anstalt für Verbrennungskraftmaschinen List (AVL)
6.	Catalog and documentation Armfield, Enginnering teaching research equipment.
7.	Catalog and documentation National Instruments, Instrumention reference and catalogue, Test and measurement
8.	Catalog and documentation Krister Group Measurement technology for maritime and naval applications
9.	Documentation Matlab MathWorsk 7.9
10.	Documentation Ansys Mechanical 19.2.
11.	Documentation Ansys – IC Engine /Fluent
12.	Documentation Ansys Forte 19.2

- **Automation of naval propulsion systems;**

No.	Content
1.	1. Introductory notions on the automation and control of processes and installations on board ships 1.1. General considerations: 1.1.1. Principles of mechanical automation 1.1.2. Principles of pneumatic automation; 1.1.3 Principles of hydraulic automation; 1.1.4 Principles of electrical automation;

No.	Content
	1.1.5 Principles of electronic automation; 1.1.6 Principles of combined automation 1.2. Functions of automatic systems 1.3.Characteristics of automation devices 1.4 Principles for measuring the various specific parameters: 1.4.1.Measurement of temperature. 1.4.2 Pressure measurement. 1.4.3 Level measurement. 1.4.4 Flow measurement. 1.4.5 Speed measurement. 1.4.6 Detectors, 1.4.7 Measurement of other specific quantities. 1.5 Signal transmission. 1.5.1 Mechanics; 1.5.2 Hydraulics; 1.5.3. Electric; 1.5.4 Combined 1.6 Automation elements used 1.6.1 Distributors: 1.6.1.1 Directly commanded: •Mechanic; • Electric 1.6.1.2 Servo controls • Hydraulic; • Pneumatic 1.6.2 Regulatory systems (P, PI, PID): 1.6.2.1 Tires; 1.6.2.2 Hydraulics; 1.6.2.3 Electrical • Wheatstone bridge; • inductive; • capacitive 1.6.3 Speed regulators 1.6.3.1 Mechanical regulator 1.6.3.2. Servo-assisted mechanical regulators 1.7 Execution elements: 1.7.1 Servomotors: • Hydraulics; • Tires; • Electrical • Step by step. 1.7.2 Positioning systems
2.	**2. Organization of posts and surveillance systems on board** 2.1. Arrangement of command stations on board and their evolution. 2.2 Surveillance systems (alarm and automation) on board ships and their evolution 2.3 Automation systems of main naval engines 2.4 Power plant automation systems.

No.	Content
	2.5 Automation systems of auxiliary equipment.

References

No.	Title
1.	Turcoiu, T., Pruiu, A., Comanda supravegherea şi protecţia motorului naval, I.S.B.N. 973-31-0922-3, Editura Tehnică, Bucureşti 1996.
2.	Buzbuchi, N., Sabău, A., Motoare diesel navale. Procese, caracteristici, exploatare, ISBN 973-88143-77-2, Editura Bren 2004, Bucureşti,
3.	Jackson, L and Morton, T.D. General Engineering Knowledge for Marine Engineers. 5th ed. London, Thomas Reed Publications Ltd 1990. (ISBN 09-47-63776-1)
4.	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1995 (IMO Sales No. 938), and 1997 Amendments to STCW 95 (IMO Sales No. 945)
5.	Documentation of the Kongsberg (NorControl) Simulator: Engine Room Simulator - Instructor Manual

- **Operation, repair and maintenance of internal combustion engines.**

No.	Content
1.	**1. Reliability of marine engines** 1.1. General reliability issues. 1.2. Steps to achieve the reliability. 1.3. Reliability functions and their mathematical expressions. 1.4. Variation in the reliability of a marine engine according to its service life. 1.5. Calculation of the reliability of the marine engine by the Weibull method and tracking the reliability in operation. 1.6. Simultaneous action of accidental and wear defects in the study of marine equipment reliability.
2.	**2. Diagnosis of the technical condition** 2.1. General principles for diagnosing internal combustion engines: general information on the wear of internal combustion engines; general considerations regarding the repair of internal combustion engines. 2.2. Principles of diagnosing the technical condition of internal combustion engines and their repair 2.2.1 Checking the technical condition without disassembling the engine; assessment of the technical condition after oil analysis; assessment of the technical condition based on the analysis of the exhaust gases; assessment of the technical condition by pneumatic means; assessment of technical condition after noise and vibration. 2.2.2. Checking the technical condition after disassembly: sorting

	parts, checking for hidden defects; control of surface wear and defects; tree control; control of cylinder liners; control of gears with gears; rolling bearing control; spring control; methods for restoring combustion engine adjustments.
3.	**3. Preparation, operation, fault detection and measures to prevent damage to engines and installations** 3.1. Operation of engines and auxiliary installations 3.1.1. Preparation of stationary naval engines. 3.1.2. Keep diesel engine systems ready for start-up. 3.1.3. Operation of the naval engine and its starting. 3.1.3.1. Normal engine preparation for starting 3.1.3.2. Operation of the lubrication system and the oil separator 3.1.3.3. Cooling system operation 3.1.3.4. Operation of the fuel system and fuel separator 3.1.3.5. Operation of separation and filtration systems: centrifugal oil and fuel separators and related filtration systems. 3.1.3.6. Operation of the compressed air starting system 3.1.3.7. Axial line preparation 3.1.3.8. Quick engine preparation 3.1.3.9. Starting the diesel engine 3.1.3.10. Starting the engine with compressed air 3.1.3.11. Starting the marin diesel engine with an electric starter 3.1.3.12. Reversing the direction of rotation of the engine 3.2. Operation of the engine and auxiliary installations in operation and in maneuver 3.2.1. Engine running 3.2.2. Operating the engine while maneuvering and in special situations.
4.	**4. Safety measures to be taken for repair and maintenance, including the safe insulation of machinery and equipment required on board the ship before personnel are authorized to work with such equipment or mechanisms** 4.1. ISM (International Safety Management) Code. 4.2. SMS (Safety Management System). 4.3 Safety measures to be taken when performing maintenance and repair operations
5.	**5. Prevention of pollution of the marine environment** 5.1. Measures to reduce pollution of the marine environment MARPOL 73/78 5.2. Anti - pollution procedures and associated equipment. 5.3. The importance of proactive measures to protect the marine environment

References

No.	Title
1.	Buzbuchi, N., Sabău, A., Motoare diesel navale. Procese, caracteristici, exploatare, ISBN 973-88143-77-2, Editura Bren, Bucureşti,
2.	Uzunov, G., Dragomir, I., Pascale, D., Îndrumătorul ofiţerului de navă, Editura Tehnica, Bucureşti, 1983.
3.	International safety guide for oil tankers and terminals. 5th edn. Ics/ocimf. London, witherby & co. Ltd 2006 (ISBN 978-1856-092-913)
4.	Jackson, L and Morton, T.D. General Engineering Knowledge for Marine Engineers.5th ed. London, Thomas Reed Publications Ltd 1990. (ISBN 09-47-63776-1)
5.	Taylor, D.A. Introduction to Marine Engineering. 2nd ed. London, Butterworth. 1990 (ISBN 07-50-6253-9).
6.	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1995 (IMO Sales No. 938), and 1997 Amendments to STCW 95 (IMO Sales No. 945)
7.	Marine engine technical documentation, MAN&BW, SLUZER, WARSILA
8.	MARPOL 73/78 14 Technical Annexes: Annex I to VI*** International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1995 (IMO Sales No. 938), and 1997 Amendments to STCW 95 (IMO Sales No. 945)
9.	Documentation for the Kongsberg (NorControl) Simulator: Engine Room Simulator - Instructor Manual

f.) Job Application Contest Procedures

In order to enter the competition for a teaching and research position, the candidate prepares a dossier containing at least the following documents:

a) Application form, signed by the candidate, including an affidavit about the veracity of the information presented in the file;

b Proposal to develop the candidate's academic career in terms of teaching, in case of teaching positions and also in terms of scientific research; the proposal shall be made by the candidate, it includes more than 10 pages and is one of the main criteria of selecting candidates.

c) Curriculum vitae of the candidate, printed and electronically

d) List of candidate's works, printed and electronically;

e) A sheet verifying the fulfillment of university standards of presentation in the competition, whose standard format is required by its own methodology. The verified sheet is completed and signed by the candidate;

f) Documents which relate to the degree of doctor: copy of the diploma of doctor and, if the original doctor's degree is not recognized in Romania, certificate of recognition or equivalence thereof;

g) Summary of the thesis in Romanian and a foreign language, or, where applicable, habilitation thesis on no more than one page for each language;

h) The candidate's affidavit indicating incompatibility situations stipulated by Law no. 1/2011 as they are for winning the competition or lack of such situations of incompatibility;

i) Copies of other diplomas demonstrating the candidate's studies
j) Copy of identity card or, if the candidate does not have an identity card, passport or other identity document issued in an equivalent identity purpose;
k) If the candidate has changed his name, copies of documents certifying the name change - marriage certificate or proof of name change;
l) Maximum 10 publications, patents and other papers of the candidate, in electronic format, selected by him and considered to be most relevant for their professional achievements.

Curriculum vitae of the candidate must include:
a) information about the studies and diplomas obtained;
b) information on professional experience and relevant jobs;
c) information about research and development projects which he led as project manager and grants obtained, if there are such projects or grants, indicating for each funding source, funding amount and the main resulting publications and patents;
d) information about the awards or other recognition of scientific contributions of the candidate.

Full list of papers of the candidate will be as follows:
a) List of more than 10 papers of the candidate to be most relevant for his professional achievements, which are included in the electronical file and can be found in other types of works under this article. For the post of professor, works list will specify which of the papers presented are carried out after obtaining the certificate of entitlement;
b) The doctoral thesis or theses;
c) Patents and other industrial property titles;
d) Books and chapters in books;
e) Articles/studies extensively published in international scientific journals in the main stream;
f) In extenso publication, the main works published in international specialized conferences;
g) other works and scientific contributions, as appropriate, in the field of artistic creation.
Candidate's professional competence is assessed by the competition commission based on the record of the competition and, additionally, by one or more samples of the competition, including lectures, courses or other similar support under this methodology:

a) for all posts for indefinite period, a test is represented by a public lecture at least 45 minutes in which the candidate has the most significant previous professional and academic career development plan.
b) The Higher Education Institution announces on its website the contest date, time and place at least 5 working days before the test.

Stages of the contest:

Stage I - the assessment of the candidate's application file (evaluation of the documents in accordance with Methodology for occupying vacant didactic and research positions.

Stage II - In the public lecture, the candidate has to deliver in at least 45 minutes, before the competition commission and the department members, his/her most significant professional results as well as plans for the development of his /her

academic/scientific career. This test must also contain a question and answer session from the committee and the public.

Stage III - Taking a practical test to verify the knowledge of the use of the Kongsberg (NorControl) Simulator: Engine Room Simulator.

1. Carrying out a simulation exercise at the choice of the commission, from the existing predefined ones;
2. Carrying out an evaluation on the simulator for the chosen exercise.

Stage IV - Taking an oral test with topics chosen from the theme of the contest.

g.) The candidate file must contain at least the following documents:

a) Application form, signed by the candidate, including an affidavit about the veracity of the information presented in the file;

b Proposal to develop the candidate's academic career in terms of teaching, in case of teaching positions and also in terms of scientific research; the proposal shall be made by the candidate, it includes more than 10 pages and is one of the main criteria of selecting candidates.

c) Curriculum vitae of the candidate, printed and electronically

d) List of candidate's works, printed and electronically;

e) A sheet verifying the fulfillment of university standards of presentation in the competition, whose standard format is required by its own methodology. The verified sheet is completed and signed by the candidate;

f) Documents which relate to the degree of doctor: copy of the diploma of doctor and, if the original doctor's degree is not recognized in Romania, certificate of recognition or equivalence thereof;

g) Summary of the thesis in Romanian and a foreign language, or, where applicable, habilitation thesis on no more than one page for each language;

h) The candidate's affidavit indicating incompatibility situations stipulated by Law no. 1/2011 as they are for winning the competition or lack of such situations of incompatibility;

i) Copies of other diplomas demonstrating the candidate's studies

j) Copy of identity card or, if the candidate does not have an identity card, passport or other identity document issued in an equivalent identity purpose;

k) If the candidate has changed his name, copies of documents certifying the name change - marriage certificate or proof of name change;

l) Maximum 10 publications, patents and other papers of the candidate, in electronic format, selected by him and considered to be most relevant for their professional achievements.

h.) The application for the competition will be submitted to the address enclosed in the header.

DEAN:
Assoc. Pro[redacted]stantin STAN, PhD

HEAD OF DEPARTAMENT:
Lecture Adrian SABĂU, PhD
[redacted]