

Summary report on research accreditation

I. General information

Name of organization	Tiraspol State University
Organization type (to underline)	Research institute <u>Institution of Higher Education</u> Ministerial research institute.
Research mission of organization	Research mission of Tiraspol State University is: <ul style="list-style-type: none"> - to organize and to perform fundamental and applied scientific research prioritized by national economy; - to popularize and implement the results of scientific research and advanced technologies in order to find more effective ways to cope with the problems encountered by education, science, culture, etc.; - to provide technical, scientific, methodical and consultative help to ministries, departments, economic agents, individuals, etc.; - to participate in the elaboration of training innovations and contribute to their further implementation according to the Bologna process requirements; to constructively direct these efforts towards reaching the European standards of higher education.
Strategic research direction (s)	1. Consolidation of the State of Law and the use of cultural heritage in the perspective of integration into multicultural and multinational Europe. 2. Economic basis of sustainable development and efficient use of human and natural resources. 5. Nanotechnology, new materials and information technology.
Evaluated period	2007-2011
Web of organization	www.ust.md

II. Research capacity (annual average for evaluated period)

Total posts occupied by researches	56,9 (For three accredited profiles)							
Number of scientific researches	113,2							
Number of researches who possess honorific titles, scientific degrees, scientific and scientific-didactical titles	ASM full members	ASM corresp. members	Professor	Associated Professor	Dr.hab.	Dr. (PhD)		
	1	-	12,4	58	12,2	68,2		
Number of researches involved in international projects	FP 7		STCU		Bilateral		Others	
	-		-		1,2		3	
Number of young researches (under 35 years old)	Dr (PhD)		PhD students			Others		
	12,2		7			6		

Financial resources (thousand MDL)	Public budget 2191,6	International projects/grants 174,9	Research contracts -
Distribution of expenditures (thousand MDL)	Salary 939,7	Infrastructure development 307,1	Other 1092,7
Expenditures for infrastructure development (thousand MDL)	Equipments 41,1	IT infrastructure 266,0	
List of 3 basic research methods, installations, technologies (per accredited field)	Bio-morphological and immunological description; Intra-and interspecific hybridization; Morphometric, paleontological, paleo-bio-stratigraphical; palynology, paleoecology; Modified method of melting zone in the external electric field Topological methods, algebraic, functional; Geometrical and modelling method; Observation; Pedagogical Experiment; Test.		
List of provided scientific services	Teacher training courses: biology, geography, mathematics, physics, informatics, chemistry, preschool and primary education		
List of editorial activities	With contribution of the university staff, the following scientific editions are printed: -Materials of international scientific conferences 2008, 2010 (2 volumes). -Materials of Student scientific conferences, 2007, 2010. -Materials of young researchers' scientific conference, 2008. - Materials of national scientific conferences, 2010 (2 volumes).		

III. Distribution of number of research projects and themes during the evaluated period.

Institutional projects	2007 5	2008 5	2009 5	2010 5	2011 7
Projects in the frame of State Programmes	2007 -	2008 -	2009 -	2010 1	2011 1
Technological transfer projects	2007 -	2008 -	2009 -	2010 -	2011 -
Projects for equipment procurement	2007 -	2008 -	2009 -	2010 -	2011 -
Projects for young researches	2007 1	2008 1	2009	2010 1	2011 1
Projects in the frame of	2007	2008	2009 1	2010 1	2011

bilateral programmes					
International projects/grants	2007 1	2008	2009 2	2010 3	2011 2
List of 3 representative international projects/grants	<ul style="list-style-type: none"> • Moldovan-Russian bilateral international project 09.820.07.04/UF Promoting effective intercultural communication: overcoming stereotypes and prototypes in the Russian and Moldovan interaction of cultures, project coordinator Olga Gherlovan. Duration of the project: 2009 – 2010. • Project number -511322- TEMPUS-1-2010-1-SE-TEMOUS-JUCR Geographic information technology for sustainable development in Eastern neighbouring countries (GIDEC), project coordinator Vitalii Dilan. Duration of the project: 2010-2013. • Project number: 145035-TEMPUS-2008-LT-JPTHN: Western-Eastern Teacher Education Network (WETEN), project coordinator Andrei Braicov. Duration of the project: 2009-2011. 				
Research contracts	2007 -	2008 -	2009 -	2010 -	2011 -
List of 3 representative research contracts					

IV. Scientific publications

Total number of publications abroad	Books 2	Chapters in books 3	Journal papers 56
Total number of publications in ISI journals and books	Books -	Chapters in books	Journal papers 18
Total number of publications in the country	Books 27	Chapters in books 10	Journal papers 219
Total number of conference abstracts	International abroad 28	International in the country 101	National 153
List of 5 representative publications (per accredited field)	<p>Regional study on geographical and biological systems</p> <ol style="list-style-type: none"> 1. Cozari T., Usafii M., Vladimirov M. The animal world of Moldova. Vol. 2. Fishes. Amphibians. Reptiles. Chişinău, „Ştiinţa” Publishing House 2007. 150 p. (<i>in Romanian</i>) 2. Ciubotaru A., Postolache G., Teleuță A., Grati V. et al. The vegetal world of Moldova. Plants with flowers III. Chişinău. Ştiinţa. 2007. 184 p. (<i>in Romanian</i>) 3. Cazac V., Boian I., Volontir Nina. Natural Hazards. The geographic environment of the Republic of Moldova. „Ştiinţa” Publishing House, Chişinău, 2008. 207 p. (<i>in Romanian</i>) 4. Cozari T. Reproductive strategies of amphibians: Etologic and ecologic evolutionary peculiarities in antropyzate and natural ecosystems. Chişinău. Ştiinţa. 2009, 288 p. (<i>in Romanian</i>) 5. Lungu Al., Rzebik-Kowalska B. Faunal assemblages, stratigraphy 		

	<p>and taphonomy of the Late Miocene localities in the Republic of Moldova. Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Kracow, 2011, 64 p.</p> <p style="text-align: center;">Concepts and strategies of modernizing the educational process</p> <ol style="list-style-type: none"> 1. Patraşcu D., Gaştea R., Phantasm of Mentality, History, Sociology, Psychology, Pedagogy, Andragogy and management. Chişinău, 2011. ISBN 978-9975-53-009-5. 382 p. (<i>in Romanian</i>) 2. Stah D. Social and cultural aspects of 18th Century Britain, Chişinău, A.S.M. Typography, 2007, 88-p. ISBN 978-9975-62-208-0. 3. Botnaru T. Mythical and folk significances and visions in contemporary poetry (1960-1980). Monograph. Chişinău: Reclama Typography, 2011, 200 p., ISBN 978-9975-105-50-7. (<i>in Romanian</i>) 4. Lupu I., Cioban-Pileţcaia A., Monograph. Motivating mathematics learning. UST 2007, 126 p. (<i>in Russian</i>) 5. Cojocaru V. Theory and methodology of innovational transfer in higher education. Chişinău: Pontos Publishing House, 2010, 265p. ISSN 978-9975-51-136-0 (<i>in Romanian</i>) <p style="text-align: center;">Current problems of mathematic and physico-chemical sciences</p> <ol style="list-style-type: none"> 1. Arhangel'skii, A.V.; Choban, M.M., Some generalizations of the concept of the p-space. <i>Topology and its Applications</i>. 2011, 158, 1381-1389. ISSN: 0166-8641. (IF: 0.52). 2. Arhangel'skii, A.V.; Choban, M.M.; Kenderov, P.S., Topological games and continuity of group operations. <i>Topology and its Applications</i>. 2010, 157, 2542-2552. ISSN: 0166-8641. (IF: 0.52). 3. Cozma D., The problem of the centre for cubic systems with two parallel invariant straight lines and one invariant cubic. <i>Nonlinear Differential Equations and Applications</i> 16 (2009), no. 2, 213-234. ISSN: 1021-9722. (IF: 0.77). 4. Choban M.M., Reduction principles in the theory of selections. <i>Topology and its Applications</i> 155 (2008), 787-796. ISSN: 0166-8641. (IF: 0.52). 5. Georgetse A., Ivanov-Omski V., Munteanu F., Caraman M., Postolachi I., Specific Features in the Energy Spectrum of the Narrow-Gap Semiconductors Bicristals $Bi_{1-x}Sb_x$ ($0,06 \leq x \leq 0,20$). <i>Semiconductors</i>, Vol. 47, Nr. 10, p. 1178-1180. ISSN: 1063-7826. (IF: 0,562).
List of 5 citations	<p>Arhangel'skii A.V., Choban M.M. <i>Remainders of rectifiable spaces</i>. <i>Topology and its Applications</i>, 157 (4), 2010, 789-799. (4 citations in SCOPUS data base)</p> <p>Subă, A. and Cozma, D., Solution of the problem of the centre for cubic differential system with invariant straight lines two of which are parallel, In: Yu. L. Bondar' and A. P. Sadovskii, On a Zoladek Theorem, <i>Differential Equations</i>, 2008, Vol. 44, No. 2, pp. 274–277.</p> <p>Cozma D. and Suba A., Partial integrals and the first focal value in the problem of centre. In: J. Gine, On some open problems in planar differential systems and Hilbert's 16th problem, <i>Chaos, Solutions and</i></p>

	<p>Fractals 31 (2007), 1118–1134.</p> <p>Volontir N. Methodological aspects concerning geomorphological investigations in the local horizon with pupils. In: DULAMĂ, M. Forming pupils' competencies by studying home locality- theory and applications. CLUSIUM Publishing House. 2010. p. 406. ISBN 978-973-595-220-4 (<i>in Romanian</i>)</p> <p>Mîslîţchi V., Botnari V. Forming verbal competencies to children: the use of noun forms. Reference in Studia Universitatis, Sciences of Education Series , Nr. 9(29), 2009 (<i>in Romanian</i>)</p>
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V. Innovation outputs

Total number of patents	Registered in the country	Registered abroad	Implemented -
Total number of new developed methods and technologies	Registered	Non-registered	Implemented -
Total number of new scientific products	Registered	Non-registered	Implemented -
Total number of scientific outputs for central and local authorities (draft of law, strategies etc.)	9		
Total number of scientific outputs for educational institutions	Handbooks for high education 92	Handbooks for pre-university institutions 51	Delivered university courses 122
List of 5 representative innovation outputs (per accredited field)	<p>Regional study on geographical and biological systems</p> <p>1. Patent no. 38 MD // BOPI 2009, No. 3. For plant variety Elvira - tomato (<i>Lycopersicon esculentum</i> Mill). Authors: Grati M., Mihnea N., Grati V., Jacota A.</p> <p>2. Plant variety patent no. 36 MD // BOPI 2009 No.2. For plant variety Katerina - tomato (<i>Lycopersicon esculentum</i> Mill). Authors: Grati M., Uraleş L., Grati V.,</p>	<p>Concepts and strategies of modernizing the educational process</p> <p>1. Professional aims derived from the key competencies proposed by European bodies for different categories of teaching staff in accordance with the higher education levels</p> <p>2. Basic curricular principles for training specialists in the field of mathematics and psychopedagogic preuniversity education.</p> <p>3. There were</p>	<p>Current problems of mathematic and physico-chemical sciences</p> <p>1. Patent no. MD 3943 BOPI 2009, No.7. Nutrient medium for cultivation of <i>Aspergillus niger</i> 33-19 CNMN FD 02 fungi strain. Authors: Deseatnic A., Stratan M., Coropceanu E. et al.</p> <p>2. Patent no. MD 3945. Nutritive medias for increasing the amilolytic activity of some fungal strains. Authors: Deseatnic A.,</p>

	<p>Jacota A. 3. Plant variety patent no. 35 MD // BOPI 2009 No.2. For plant variety Santa Maria - tomato (<i>Lycopersicon esculentum</i> Mill). Authors: Grati M, Uralet L., Andiuşcenco V., Chislean N., Niutin Iu., Grati V.</p> <p>4. Plant variety patent no. 39 MD // BOPI 2009 No.3. For plant variety Mihaela - tomato (<i>Lycopersicon esculentum</i> Mill). Authors: Mihnea N., Grati M., Chireeva G., Jacota A., Grati V.</p> <p>5. Plant variety patent no. 43 MD // BOPI 2009 No.5. For plant variety Cranberries - tomato (<i>Lycopersicon esculentum</i> Mill). Authors: L. Moldovanu, Grati M, Grati V., Mihnea N.</p>	<p>substantiated different ways of capitalizing the strategies of forming professional competencies to future teachers of various specialization profiles.</p> <p>4. Models of interconnection of innovative transfer components with the policies of higher education renovation and assessment of the general tendencies concerning the innovational transfer on the national and international levels.</p>	<p>Stratan M., Tiurin J., Bologna O., Clapco S., Coropceanu E. et al.</p>
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VI. Major scientific and innovation achievements

<p>Short description of main scientific results and its confirmation (by awards, citations, development of international projects etc.)</p>	<p style="text-align: center;">Regional study on geographical and biological systems</p> <ul style="list-style-type: none"> - Cenomanian common Ammonite areas on Moldavian Platform and Paleobiogeographic Province of Middle Europe highlight allowed the biostratigraphic correlation of deposits with ammonites scrap. It was analyzed the ammonites biohorologia and phroresis from cenomanian sea basins and their lifestyle (benthic carbonate-sandy substrate). - Synoptic conditions analysis of droughts, saturation deficit, fog and ice manifestation; determining vulnerability areas to these phenomena; frequency, probability, time trend and spatial modeling are of great interest in theoretic climatology. Morphometric characteristics modifications of the basin Raut during the XX-th century generate the formation of a number of low order rivers and ponds and therefore increase fragmentation lineage on interfluves and slopes. In agroclimatology, thermal and rainfall fields modeling, agroclimatic potential assessment and agroclimatic zoning of the hill plain of Balti have an important theoretical value. There were developed digital maps of territory vulnerability to weather-related risk (drought, saturation deficit, fog, ice), the numerical model of
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	<p>Moldova at scale 1:100000 on which there were represented hydrography, forests, urban and rural areas, hydrothermal constructions, soil types; there were modeled flood waves of different insurance of the Nistru and Prut rivers.</p> <p style="text-align: center;">Current problems of mathematic and physico-chemical sciences</p> <p>- <i>Addressing continuity of algebraic operations in topology groups.</i> This problem was formulated by D. Montgomery in 1936. The proposed solution is based on a new concept that allows describing fundamental properties of a class of spaces called fan-complete spaces. This concept allowed: to get a result for the case of paratopological groups: if the paratopological group contains a complete-fan dense subspace, then it is a topological group. Compared with previously proposed results and methods of studying this problem, newly developed methods are more effective and simple for applications.</p> <ul style="list-style-type: none"> • <i>Solving the problem of distinguishing outbreak center in the differential cubic system.</i> It solves the problem of centered sequences for the differential cubic system with a weak outbreak O (0,0) equilibrium point. It determines the conditions for the existence of two invariant straight lines and of a tapered invariant. These algebraic solutions demonstrate: <ul style="list-style-type: none"> - singular point cyclicity is not greater than four; - the cubic system with two invariant lines and a conic invariant is Darboux integrable. These results are new and have been published in impact factor journals. • <i>The structure of reflectance spectra of iron doped gallium antimonite.</i> The present work exposes the reflection spectra structure modification of iron doped gallium antimonite in high atomic concentrations (0.005 ÷ 3)% at a temperature of 300K. The samples studied in this work were obtained by means of modified zone melting method. Reflection spectra were increased using the SPICORD spectrophotometer installation. 				
Number of organizations, invited speakers at international conferences	14	6	20	20	17
Short description of technological transfer and innovation results and its certification by implementation.	<p style="text-align: center;">Regional study on geographical and biological systems</p> <p>In collaboration with the Institute of Genetics and Plant Physiology of the Academy of Sciences of Moldova there were underlined some technological elements that can increase the productivity of <i>SANTA MARIA, KATERINA, MIHAELA, ELVIRA</i> tomato varieties . It was carried out the hybridization and evaluation of varieties according to their reaction to thermal and hydric stress factors.</p> <p style="text-align: center;">Concepts and strategies of modernizing the educational process</p> <p>There were worked out professional aims derived from the key competencies proposed by European bodies for different categories of teaching staff, in accordance with the higher education levels: Ist cycle- Licence degree, IInd cycle – Master’s degree, IIIrd cycle- Ph.D degree. There were formulated the basic curricular principles for training specialists in the</p>				

	<p>field of mathematics and psychopedagogic preuniversity education. There were substantiated different ways of capitalizing the strategies of forming professional competencies to future teachers of various specialization profiles. It was modeled the interconnection of innovative transfer components with the policies of higher education renovation and the general tendencies concerning the innovational transfer on the national and international levels.</p> <p style="text-align: center;">Current problems of mathematic and physico-chemical sciences</p> <p>The employers of the Tiraspol State University Patent took part to the elaboration of nutrient medium for cultivation of <i>Aspergillus niger</i> 33-19 CNMN FD 02 fungi strain (Patent no. MD 3943, BOPI 2009, No.7. Authors: Deseatnic A., Stratan M., Coropceanu E. et al.). The invention refers to biotechnology, particularly to a nutrient medium for cultivation of <i>Aspergillus niger</i> 33-19 CNMN FD 02 fungi strain and can be used in microbiological industry for obtaining amylolytic enzymes.</p> <p>Also, there were patented the nutritive medias for increasing the amilolytic activity of some fungal strains (Patent no. MD 3945. Authors: Deseatnic A., Stratan M., Tiurin J., Bologna O., Clapco S., Coropceanu E. et al). The invention solves the problem of obtaining of microbial amylases in high quantity. By introduction in the nutritive media of coordinative compounds of Co (III) with dimethylglyoxime and fluorine anions $[\text{TiF}_6]^{2-}$ or $[\text{BF}_4]^-$ in quality of biostimulators and stabilizers of the biosynthetical capacity of producers, the purpose is realized. Technical results of invention consist in increasing of amylolytic enzymes biosynthesis with 27,8%-46,63% of <i>Aspergillus niger</i> 33 CNMN FD 06A, <i>Aspergillus niger</i> 33-19 CNMN FD 02A strains - amylases producers and reduction of cultivation cycle of producer with 24-48 h.</p> <p>The investigations were performed in collaboration with research institutes of the Academy of Sciences of Moldova- the Institute of Microbiology and Biotechnology and the Institute of Chemistry.</p> <p>The elaborations were demonstrated at the "EUROINVENT 2010", Iasi, Romania, 2010, and the International Salon of inventions and new technologies «New time", Sevastopol, Ukraine, 2011 and appreciated with gold medals.</p>				
Number of defended dr.hab. and dr. theses per year	1/6	0/5	0/4	2/10	1/4

VII. Present/further involvement in the Seventh Framework Programme (FP7): specific programmes (Cooperation, Ideas, People, Capacities) of interest and its sub-divisions.

Currently, the University is carrying out investigations in the frame of the project FP-7 FP-PEOPLE- 2012- IRSES: Dynamical systems and their applications (DynSysAppl) nr.316338.- 2012-1016, project coordinator Cozma Dumitru.

VIII. Accredited research field and its evaluation by the National Council for Accreditation and Attestation of the Republic of Moldova (very good/good/satisfactory)

- Regional study on geographical and biological systems – **good**
- Concepts and strategies of modernizing the educational process – **satisfactory**
- Current problems of mathematical and physico-chemical sciences - **good**

IX. Category (A/B/C) attributed by the National Council for Accreditation and Attestation of the Republic of Moldova to the organization – Category B

X. Institutional development actions planned for the next 5 years (maximum ½ pages).

Actions related to the institutional development for the next five years include:

- promoting international projects; development of informational technologies;
- permanent updating the web page of MS;
- development of the innovative infrastructure and promoting technology transfer projects;
- development of the technical endowment for research;
- completing the university library with modern scientific literature;
- strengthening connections between research & economy;
- increasing the number of publications in journals with ISI impact factor;
- increasing the number of contracts with local and foreign businesses;
- engagement of young people in research, development and innovation activities;
- increasing the level of young people education through PhD and post PhD studies;
- membership confounding at profile scientific journals;
- implication of foreign and national scientists as scientific advisors and consultants in the process of training highly qualified specialists;
- organizing internships for young researchers abroad lasting more than 30 days;
- expanding scientific services rendered to pre-university education units etc., institutions.

Rector

L.Calmutchi, professor