SUMMARY REPORT OF THE EXTERNAL EVALUATION

of the cluster of educational programmes in

- "Electronics Engineering and Technology" (211000.62, 211000.68)
- "Electronics and Nanoelectronics" (210100.62, 210100.68),

delivered by Federal State Autonomous Educational Institution of Higher Professional Education "National Research University "MIET"

2014

While preparing this Summary Report we used information from the Self-Evaluation Report and the Report on the External Review of the cluster of educational programmes in "Electronics Engineering and Technology" (211000.62, 211000.68), "Electronics and Nanoelectronics" (210100.62, 210100.68), delivered by National Research University "MIET".

The presentation document for the use by the National Accreditation Board.

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GENERAL INFORMATION ON EDUCATIONAL INSTITUTION

Full name of the educational institution	*Federal State Autonomous Educational Institution of Higher Professional Education "National Research University "MIET"*
Founders	*Ministry of Education and Science of the Russian Federation*
Year of foundation	*1965 – Moscow Institute of Electronic Engineering* *2010 – National Research University "MIET"*

Current state accreditation status:

Type	*Educational Institution of Higher Professional Education*
Kind	*National Research University*
Location	*124498, Moscow, Zelenograd, passage 4806, 5*
Rector	*Chaplygin Yuri, D.Sc., corresponding member of RAS, professor*
License	*Series 90LO1 No. 0000723 reg. No. 0677 of 26.03.2013; permanent*
State Accreditation	*Certificate of State Accreditation Series 90A01 No. 0000782, reg. No. 0724 of 14.06.2013, valid till 24.03.2016 (reissuance)*
Number of students	*4635*

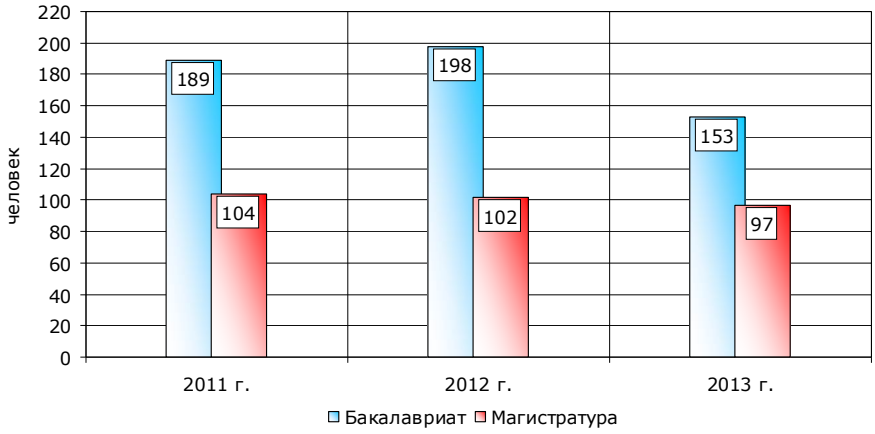
INFORMATION ON THE EDUCATIONAL PROGRAMMES UNDERGOING ACCREDITATION

Educational programmes	*"Electronics Engineering and Technology" (211000.62, 211000.68),* *"Electronics and Nanoelectronics" (210100.62, 210100.68)*
Level of training / Standard period of training	*Bachelor's degree programme / 4 years* *Master's degree programme / 2 years*
Structural subdivisions (heads)	*Faculty of Electronics and Computer Techologies (Doctor of Technical Sciences, professor Putrya Mikhail)* *Faculty of Intellectual Technical Systems (Doctor of Technical Sciences, professor Poshin Vladimir)*
Major departments (heads of major departments)	*Department of Integrated Elecronics and Microsystems (corresponding member of RAS, Doctor of Technical Sicences, professor Chaplygin Yuri)* *Department of Microelectronics (Doctor of Technical Sciences, professor Timoshenkov Sergey)*
Date of the site visit	*February 12-14, 2014*
Person responsible for public accreditation of the study programme	*Vice Rector for Academic Affairs, Doctor of Technical Sciences, professor Ignatova Irina*

SAMPLING RESULTS OF THE PROJECT "THE BEST EDUCATIONAL PROGRAMMES OF INNOVATIVE RUSSIA"

Indicators	2013
Cluster of the educational programmes "Electronics Engineering and Technology", "Electronics and Nanoelectronics"	
Number of the given programmes in the RF	323
Number of higher educational institutions to offer the given programmes	104
Number of programmes – winners of the project (% from total amount of these programmes offered in the RF)	28 (9%)
Moscow	
Number of the given programmes offered in the region	56
Number of programmes – winners of the project (% from total amount of these programmes offered in the region)	14 (25%)
Number of higher educational institutions and subsidiaries in the region	335
Total number of programmes offered in the region	3961
Total number of programmes – winners of the project (% from total amount of these programmes offered in the region)	633 (16%)

REFERENCE DATA ON STUDENT ENROLLEMENT FOR PROGRAMMES



ACHIEVEMENTS OF THE EDUCATIONAL PROGRAMMES

Quality of the delivered educational programmes

The educational programmes undergoing accreditation are the winners of the project "Best Educational Programmes of Innovative Russia" in 2013. MIET took part in the Federal Internet Exam (FEPE) (2009-2011) and in the project "Internet Training in the Sphere of Education" (2012, 2013).

Employability of graduates

The system of sponsored training for Master's degree involves job placement and 100% employment of students before starting the Master's programme (i.e. on the 3rd and 4th courses of the Bachelor's programme).

Provision of up-to-date education

MIET carries out sponsored Master's training and retraining of specialists under agreements with leading Russian and foreign companies.

Material and technical base

Academic and scientific laboratories are equipped with modern facilities for production and control of the parameters of micro- and nanosystem devices, multimedia equipment, laboratory stands and software and hardware complexes.

Scientific activity

For the 5 years the staff of the Department of Integrated Electronics and Microsystems obtained 8 patents, awarded 4 grants, performed more than 30 research works and more than 250 articles and issued more than 20 textbooks and teaching manuals. The staff of the Department of Microelectronics obtained 16 patents, awarded 3 grants (including the President Grant), performed more than 20 research works and more than 15 design and development works, published more than 280 articles, issued 7 textbooks and teaching guides.

Academic mobility

For the last 2 years students underwent foreign internships in Roma Tre University (Italy, 2012) within student exchange programmes and in Glyndwr University (Great Britain, 2013) within the double-degree programme.

International projects

There are international educational and scientific centres which are organized in cooperation with the companies Cadence (USA) and Synopsys (USA); design centre "Mentor Graphics – MIET" and the centre for designing three-dimensional structures PTC – MIET "Parametric Technology Corporation" (PTC).

EXTERNAL REVIEW PANEL

Erich Gornik (Austria)

Review Chair, foreign expert

D.Sc., Emeritus Professor, Technical University of Vienna, President of the Austrian Society for Nano-and Microelectronics (1994-2004), President of the society "Forschung Austria" (2004 - 2008), President of the Austrian Physical Society (2009 – 2012)

A nominee of Agency for Quality Assurance and Accreditation (AQ Austria)

Elena Zima (Russia)

Deputy Review Chair, Russian expert

Candidate of Technical Sciences, assistant professor, Director of Scientific and Methodological Centre of Novosibirsk State Technical University

A nominee of the Guild of Experts in the sphere of professional education

Tadeusz Skubis (Poland)

Panel member, foreign expert

D.Sc., Professor Emeritus, Institute of Metrology, Electronic and Automatic Control of Silesian University of Technology (Gliwice, Poland)

A nominee of Polish Accreditation Committee (PKA)

Vladimir Zabavnikov (Russia)

Panel member, representative of professional community

Chief Expert at the Department of Educational Programmes of the Foundation for infrastructure and educational programmes "ROSNANO"

A nominee of the Foundation for Infrastructure and Educational Programmes ROSNANO

Alexey Streletskiy (Russia)

Panel member, representative of professional community

Candidate of Chemical Sciences, Chief Expert on research policy of the Group on analytical and expert support at the Foundation for infrastructure and educational programmes "ROSNANO"

A nominee of the Foundation for Infrastructure and Educational Programmes ROSNANO

Anastasiya Kushneruk (Russia)

Panel member, representative of students

Post-graduate student in "Solid-state Electronics, Radioelectronic Components, Micro- and Nanoelectronics" (05.27.01) at the National Research Nuclear University

A nominee of National Centre for Public Accreditation

COMPLIANCE OF THE EXTERNAL REVIEW OUTCOMES WITH THE NCPA'S STANDARDS

STANDARD 1. Policy (mission, vision) and procedures for quality assurance

Compliance with the standard: **substantial compliance**

Good practice

Administration of the university, faculties and departments as well as the teaching staff and employers are involved in defining goals of the development of the university and the educational programmes.

Development of the educational programmes undergoing accreditation corresponds to the mission and vision of MIET.

The university has developed and implemented an internal quality assurance system which involves the structural departments, teachers and partly students. A positive feature is the involvement of the employers in this process.

This system is based on an electronic corporate platform, which is easy to access and will contribute to a dynamical improvement of the teaching quality.

The methods for adjustment of the educational programmes as well as internal quality assurance system providing involvement of divisions of the HEI, teachers and students in education quality assurance procedures are in substantial compliance with the standards and criteria of National Centre for Public Accreditation.

Areas for improvement

- Practical orientation of the HEI and the educational programmes to the improvement of the regional opportunities should be more clearly defined in the strategy.
- The procedures for involvement of employers in defining the mission, goals and outcomes of the educational programmes should be formalized since the cooperation with employers is too informal. The procedures for involvement of students and postgraduates in the mentioned process should be worked out.
- The procedures for involvement of students in education quality assurance should be developed at the system level, and all the stakeholders including students should be informed of the management decisions.

STANDARD 2. Approval, monitoring and periodic review of study programmes

Compliance with the standard: **full compliance**

Good practice

Revision of the curricula and programmes of the academic disciplines is performed regularly in compliance with the goals and outcomes of the educational programmes. Learning outcomes are formulated as direct objectives taking into account the needs of industry and market trends. The contents of the disciplines correspond to modern development of electronic sensor technologies, computer and wave guide techniques, technologies of electronic circuit development and manufacturing.

Opinions of employers play a key role in determining the contents and updating the educational programmes. Changes in the programmes are initiated by the industrial partner companies, following the market trends and creating a strategic plan for technological development of the industry. MIET has agreements on long-term cooperation with foreign companies.

The HEI has developed good system for students' progress monitoring in connection with evaluation of the effectiveness of the educational programmes.

The programmes under evaluation regularly undergo state accreditation procedure. These programmes were also positively assessed by the partner university of Great Britain on the basis of the work programmes placed on the website of MIET.

Areas for improvement

- Industrial companies are rather interested in maintaining the high technological level of the current production, while the university should pay more attention to fundamental training of specialists. These two approaches should be balanced in the curricula and work programmes of the disciplines.
- The student surveys on the content of education should be conducted regularly.

STANDARD 3. Assessment of student learning outcomes / competencies

Compliance with the standard: **full compliance**

Good practice

The documents for assessment procedures at all the stages of the educational process are developed and published. The assessment criteria based on point system are clear and objective. The criteria correspond to the learning outcomes.

High qualified specialists, experienced in research and industrial manufacturing of microelectronic devices, their designing, prototyping and testing, are involved in the assessment of students' activity.

Master's degree students and postgraduates are actively involved in research conducted by the departments.

Graduates have good employment opportunities both in Russian and foreign companies. Graduates are demanded on the market, which needs high-qualified microelectronic engineers.

When students are sent abroad, MIET covers the transport and establishment costs, while the students have to cover living costs.

Areas for improvement

- Availability of the system of international mobility for students should be enhanced.
- The procedures for independent evaluation (FIPE project, etc.) should be implemented on the regular basis.
- Students' proficiency in English should be improved and language centres should be created to provide the base for language practice.

STANDARD 4. Quality assurance of teaching staff

Compliance with the standard: **substantial compliance**

Good practice

Highly qualified teaching staff (professors, Doctors of Sciences, RAS members, representatives of employers) is involved in the educational process.

Publication activity of the teaching staff (teaching materials, scientific papers in Russian and foreign journals) can be assessed as high in comparison to similar centres in this professional field.

Teachers improve their qualification in cooperation with foreign companies on a regular basis.

The university actively develops international cooperation with such famous companies as CADENCE (USA), SYNOPSIS (USA), FREE SCALE (USA), RHODE SCHWARTZ (Germany), SOLIDWORKS (USA), TECHNO CENTER (USA) in the field of integral circuits, on-chip systems, MEMS, NEMS and other semiconductor devices and sensors.

Areas for improvement

- Citation index of the university teachers in RSCI, Scopus and Web of Science should be increased.
- Management of the departments should direct its efforts to intensify the exchange of teachers with both Russian and foreign universities, especially in order to implement joint projects and internships.
- It's very important to pay more attention to teaching quality criteria in the system for monitoring and development of the staff, to organize and improve the quality assessment of teaching primarily from students. It's highly recommended to provide additional motivation for teaching staff to improve their performance.
- More opportunities for foreign languages learning (e.g. German, Chinese) should be available for postgraduates and teaching staff. It is especially important for conducting high-tech research and development of training courses which meet the latest technological requirements.

INFORMATION ON THE LEADING TEACHERS OF THE EDUCATIONAL PROGRAMMES

Chaplygin Yuri

Corresponding member of RAS, Doctor of Technical Sciences, professor, laureate of Russian President Prize in the field of education, laureate of Russian Government Prize in the field of science and technology, member of HAC Presidium, Rector of National Research University "MIET", Chair of the Department of Integrated Electronics and Microsystems, head of the scientific school in MIET, author of more than 250 scientific papers

Putrya Mikhail

Doctor of Technical Sciences, professor, laureate of Russian President Prize in the field of education, Dean of the Faculty of Electronics and Computer Technologies, Honoured worker of higher professional education of the RF, author of more than 100 scientific papers

Krupkina Tatiana

Doctor of Technical Sciences, professor, laureate of Russian President Prize in the field of education Honoured worker of higher professional education of the RF, professor of the Department of Integrated Electronics and Microsystems, author of more than 100 scientific papers

Korolev Mikhail

Doctor of Technical Sciences, professor, Honoured scientist of the RF, Honoured worker of higher professional education of the RF, Deputy Dean of the Faculty of Electronics and Computer Technologies, professor of the Department of Integrated Electronics and Microsystems, author of more than 250 scientific papers

Timoshenkov Sergey

Doctor of Technical Sciences, professor, laureate of Russian President Prize in the field of education, Chair of the Department of Microelectronics, Head of the training and scientific centre "Mentor Graphics", Head of the scientific and educational centre "Microsystem Equipment", author of more than 200 scientific papers

Shevyakov Vasily

Doctor of Technical Sciences, professor, Honoured worker of higher professional education of the RF, Deputy Dean of the Faculty of Electronics and Computer Technologies, professor of the Department of Integrated Electronics and Microsystems, author of more than 200 scientific papers

Parmenov Yuri

Candidate of Technical Sciences, professor, Honoured worker of higher professional education of the RF, Dean of the Faculty of Electronics and Computer Technologies, professor of the Department of Integrated Electronics and Microsystems, author of more than 100 scientific papers

STANDARD 5. Learning resources and student support

Compliance with the standard: **substantial compliance**

Good practice

The University has a large number of laboratories with excellent equipment and modern infrastructure. Providing full production lines is a big advantage for the education, delivered by the Departments of Integrated Electronics and Microsystems Microelectronics.

The University has full-featured electronic work space, which is used by the teaching staff and students for individual and research work.

Areas for improvement

- It is important for the university to increase the number of available international databases which have the most significant value for the industry. Students' motivation to use the databases and international electronic libraries in their educational and scientific activity should be improved.
- Research work of students should be more connected with the activity of Russian and international research centres.
- The infrastructure should be enhanced to provide accessibility for the teaching staff and students with disabilities.
- The attention should be paid to the improvement of the feedback system for evaluation of the programmes by the students and making adjustments.

STANDARD 6. Information system providing effective implementation of the study programme

Compliance with the standard: **full compliance**

Good practice

The system of collection and analysis of information is used to manage the educational programmes.

The level of integration of local electronic resources is high, there are complete methodological and educational materials available for the students in the local university network.

Students of MIET have access to all the databases, books and other educational and scientific materials.

Areas for improvement

- The system of collection, analysis and distribution of information should be improved and should include the mechanism for data validation. It is necessary for ensuring the effectiveness of management processes.
- There is some information about the achievements of the programmes undergoing accreditation in comparison to the achievements of similar programmes of the other Russian universities. However a lot of efforts should be made to make such a comparison regular.
- A lot of attention should be paid to the benchmarking of educational resources.

STANDARD 7. Public information

Compliance with the standard: **substantial compliance**

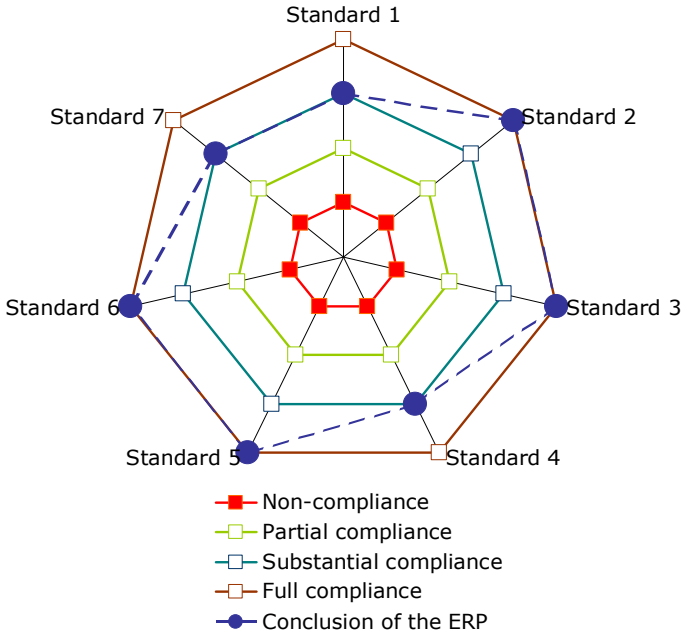
Good practice

The information on the curricula, schedules, learning outcomes, teaching staff qualification and opportunities for students is accurate and available on the website of the university.

Areas for improvement

- The information in English should be placed on the website.
- Open statistical data should be available to compare the results of graduates' employment and to evaluate the quality of education.
- Graduates and employers should be more actively involved in the procedures for independent evaluation of the quality of the educational programmes.

DISTRIBUTION DIAGRAM OF THE EXTERNAL REVIEW OUTCOMES



Standard 1. Policy (mission, vision) and procedures for quality assurance
Standard 2. Approval, monitoring and periodic review of programs and qualifications
Standard 3. Assessment of student learning outcomes / competencies
Standard 4. Quality assurance and competencies of teaching staff
Standard 5. Learning resources and student support
Standard 6. Information system providing effective implementation of the study programme
Standard 7. Public information

CONCLUSION OF THE EXTERNAL REVIEW PANEL

Based on the self-evaluation report analysis, documents and data submitted, interviews with the representatives of the professional communities, students, post graduates, doctor-degree students, staff and administration of the educational institution the External Review Panel came to the conclusion that educational programmes "Electronics Engineering and Technology (211000.62, 211000.68)", "Electronics and Nanoelectronics (210100.62, 210100.68)", delivered by National Research University "MIET", to a large degree comply with the standards and criteria of public accreditation of the National Centre for Public Accreditation.

The Review Panel would like to highlight the following strengths of the educational programmes undergoing accreditation: availability of material base which meets the latest requirements of technical process; inclusion of the disciplines taught in English to the curriculum; involvement of employers into determining and updating objectives and content of the educational programmes.

The External Review Panel recommends the National Accreditation Board **to accredit the educational programmes in "Electronics Engineering and Technology (211000.62, 211000.68)", "Electronics and Nanoelectronics (210100.62, 210100.68)" for the period of 6 years.**

SCHEDULE OF THE SITE VISIT OF THE EXTERNAL REVIEW PANEL

Time	Activity	Participants	Venue
February 12, Wednesday			
09.45	Arrival at MIET		
10.00 – 11.45	The first meeting of the External Review Panel (ERP) members and coordinators of the review of the educational programmes of MIET		Staff Library Room
11.45 – 13.00	**Meeting of the ERP with the university administration and staff members responsible for accreditation**	Rector, vice-rectors, Head of the Educational Process Department, Head of the Centre for Licensing, Accreditation and Main Activities Analysis, two ERPs	Staff Library Room
13.00 – 14.00	Lunch	ERP	Cafeteria, MIET
14.00 – 15.00	**Excursion around the university**	ERP, coordinators from MIET	
15.00 – 15.30	Internal meeting of the ERP	ERP	Room 4228
15.30 – 16.30	**Meeting with staff members responsible for accreditation of the cluster of educational programmes and chairs of the educational programmes under review**	Dean of the faculty, deputy deans, department heads, ERP	Room 3239a
16.30 – 17.00	Work with documentation/attending classes (on request of the ERP members)	ERP	Room 4228
17.00 – 18.00	**Meeting with alumni**	Alumni, ERP	Room 3239a
18.00 – 18.30	Internal meeting of the ERP	ERP	Room 4228

February 13, Thursday			
9.45	Arrival at MIET		
10.00 – 11.00	**Meeting with teaching staff**	Teaching staff, ERP	Room 3239
11.00 – 11.30	Internal meeting of the ERP	ERP	Room 4228
11.30 – 12.30	**Meeting with students**	Students, ERP	Room 3239
12.30 – 13.00	Internal meeting of the ERP	ERP	Room 4228
13.00 – 14.00	Lunch		Cafeteria, MIET
14.00 – 14.30	**Meeting with doctorate students**	Doctorate students, ERP	Room 3239
14.30 – 16.30	Work with documentation/attending classes (on request of the ERP members)	ERP	Room 4228
16.30 – 17.30	**Meeting with employers**	Employers, ERP	Room 3239
17.30-18.00	Internal meeting of the ERP	ERP	Room 4228
February 14, Friday			
9.45	Arrival at MIET		
10.00 – 13.00	Internal meeting of the ERP: discussion of preliminary results of the site visit, preparation of the oral report of the panel	ERP	Room 4228
13.00 – 14.00	**Closing meeting of the External Review Panel with MIET representatives**	University administration, heads of the major departments, teaching staff, students, two ERPs	The Academic Council Hall Room 3103
14.00 – 15.00	Lunch		Cafeteria, MIET
	Departure of the ERP members		