INTERNATIONALIZATION OF HIGH EDUCATION IN TECHNOLOGICAL UNIVERSITIES OF RUSSIA

AN EXAMPLE OF BAUMAN MOSCOW STATE TECHNICAL UNIVERSITY
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MAIN INCOMING FLOWS OF FOREIGN STUDENTS

TOTAL: 108084 students
28.2%
Natural Sciences, Engineering & Technology

1.3%
BALTIC countries

3.3%
NORTH and Latin AMERICA

7.3%
EUROPE

6.3%
NORTH AFRICA & Middle EAST

7%
AFRICA

39.1%
Commonwealth of Independent States (CIS)

35.7%
ASIA

CHINA, INDIA, VIETNAM, MYANMAR, MALAYSIA...

MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION
DEPARTMENT OF INTERNATIONAL COOPERATION
CENTER OF SOCIOLOGICAL RESEARCHES Statistical Collection Issue 8, 2010
BAUMAN MOSCOW STATE TECHNICAL UNIVERSITY. POSITION IN RUSSIAN AND GLOBAL RANKING 2010-2012

RUSSIAN RANKING of technical and technological universities

1. Bauman Moscow State Technical University
2. National Mineral Resources University (St. Petersburg)
3. Moscow State Mining University
4. Gubkin Russian State University of Oil and Gas (Moscow)
5. St. Petersburg State Polytechnic University (SPBSTU)
6. Moscow State Technological University "Stankin"
7. Tomsk Polytechnic University (TPU)
8. Moscow Institute of Electronic Technology (MIET)
9. Russian State Geological Prospecting University n. a. Sergo Ordzhonikidze (MGRI-RSGPU)
10. Moscow Power Engineering Institute (Technical University) (MEI)

QS WORLD University Ranking

- 2012
  - 352
  - 305 Natural Sciences
  - 211 Engineering & Technology
- 2011
  - 379
  - 365 Natural Sciences
  - 229 Engineering & Technology
- 2010
  - ----

The best Russian Universities

1. Lomonosov Moscow State University
2. St. Petersburg State University

WHY
Russian universities are the successors of the universities of Soviet republics of the SU and traditionally focused on education but global rankings put emphasis on R & D component. Approximately 80% of universities in Russia are not providing today R & D at all!

Unusualness of criteria and world rankings indicators for the Russian universities and thus low scores

Weak internationalization

Low citation of Russian scientists and a small number of publications in international journals

Lack of regular work with rankings information agencies

**Resume:** Rankings creators can not properly understand, process, and interpret data on the leading Russian universities.
INTERNATIONALIZATION AS A FRAME OF GLOBALIZATION
UNIVERSAL APPROACHES IN HIGH EDUCATION

MUTUAL UNDERSTANDING
(Long-term academic and cultural policy, common standards of education, etc.)

REVENUE-GENERATING
(balanced system of paid education, equal opportunities in the labor market for native professors, graduates and foreigners, the co-profit cooperation,...)

\[ \sum_{n=1}^{4} [MU + SM + RG + CB] \]

SKILLED MIGRATION
(Professors, teachers, researchers, students migration...)

CAPACITY BUILDING
(academic mobility, university associations, co-authoring of textbooks, handbooks, joint research and educational program, cross-citation... )
| MU | Absence of clear, consistent and long term policy on State and private educational entities for the integration into the global educational process, Based on the requirements of labor market |
| MU | Imperfect legislation on the international procedures for accreditation of qualifications and forms of international cooperation between universities |
| MU SM | Weak government support for exporters of educational services |
| MU | Curricula poorly correspond with international standards |
| CB | The limited use of foreign programs, textbooks, literature and communication of information sources in the educational process |
| CB SM | Low mobility of teachers. Insufficient number of professors with international teaching experience which are ready to delivering courses in English |
| RG | Leaders are the state technical universities and have a low share of paid education 5 - 15% |
INTERNATIONAL PARTNERS-UNIVERSITIES OF THE BMSTU

Finland
- Helsinki University of Technology
- University of Helsinki
- Institute of Technology in Espoo-Vantaa
- Lappeenranta University of Technology

Sweden
- Royal Institute of Technology
- Chalmers University of Technology

Germany
- Technical University of Munich
- Magdeburg University by Otto von Guericke
- Technical University of Berlin
- Berlin Graduate School of Economics and Technology
- Technical University of Dresden
- University of cooperative learning (Mosbach)
- Fraunhofer Institute for Nondestructive Control
- Higher Vocational School Shmaikalden
- Friedrich-Alexander University (Erlangen-Nuremberg)
- Professional Academy (Mosbach)

China
- Institute of 17-China Space Corporation of mechanics and electronics
- Beijing Institute of Information Technology (BITI)
- Zhejiang University
- Tsinghua University
- Beijing Polytechnic University
- University of Science and Technology of China

France
- The group of schools Grandes écoles:
  - Graduate School of Engineering in Paris, Lyon, Nantes, Lille
  - Polytechnic School of Paris
  - Higher National School of advanced technologies (Paris)
  - School of Mining (Paris)
  - School of Mining (Ales)
  - National Engineering School of Saint-Etienne
  - Engineering Institutes in +
  - University Joseph Fourier Grenoble

Italy
- Politecnico di Milano University
- University of Cassino
- University of Udine
- University "La Sapienza" in Rome
- University of Florence

USA
- Lawrence Technological University
- University of Illinois
- University SUNY
- Georgia Tech University
- University of San Jose
INTERNATIONAL STATE, RESEARCH AND INDUSTRIAL PARTNERS FOR DOUBLE AND TRIPLE SIDE COOPERATION

EDUCATION

- Scholarships and Double diploma support.
- Internship and Staff training.
- Labs training.
- Targeted training in the interests of the employer.

RESEARCH & DEVELOPMENT

- Basic research.
- Search, design and development projects.
- Development of engineering applications and technologies.
- Scientific and Education laboratories.

Totally 1000 educational projects and 100 research partners from 35 countries. The Asian partners are China, Korea, and Vietnam.
INTERNATIONAL SCIENCE AND EDUCATION CENTER OF ION AND PLASMA TECHNOLOGY

Elaboration of new sources of plasma and development of technologies for its application in industry, medicine and energy sector

Distribution of ion and plasma technologies in different industries

Gregor Morfill
Professor, Director of Max Planck Institute for Extraterrestrial Physics (Germany)

RESULT

Equipment for fusion and fission of nanopowder
Magnetron sputtering systems of high efficiency
Ion sources with electromagnetic focus of particle beam
Superhard materials
Plasma equipment for surgery and therapy
Thermonuclear reactor and software for calculation of its working process

OPEN PLATFORM FOR FUNDAMENTAL AND APPLIED RESEARCH
MISSION

Research and development in the realm of Terahertz radiation
Search for circuit solutions to develop Terahertz range lasers on the basis of graphene.

RESULTS

Equipment for diagnosis and detection of tumors
High power stable lasers
Precision multicoated optical elements
Devices for film coating measurement
Baggage scanning devices

Victor Ryzhiy
RAS Corresponding Member, Professor, Leading Scientist of Aizu University (Japan)
EDUCATION FOR INTERNATIONAL STUDENTS

Representation of international students in BMSTU in 2011-2012

285 CIS
195 Myanmar
126 China
61 Vietnam
48 Korea
37 France
36 Saudi Arabia
26 Turkey
23 Latvia Mongolia Nepal
18 Germany Georgia
17 Israel Yemen
16 Columbia Costa Rica
13 Serbia Estonia
10 Bolivia Brazil Egypt

Number of international students enrolled in different educational programs in 2011-2012

- Bachelor Degree: 79 (2011) vs. 76 (2012)
- Master Degree: 126 (2011) vs. 115 (2012)
- Specialist: 268 (2011) vs. 265 (2012)
- Postgraduate Studies: 4141 (2011)
- Doctorate: 2 (2011) vs. 2 (2012)
- Internship: 5757 (2011)
- Preparatory Department: 8788 (2011)
ADAPTATION OF INTERNATIONAL STUDENTS

Festivals and competitions

Conferences

Intensive language courses
BMSTU offers intensive courses in Russian Language of different duration (from 2 weeks to 12 months) on the basis of the universally recognized methods developed in BMSTU

Sports events

Linguistic conferences for international students of Russian universities are held every year

BEST
Board of European Students of Technology

BMSTU COUNCIL of Expatriates' Communities
EXAMPLE OF COTUTELLE

18 months in BMSTU + 18 months in host University = Double/Single Doctoral Degree

Trilateral Agreement

BMSTU

BMSTU Engineering Degree or M.Sc. Degree

1

2

3

BMSTU Ph.D. and/or Ph.D. of French university

Ecole Centrale LYON

Ecole Centrale LYON (France)

Company MICHELIN

INP Grenoble (France)

ALSTOM Hydro (France)

BMSTU Engineering Degree

BMSTU Engineering Degree

BMSTU Engineering Degree

Institut National Polytechnique de Grenoble Ph.D.
EXAMPLE OF DOUBLE-DEGREE

Trilateral Agreement

Ecole des Ponts ParisTech

LAFARGE

M1

M2

ENPS Engineering Degree

BMSTU Engineering Degree
BMSTU PARTICIPATION IN ASSOCIATIONS OF UNIVERSITIES

ASSOCIATION OF SINO-RUSSIAN TECHNICAL UNIVERSITIES (ASRTU)

TECHNICAL CONSORTIUM WITHIN THE FRAMEWORK OF CIS NETWORK UNIVERSITY

15 + 15

ASSOCIATION OF TECHNICAL UNIVERSITIES

TOP INDUSTRIAL MANAGERS FOR EUROPE

TIME members include more of 50 the following engineering schools and technical universities in Europe

Bauman Moscow State Technical University
Russian State University of Oil and Gas н.д. И.М. Губкин
Ural Federal University н.д. Б.Н. Елчин
State Engineering University of Armenia (Polytechnic)
Tajikistan Technical University н.д. М.С. Оджомов
National Aerospace University н.д. Н.Е. Жуковский
«Kharkov Aviation Institute»
Ivano-Frankivsk National Technical University of Oil and Gas
Kazakh National Technical University н.д. К.Т. Сатпаев
INTERNATIONAL YOUTH SCIENTIFIC AND DESIGN TEAMS

BMSTU youth space centre
4 international projects

Project Micro-satellite “BAUMANETZ-2”

Team: 64 students
43 BMSTU
21 Montpellier-2 (France)

THE WORLD'S ONLY student space flight control center

Operating orbits (altitude) 500-700 km
Resolution 50 m/pixel (at 520 km altitude)
Capturing span 400 km (at 520 km altitude)

In progress (not launched yet)
INTERNATIONAL YOUTH SCIENTIFIC AND DESIGN TEAMS

Underwater robotics
Design, assembling, operating

Teams: 10-30 students for each project

Remote Operating Vehicles

International Competitions (Houston, Hawaii)
“Education through science”

We believe that since science have no limits then education should cover all world through internationalization.

BRAIN GAIN + BRAIN DRAIN = GLOBAL KNOWLEDGE CIRCULATION

Thank you!