

“The Three University Missions” 2022 Methodology

The first draft of the Moscow International University Ranking “The Three University Missions” (MosIUR) methodology was developed following a large-scale public discussion with over 100 collective contributors, such as universities, rector councils, expert associations, and rating agencies. The list of ranking criteria was submitted for consideration to the ranking’s International Expert Council, comprised of 25 renowned higher education experts from Belgium, Brazil, China, India, Iran, Italy, Poland, Russia, South Africa, Turkey, the UK, and the USA.

Expert discussions continued after the release of the MosIUR pilot version, December 2017. Following the feedback, some ranking indicators were adjusted, and the shortlist of participating universities was expanded to 500. In 2019 the shortlist featured over 1700, in 2020 – over 1800, in 2021 – over 2000, and in 2022 – over 2200 higher education institutions (HEIs), representing 129 countries and territories.

Shortlisted Universities

The MosIUR 2022 shortlist was largely comprised of about 2000 HEIs shortlisted in 2021. The number of institutions representing any given country was meant to be proportional to the country’s contribution to the world economy. Universities with leading positions in global university rankings and/or national academic rankings listed in the IREG Inventory of National Rankings were included in the evaluation list. In some cases, the selection was based on the number of the university’s academic papers from 2017 to 2020 indexed by the Web of Science Core Collection citation database, according to data obtained by the analytical tool InCites. Furthermore, narrow-focused HEIs, i.e., those without educational programs in at least two out of six research areas according to the Organization for Economic Co-operation and Development (OECD) classification, and HEIs with no Bachelor’s, Master’s and PhD programs or their equivalents were excluded from consideration. Higher education institutions with a student body of less than 500 were excluded from the list as well.

Information Sources

The ranking uses exclusively objective indicators approved by international experts. Reputational surveys are excluded entirely. Information sources include open access data from official websites of universities and national authorities, as well as data obtained from independent international sources, such as: bibliometric data provider Clarivate Analytics; largest online course platform aggregator “Class Central”; mass education platforms Open Education (Russia) and icourse163.org (China); free content, multilingual online encyclopedia Wikipedia; search engines (Google, Yandex, Baidu); social networks (Facebook, Twitter, VK, Sina Weibo); Alexa – one of the world leaders in web-analytics; and international student competition websites and scientific awards from the IREG List of International Academic Awards.

Ranking Calculation

The overall weight of indicators per group is 45% for Education, 25% for Research, and 30% for University and Society.

For each indicator, a score was calculated to characterize the university’s position in relation to its competitors. The calculation was carried out in two ways:

1) For normalized indicators (global and national citations, share of publications and transparency), the score of the participating HEIs was calculated according to:

$$x_i = \frac{a_i - a_{min}}{(a_{max} - a_{min})},$$

Where

x_i is the score of the i^{th} indicator

a_i is the value of the i^{th} indicator

a_{max} is the maximum value of the i^{th} indicator

a_{min} is the minimum value of the i^{th} indicator

2) In cases where linear calculation was not applicable, data normalization methods have been used.

Subsequently, scores of universities for each ranking indicator were multiplied by corresponding weight coefficients. Finally, weighted university scores in all indicators were summed up:

$$f = \sum_{i=1}^{n_x} x_i v_i,$$

Where

f is the ranking score

x_i is the score of the i^{th} indicator

n_x is the number of ranking indicators

v_i is the weight of the i^{th} indicator

“The Three University Missions” 2022 Indicators

#	Name	Parameters	Weight, %	Meaning	Data source	Details
I. Indicator Group: Education						
1.	Amount of student wins in international student contests	Student competitiveness	7	Unlike common scientometric indicators, that measure academic personnel achievements, this innovative criterion makes it possible to measure student competitiveness. The criterion demonstrates quality of knowledge, skills, and competence, university students obtain during their studies, as well as their ability to use these resources to solve complex tasks. The number of winners of international student competitions and other prestigious international contests cannot be large; however, the number of Prize winners of prestigious contests is a focused way of demonstrating effectiveness of learning and students' aptitudes for breakthrough scientific research.	Websites of international contests	Individual wins and team victories in 17 international student contests* from 2017 to 2021 are calculated similarly to the Olympics medal tally (considering both prizewinners and medalists). Each contest is given a weight depending on the number of countries covered (for example, the ACM ICPC, which brings together students from over 100 countries, was assigned the maximum weight — 1.00; while NSUCRYPTO and Belgrade Business International Case Competition with participants from as few as 9 countries have a weight of 0.09). The weighted values are summed up.
2.	Share of international students	Attractiveness for international students	8	This indicator shows the proportion of international students to the total number of students. It is widely used by existing academic rankings.	Websites of universities and regulatory bodies	International students of all full- and part-time Bachelor's, Specialist's, Master's, and PhD programs (ISCED-2011 Levels 6-8), that spent more than 3 months in university in the specified year (given to the total of students in full-time Bachelor's, Specialist's, Master's, and PhD training programs). The number of students was converted to full-time equivalent (FTE).
3.	University budget to student ratio	Financial resources	15	This criterion evaluates a university's financial wellbeing. The higher the indicator, the wider the range of opportunities to implement the three main missions of a university: education, scientific research, and contribution to society.	Websites of universities and regulatory bodies	As the cost of products and services may vary significantly from country to country, the budget was converted into USD using purchasing power parity (PPP) defined by the World Bank (or in case the necessary value was not present, PPP defined by OECD). Students of all full- and part-time Bachelor's, Master's, and PhD programs (ISCED-2011 Levels 6-8) were considered. The number of students was converted to FTE.
4.	Student to academic staff ratio	Human resources	15	The indicator measures university staffing. The more faculty and research staff per student, the more attention university staff may give to each student, and, therefore, the better the learning conditions for the latter.	Websites of universities and regulatory bodies	The number of academic personnel (academic staff and researchers) is calculated on FTE basis. Students of all full- and part-time Bachelor's, Master's, and PhD programs (ISCED-2011 Levels 6-8) were considered. The number of students was converted to FTE.

#	Name	Parameters	Weight, %	Meaning	Data source	Details
II. Indicator Group: Science						
5.	IREG List awards won by academic staff and alumni	Outstanding scientific achievements	7	The proposed metric is an elaboration of the approach proposed by the Shanghai ranking. Fundamentally, the idea of counting the number of winners of prestigious prizes to assess a university's scientific potential is correct. However, considering only Nobel and Fields Prizes severely limits the scope for evaluating an HEI. Therefore, we used the IREG List of International Academic Awards, which includes the world's 99 most prestigious scientific awards (with a possibility of expanding the list in the future).	Websites of international awards	The weighted number of awards from the IREG List of International Academic Awards received by academic staff and alumni between 2000 and 2021. Only permanent university staff members as of the date of prize giving are considered. Those who have successfully completed their undergraduate, graduate, and postgraduate studies (and programs equivalent to those listed) are counted as graduates.
6.	Average normalized citation impact (global level)	Quality of scientific publications (international level)	10	Normalized citation impact quantitatively shows how much better or worse than the global average a particular publication is cited compared to publications of the same type, area of knowledge, and year of publication. The indicator demonstrates global relevance of a university's research activities within academia, reflecting its acuteness and quality. Normalized citation indicators are widely used by academic rankings.	Web of Science Core Collection	Publications dated 2017-2020 are considered. Normalized citation impact values are calculated separately for six research areas according to OECD classification (Natural Sciences, Engineering and Technology, Medical and Health Sciences, Agricultural Sciences, Social Sciences, Humanities). Scores gained in each area of knowledge are summed up.
7.	Average normalized citation impact (national level)	Quality of scientific publications (national level)	3	This indicator demonstrates global relevance of a university's research activities within academia of its home country. Introducing this criterion contributes to a better consideration of achievements of national research schools and a more accurate research output evaluation in the humanities.	Web of Science Core Collection	Publications dated 2017-2020 are considered. This indicator's calculation differs from global level average normalized citation: a ratio of a university's normalized citation impact to its country's respective value is calculated for each of the six research areas. The final value is a relation of the university's result to the best result among universities of its country.
8.	Research income per academic staff member	Involvement of staff in research and development	5	The indicator shows the amount of R&D funds raised per academic staff member. The higher the amount per staff member, the more in-demand university research is. For universities that collect data on expenditure rather than income, the indicator is calculated as expenses (budget) per academic staff member.	Websites of universities and regulatory bodies	Funds attracted for academic research and development, except income from education activities, investment, commercialization etc. In case country-specific features or other peculiarities do not allow to calculate research income, research budget as the amount of money, spent on research, is used. Values are converted into USD using purchasing power parity (PPP) defined by the World Bank (or in case the necessary value is not present, PPP defined by OECD). The number of academic personnel, including teaching and research staff, is calculated on FTE basis.

#	Name	Parameters	Weight, %	Meaning	Data source	Details
III. Indicator Group: University & Society						
9.	Amount of Massive Open Online Courses (MOOCs)	Contribution to affordable online education	6	This innovative indicator, applied for the first time in the practice of global academic rankings, measures a university's activity in developing MOOCs. There is a clear public demand for open online courses, and the fact that this education activity is rapidly developing is beyond doubt. The more courses are published on online platforms, the broader the knowledge a university delivers through the internet, and the greater its contribution to the accessibility of education worldwide.	“Class Central” aggregator, Open Education, icourse163.org	Total number of MOOCs published on online learning platforms, considered by “Class Central”, as well as on Open Education and icourse163.org, at the time of data collection (June 2022). Each platform is weighted according to the number of course-participants of that platform (Coursera, edX, FutureLearn, Open Education and icourse163.org have a maximum weight of 1.00). Obtained weights are summed up.
10.	University's share in total national publications	Contribution to a country's scientific research	4	This innovative ranking indicator measures national significance of universities for scientific development in their respective countries. The higher a university's share in country's total university publications, the bigger its contribution to research in the country, and consequently, the higher such a university's importance and value for society.	Web of Science Core Collection	Ratio of a university's scholarly output, measured by the total number of academic papers published 2017-2020 (indexed by Web of Science Core Collection database), to its home country's scholarly output. The final value is a relation of the university's result to the best result among universities of its country.
11.	Total pages of a university's website indexed by leading search engines	Web presence	3	The indicator evaluates a series of the most important aspects of a university's interaction with society: openness and transparency, information availability, commitment to information exchange.	Google, Baidu, Yandex	The number of web pages of a university's official domain, indexed by search engines, is measured by standard domain search syntactical operators of Google, Baidu and Yandex search engines. The minimum index value according to each engine was determined after a series of data retrievals in April and May 2022. The highest result of the three search engines is used as the final value.
12.	Views of the university's page on Wikipedia	Popularity on the web	1	Along with the official university website, Wikipedia is an important source of information. Many views on the university's page on Wikipedia testify to a university's impact on society.	Wikipedia	Total views of university Wikipedia pages in English and (if applicable) in official national language (languages) in 2021.
13.	Followers on university social media	Communication on social media	3	Social media is one of the most practical communication tools for the university and those interested in its activity. A significant number of universities creates awareness of their activities through social media. The popularity of different social networks varies in different countries and from university to university. Therefore, the number of subscribers on 4 social medias is collected for each university.	Facebook, Twitter, VK, Sina Weibo	The number of subscribers on university social media (Facebook, VK, Twitter and Sina Weibo) on English and pages in national languages (if applicable) are considered. The final score is a sum of subscribers in two social networks, where a university has its largest audience.

#	Name	Parameters	Weight, %	Meaning	Data source	Details
14.	Number of alumni with an individual article about them on Wikipedia	Alumni impact on society	7	Quality education is made up of largely incommensurable phenomena, including the extent to which a university has an impact on society. One of the most effective ways to measure this is to count the number of alumni who are successful in various areas (politics, science, art, business, charity) and possess an individual article about them on Wikipedia. This indicator quantifies the university's impact on society	Wikipedia	Total number of university alumni with a personal page on Wikipedia meeting following criteria: alumnus date of birth not prior to 1951 and at least 1000 page views in 2021. Unpopular pages are thus excluded from calculation.
15.	University website reach	Societal relevance	4	This indicator reflects relevance of a university's official website for users from all over the world. The higher the visit ratio, the more popular a university is. If the website is visited by many Internet users, then the university is considered relevant and valuable for society.	Alexa	This criterion evaluates a university's website audience percentage among all Internet users. Data was provided by one of the global leaders in web analytics Alexa (alexa.com), retrieved through API on the website https://website.informer.com and compiled May 2022.
16.	Transparency	Informational openness and quality of information policies	2	This indicator is a complex evaluation of university policies related to informational openness to society, their consistency, and extent to which a university encourages horizontal communication.	Websites of universities	This indicator considers the availability of following resources, materials, and publications on a university's official website: up-to-date institutional report, up-to-date financial report, open access list of university staff (or open access staff search system), mission of the university.

* list of student contests:

- ACM International Collegiate Programming Contest
- Belgrade Business International Case Competition
- Green Brain of the Year Contest
- International Mathematics Competition for University Students
- John Molson Undergraduate Case Competition
- McGill Management International Case Competition
- Network of International Business Schools Worldwide Case & Business Plan Competitions
- NSUCRYPTO
- SCORE Software Engineering Contest
- The Annual Willem C. Vis International Commercial Arbitration Moot
- The Mathematical Contest in Modeling
- The Philip C. Jessup International Law Moot Court Competition
- The SIAM Award in the Mathematical Contest in Modeling
- The University Physics Competition
- The World Universities Debating Championships
- Global Investment Banking Valuation Olympiad
- LafargeHolcim Awards