

Shanghai Ranking's Global Ranking of Academic Subjects 2022

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The performance of the Indian higher educational institutions (HEIs) in the Shanghai Ranking's Global Ranking of Academic Subjects (GRAS) 2022 in engineering and science confirms that engineering and natural sciences constitute most of the country's research base. In medical sciences, it registers only a middling level of performance. In social sciences and life sciences, there is hardly any presence. A matter of concern is that in the recent past, India's presence in GRAS has declined.

Keywords: Academic subjects, higher educational institutions, research performance, world universities.

THE Shanghai Ranking appeared for the first time in 2003. It promised 'internationally comparable data that everyone could check'. It was based on stringent research evaluation criteria covering a wide range of disciplines and permitted an easy comparison of the research-intensive universities across the world. Only three institutions appeared from India in the top 500 which provoked the following editorial comment in these pages¹: 'the best of Indian institutions does not compare well on an international scale'. None of the 'real' universities found a place in this top list².

The Shanghai Ranking has found more imitators since then, and as of today, the Shanghai Ranking Consultancy (SRC) remains the most reliable, offering two flagship products annually: the Academic Ranking of World Universities (ARWU) ranks 1000 leading research universities in the world and the Global Ranking of Academic Subjects (GRAS) ranks universities in 54 subjects. The areas cover natural sciences, engineering, life sciences, medical sciences and social sciences. Here, we shall curate the performance of the Indian higher educational institutions (HEIs) in GRAS 2022, along with an earlier exercise for GRAS 2018 reported in these pages³.

Shanghai Ranking's GRAS 2022 was released on 19 July 2022. Since 2009, SRC has published subject-wise rankings. The 2022 release has listed about 1800 universities from 96 countries and regions. The United States dominates the list, with universities appearing 4714 times. Chinese universities appear 3108 times and universities from the United Kingdom appear 1613 times. The University of New South Wales, University of British Columbia, University of Toronto, National University of Singapore and the University of Queensland appear in more than 50 subjects. Table 1 lists the fields and subjects for 22 engineering disciplines and 32 under four major science fields: natural sciences, life sciences, medical sciences and social sciences.

All data was curated from the websites <https://www.shanghai-ranking.com/news/gras/2022> and <https://www.shanghai-ranking.com/> between 25 and 28 July 2022.

Results and discussion

As in our earlier study³, we have now made a curated list of India's presence in GRAS 2022 (Table 1). In Table 2, we show the fields and 21 subjects in which India has no presence in GRAS 2022. The country's research base is highly skewed toward engineering (84 units of assessment) and natural sciences (30 units of assessment). In medical sciences, there are 13 units of assessment and only 2 in life sciences and 4 in social sciences.

The Indian Institute of Technology (IIT) at Kharagpur and the Indian Institute of Science, Bengaluru, appear in 14 subjects. The IITs in Bombay (13), Delhi (9) and Madras (8) have performed creditably. The Academy of Scientific and Innovative Research appears in six subjects.

Table 3 shows that India's presence in the SRC GRAS league tables has diminished over the last five years mainly due to the exit of several institutions in engineering subjects. Anna University (10) and Jadavpur University (7) in GRAS 2018 in our earlier study³, now have only one subject and none respectively. The presence of the IITs taken together as a system in the engineering field alone has declined from 77 units of assessment in 2008 to 52 in 2022. A notable success story is the Vellore Institute of Technology which appeared only once in 2018 (chemical engineering) but now appears in five subjects (chemical engineering, computer science and engineering, electrical and electronics engineering, energy science and engineering, and instruments science and technology).

A total of 45 unique HEIs have appeared 154 times in GRAS 2022. India's share of HEIs in the SRC rankings is about 2.5% of the 1800 universities from 96 countries, and its share of appearance is only 0.81% of the 19,100 times that the 1800 universities have appeared in GRAS 2022.

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GENERAL ARTICLE

Table 1. Fields and subjects in which Indian universities have been ranked by Shanghai Ranking Consultancy (SRC) Global Ranking of Academic Subjects (GRAS) 2022

Institution	Field	Subject	SR–rank	
Academy of Scientific and Innovative Research	Engineering	Biotechnology	151–200	
	Engineering	Chemical engineering	201–300	
	Engineering	Energy science and engineering	301–400	
	Engineering	Materials science and engineering	401–500	
	Natural sciences	Chemistry	201–300	
	Medical sciences	Pharmacy and pharmaceutical sciences	401–500	
Aligarh Muslim University	Natural sciences	Mathematics	301–400	
All India Institute of Medical Sciences, New Delhi	Medical sciences	Medical technology	301–400	
	Medical sciences	Clinical medicine	301–400	
	Medical sciences	Public health	151–200	
Amrita Vishwa Vidyapeetham	Medical sciences	Clinical medicine	401–500	
Anna University	Engineering	Biotechnology	401–500	
Banaras Hindu University	Engineering	Biotechnology	401–500	
	Medical sciences	Clinical medicine	201–300	
	Engineering	Telecommunication engineering	201–300	
Birla Institute of Technology Science	Medical sciences	Clinical medicine	201–300	
Christian Medical College and Hospital, Vellore	Medical sciences	Public health	201–300	
	Engineering	Food science and technology	201–300	
	Natural sciences	Physics	401–500	
Guru Nanak Dev University	Life sciences	Veterinary sciences	101–150	
Homi Bhabha National Institute	Social sciences	Management	401–500	
ICAR-Indian Veterinary Research Institute	Social sciences	Management	301–400	
Indian Institute of Management, Ahmedabad	Social sciences	Business administration	201–300	
Indian Institute of Management, Bangalore	Engineering	Chemical engineering	401–500	
	Engineering	Electrical and electronics engineering	201–300	
	Engineering	Instruments science and technology	201–300	
	Engineering	Materials science and engineering	201–300	
	Engineering	Mechanical engineering	201–300	
	Engineering	Metallurgical engineering	38	
	Engineering	Nanoscience and nanotechnology	301–400	
	Engineering	Telecommunication engineering	201–300	
	Natural sciences	Atmospheric science	201–300	
	Natural sciences	Chemistry	301–400	
	Natural sciences	Earth sciences	401–500	
	Natural sciences	Ecology	401–500	
	Natural sciences	Oceanography	101–150	
	Natural sciences	Physics	401–500	
	Natural sciences	Physics	301–400	
	Indian Institute of Science Education and Research, Kolkata	Natural sciences	Chemistry	401–500
Natural sciences		Physics	301–400	
Natural sciences		Physics	401–500	
Indian Institute of Technology, Bhubaneswar	Engineering	Automation and control	101–150	
	Engineering	Biotechnology	401–500	
	Engineering	Chemical engineering	201–300	
	Engineering	Civil engineering	151–200	
	Engineering	Energy science and engineering	201–300	
	Engineering	Instruments science and technology	201–300	
	Engineering	Mechanical engineering	151–200	
	Engineering	Metallurgical engineering	101–150	
	Engineering	Transportation science and technology	151–200	
	Natural sciences	Atmospheric science	301–400	
	Natural sciences	Chemistry	301–400	
	Natural sciences	Earth sciences	301–400	
	Natural sciences	Physics	401–500	
	Indian Institute of Technology, Delhi	Engineering	Biotechnology	301–400
		Engineering	Chemical engineering	201–300
		Engineering	Civil engineering	201–300
Engineering		Computer science and engineering	401–500	
Engineering		Electrical and electronics engineering	201–300	
Engineering		Instruments science and technology	101–150	

(Contd)

Table 1. (Contd)

Institution	Field	Subject	SR–rank
Indian Institute of Technology, Gandhinagar	Engineering	Mechanical engineering	151–200
	Engineering	Metallurgical engineering	151–200
	Natural sciences	Atmospheric science	201–300
Indian Institute of Technology, Guwahati	Natural sciences	Atmospheric science	301–400
	Natural sciences	Physics	301–400
Indian Institute of Technology, Hyderabad	Engineering	Biotechnology	301–400
	Engineering	Chemical engineering	301–400
	Engineering	Mechanical engineering	301–400
Indian Institute of Technology Indian School of Mines, Dhanbad	Engineering	Civil engineering	201–300
	Natural sciences	Physics	301–400
Indian Institute of Technology, Indore	Engineering	Chemical engineering	401–500
	Engineering	Mining and mineral engineering	76–100
Indian Institute of Technology, Kanpur	Engineering	Mechanical engineering	301–400
	Engineering	Chemical engineering	401–500
Indian Institute of Technology, Kharagpur	Engineering	Electrical and electronics engineering	301–400
	Engineering	Mechanical engineering	201–300
	Engineering	Metallurgical engineering	151–200
	Natural sciences	Atmospheric science	301–400
	Engineering	Biotechnology	401–500
	Engineering	Chemical engineering	201–300
	Engineering	Civil engineering	201–300
	Engineering	Computer science and engineering	401–500
	Engineering	Energy science and engineering	301–400
	Engineering	Marine and ocean engineering	47
	Engineering	Materials science and engineering	401–500
	Engineering	Mechanical engineering	101–150
	Engineering	Metallurgical engineering	101–150
	Engineering	Mining and mineral engineering	51–75
	Engineering	Telecommunication engineering	201–300
	Engineering	Water resources	151–200
	Indian Institute of Technology, Madras	Natural sciences	Earth sciences
Social sciences		Management	301–400
Engineering		Biotechnology	401–500
Engineering		Chemical engineering	201–300
Engineering		Energy science and engineering	301–400
Engineering		Instruments science and technology	201–300
Engineering		Materials science and engineering	401–500
Engineering		Mechanical engineering	76–100
Engineering		Metallurgical engineering	51–75
Natural sciences		Physics	201–300
Indian Institute of Technology, Roorkee	Engineering	Biotechnology	401–500
	Engineering	Chemical engineering	301–400
	Engineering	Civil engineering	201–300
	Engineering	Instruments science and technology	201–300
Indian Statistical Institute	Engineering	Mechanical engineering	201–300
	Natural sciences	Mathematics	401–500
Institute of Chemical Technology, Mumbai	Engineering	Chemical engineering	201–300
Jamia Hamdard University	Medical sciences	Pharmacy and pharmaceutical sciences	401–500
Jawaharlal Nehru University	Engineering	Biotechnology	401–500
Manipal University	Medical sciences	Public health	401–500
National Institute of Technology, Kurukshetra	Engineering	Computer science and engineering	401–500
National Institute of Technology, Rourkela	Engineering	Mechanical engineering	301–400
Panjab University	Engineering	Biotechnology	401–500
	Natural sciences	Physics	201–300
Sanjay Gandhi Postgraduate Institute of Medical Sciences	Medical sciences	Clinical medicine	201–300
SRM Institute of Science and Technology	Engineering	Energy science and engineering	301–400
St John's Medical College	Medical sciences	Clinical medicine	151–200
Tata Institute of Fundamental Research	Natural sciences	Ecology	401–500
	Natural sciences	Mathematics	151–200
	Natural sciences	Physics	76–100
	Life sciences	Biological sciences	401–500

(Contd)

Table 1. (Contd)

Institution	Field	Subject	SR-rank
Thapar Institute of Engineering and Technology	Engineering	Computer science and engineering	151–200
	Engineering	Electrical and electronics engineering	401–500
	Engineering	Telecommunication engineering	201–300
University of Delhi	Engineering	Instruments science and technology	201–300
	Medical sciences	Pharmacy and pharmaceutical sciences	301–400
Vellore Institute of Technology	Engineering	Chemical engineering	401–500
	Engineering	Computer science and engineering	201–300
	Engineering	Electrical and electronics engineering	401–500
	Engineering	Energy science and engineering	301–400
	Engineering	Instruments science and technology	151–200
Visva Bharati University	Engineering	Telecommunication engineering	201–300
	Natural sciences	Physics	401–500

Table 2. Fields and subjects in which Indian universities drew a blank in SRC GRAS 2022

Institution	Field	Subject	SR-Rank
NA	Engineering	Aerospace engineering	NA
NA	Engineering	Biomedical engineering	NA
NA	Engineering	Environmental science and engineering	NA
NA	Engineering	Remote sensing	NA
NA	Natural sciences	Geography	NA
NA	Life sciences	Human biological sciences	NA
NA	Life sciences	Agricultural sciences	NA
NA	Medical sciences	Dentistry and oral sciences	NA
NA	Medical sciences	Nursing	NA
NA	Social sciences	Economics	NA
NA	Social sciences	Statistics	NA
NA	Social sciences	Law	NA
NA	Social sciences	Political sciences	NA
NA	Social sciences	Sociology	NA
NA	Social sciences	Education	NA
NA	Social sciences	Communication	NA
NA	Social sciences	Psychology	NA
NA	Social sciences	Finance	NA
NA	Social sciences	Public administration	NA
NA	Social sciences	Hospitality and tourism management	NA
NA	Social sciences	Library and information science	NA

NA, Not available.

Table 3. India’s presence in the SRC GRAS league tables showing a decreasing trend over the last five years

Fields	2018	2019	2020	2021	2022
Engineering	125	108	105	98	84
Natural sciences	26	22	23	22	30
Medical sciences	7	13	12	11	13
Life sciences	0	3	4	2	2
Social sciences	6	7	10	7	4
Total	164	153	154	140	133

Conclusion

In this study, we have curated data from the SRC GRAS 2022. India’s research base is dominated by engineering and natural sciences. However, its global presence in engi-

neering has declined over the last five years. In medical sciences, its performance is average, while it is poor in the social sciences and life sciences. India is far below the top global standards, a concern that was first raised in these pages nearly two decades ago^{1,2}. Another matter of concern is that India’s presence in GRAS has recently declined.

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