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Chairman of the Veterinary Council of India (VCI)

**Dr. Nitin M. Nagarkar**  
Director, AIIMS Raipur

**Veena Kohli**  
Founder and CEO, Vanguard Diagnostics,

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# NCERT BURNING THE MIDNIGHT OIL

**T**he National Council of Educational Research and Training (NCERT) has its hands full. The council has the rather arduous task of revising the entire syllabus for school students as mandated in the new National Education Policy (NEP) 2020.

While it is quite logical to renew textbooks in accordance with changing times, many in the academic circles believe the NCERT is making unpardonable blunders in its efforts to rationalize the syllabus. One of the major reasons behind this syllabus rationalizing process is to reduce the academic burden on children.

So, the NCERT powers that be have dropped Darwin's theory on evolution from class 9 text books and the periodic table from class 10 text books and included both in class 11 books, but mind you, only for the science stream.

It has also dropped Mughal history, the industrial revolution, partition of India from history textbooks in the humanities stream for classes 11 and 12. Also wiped out from political science are topics like the martyrdom of Mahatma Gandhi, India's five-year plans, the emergency and democratic protests in the country.

Kerala, a left-run state, has squarely refused to accept these omissions, and its Chief Minister, Pinarayi Vijayan, has re-released those text books with all portions removed by the NCERT, saying, "chapter(s) dropped in history, politics, economics etc., cannot be justified by any academic group."

"NCERT had made many revisions to the textbooks of classes 6 to 12. The Kerala Government had opposed this decision academically. The argument for the revisions relied on reducing the burden on children in the aftermath of COVID-19, however, any one who sees the text can realize that these changes are not for academic reason but to fulfil certain nefarious purposes," according to a statement released by the Kerala education department.

Meanwhile, the NCERT has constituted a 19-member panel that will have the authority to finalize the curriculum, textbooks and learning material for classes 3 to 12. Some of the personalities in this panel called the National Syllabus and Teaching Learning Material Committee (NCTC) include Infosys Foundation Chairperson Sudha Murthy, singer Shankar Mahadevan and badminton player U. Vimal Kumar. The appointment of these three personalities in the panel has divided the internet, with many doubting their credentials to have a say in developing the school curriculum.

However, the other members of the committee leave little room for debate.

Distinguished academician Mahesh Chandra Pant, chancellor of the National Institute of Educational Planning and Administration (NIEPA), will head this 19-member panel. Prof. Manjul Bhargava – who has won the Fields Medal, the highest award in mathematics – will co-chair the committee.

The others in the group are Dr. Bibek Roy, a renowned economist; Dr. Shekhar Mande, Secretary at the government's Department of Scientific and Industrial Research (DSIR); Dr. Sujatha Ramodrai, the first Indian to win the ICTP Ramanujan Prize; Prof. Michel Danimo, a Franco-Indian historian; Suraina Rajan, a retired IAS officer; Chamu Krishna Shastry, a veteran Sanskrit educationist; Sanjeev Sanyal, a well-known economist; Dr. MD Srinivas, Chairman of the Centre for Policy Studies in Chennai; Gajanan Londhe, NSTC's program office head; and Dr. Rabin Chhetri, Director of the State Council of Education and Research Training (SCERT).

All in all, it seems, our future is in safe hands. Fingers crossed.

**Rohit Wadhwaney**  
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ZHUMALIEV BARSBEK

# EMPOWERING GLOBAL MEDICAL ASPIRATIONS IN KYRGYZSTAN

**Zhumaliev Barsbek**, Vice Dean at the Ministry of Education and Science in Kyrgyz Republic, talks to Education Post's **Prabhav Anand** in a bid to make Indian students explore medical education in the Central Asian country, or in India, where the International Medical University (IMU) has opened a campus. The IMU, he says, is dedicated to adapting its curriculum for international students, emphasizing practical training through rotations and hands-on experiences.

**Can you provide an overview of the current state of medical education in the Kyrgyz Republic for international students?**

Medical education in Kyrgyzstan emphasizes a combination of classroom learning, laboratory work, and clinical training. Students have the opportunity to gain practical experience through rotations in hospitals and clinics.

There are two prominent medical universities in Kyrgyzstan, the Kyrgyz State Medical Academy and International Medical University, located in Bishkek. They offer medical programs at the undergraduate and postgraduate levels. The duration of the undergraduate program is six years at State Academy and five years at IMU, leading to the degree of Doctor of Medicine (MD).

**The IMU has set up a campus in India. Please tell us about the curriculum and other academic rules for medical and allied programs (for example pharmaceuticals) in the Kyrgyz Republic, as compared to Indian ones.**

As an international educational institution, the International Medical University has adapted its curriculum and academic rules to match the standards and requirements of education in different countries, including India and the Kyrgyz Republic.

In both countries, the primary focus of medical education is to prepare students for practical work in the medical field. In the Kyrgyz Republic, the medical education program years at the International Medical University, same as in India, medical education usually lasts 5.5 years, including a year of internship.

In both countries, the program includes teaching the basics of medical science, clinical skills, and undergoing practice in hospitals and clinics. However, there may be some differences in the specific content of courses and approaches to teaching.

Regarding pharmaceutical education, bachelor's and master's programs are offered in both countries. The main subjects usually include pharmaceutical chemistry, pharmacology, pharmaceutical technology, and pharmaceutical biotechnology.

Nevertheless, the specific details of the curricula and academic rules can vary, and students are advised to consult with academic advisors or the international affairs department for more detailed information.



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**What support services are in place for international students at the International Medical University to ensure their smooth integration and academic success?**

**1. Orientation Programs:**

To acquaint international students with the campus, facilities, rules, and regulations, as

well as the academic system.

**2. Department of International Affairs:**

This is a dedicated department to support international students, providing help with visas, housing, cultural adjustment, and other administrative issues.

**3. Language Support:**

University provides language courses

or tutoring to help international students improve their proficiency in the language of instruction.

**4. Academic Advising:**

Academic advisors can help students understand their course requirements, select classes, and provide guidance on academic policies.

**5. Counseling Services:**

Mental health resources and counseling services are often available to help students

cope with stress and cultural adjustment.

**Are there any opportunities for international students to participate in research projects or clinical rotations during their studies?**

Yes, students at the International Medical University have opportunities to participate in research projects and clinical rotations. These experiences not only enhance their understanding of the medical field but also provide them with valuable hands-on practice and industry exposure.

**Please tell us about the expenses for the international students at IMU?**

The price is 5600 USD for the 2023-2024 educational year with all additional fees, including accommodation, insurance, and visa fees.

**Please tell us about collaborations done in India and your experience of letting Indian students study under those collaborations.**

In the case of medical studies, students might have the opportunity to participate in clinical rotations or internships at partnering hospitals in India, or they might join research projects under the guidance of international and local mentors.

These types of experiences can be incredibly beneficial for students. They provide an opportunity to learn from a diverse set of perspectives, acquire knowledge about different healthcare systems, and develop skills in a unique cultural context.

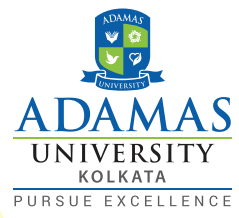
**In the case of medical studies, students might have the opportunity to participate in clinical rotations or internships at partnering hospitals in India, or they might join research projects under the guidance of international and local mentors.**

**Please share some success stories or testimonials from Indian students who have graduated from the International Medical University and are currently practicing medicine?**


International Medical University is still in the early stages of seeing its Indian students graduate. As of now, there are over 30 Indian nationals who have successfully completed their studies.

While there might not be any testimonials yet from these Indian graduates, their success in completing the rigorous medical program speaks volumes about the potential opportunities and quality of education provided by the university. These students have shown perseverance, resilience, and academic excellence, which will no doubt carry over into their medical careers.

The success of these students also sets a positive precedent for future Indian students considering studying at the International Medical University. In the coming years, I'm sure we'll start to hear about the career accomplishments and contributions of these graduates in the field of medicine. 📧



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आरोग्यम् सुखं सम्पदा

Dr. Nitin M. Nagarkar



# DIGITAL HEALTH ECOSYSTEM

WOULD BE A BOON OF INTEROPERABILITY FOR PATIENTS

**Dr. Nitin M. Nagarkar**, Director of Raipur's All India Institute of Medical Sciences (AIIMS) is certain that India, which is already one of the key providers of pharmaceuticals and vaccines in the world, is well on its way to manufacturing medical devices indigenously. Nagarkar, an otology veteran, further tells Education Post's **Tanay Kumar** of some important courses in the medical profession that students can opt for if they fail to do well in the annual NEET examination.

**Please tell us about the motivation to choose otology and becoming a neck-head surgeon. Was there always an academic atmosphere in your family?**

I was born in a normal middle class Marathi family and my ancestry belongs to Belgaon, which is in Buldhana district of Maharashtra. My father, Madhusudan Nagarkar, was a civil engineer. In my entire family and clan, most of the members are/were either engineers or lawyers. In fact, my son is studying engineering. My grandmother, Shakuntala Nagarkar, expressed her wish for me to become a doctor as my father was posted at the Patna Medical College. And ever since then I got inclined towards this noble profession of curing people.

During my medical graduation, we used to see all the organs of bodies and otology captured my attention. Teachers play a very crucial role in our lives. In the medical field, there are many specializations after MBBS. I qualified for many examinations of post-graduation, but the otology department of PGMIR (Postgraduate Institute of Medical Education and



Research) in Chandigarh was very advanced. And it still is.

I thank God that I kept on getting support at every place I've been and I am really elated that I have been able to serve common people of this country in my current role.

Today, usually students opt for either MS ENT or DNB ENT, but you have completed both of them. If a student has to choose one of these two, which one would be better? Surely, both of them have equal importance in the medical domain.

MS stands for Master's in Surgery while DNB stands for Diplomate of National Board. As I mentioned, that one appears for many exams after completing MBBS. So, both are post-graduation courses. In DNB, usually a larger population from the diverse medical fields appears for this exam, while often students opt for MS at their own institution. It also adds better perspectives as one gets a chance to interact with more students from the country.

After doing any of them, one can join and start practicing. I completed both of them. It used to be a trend during our days as it used to be considered beneficial that one does MS from their own college and then qualifies for a national level test.

**Q Doctors and medical residents are always important for any nation, but most of the medical devices and medical instruments are manufactured out of India and they are an added expenditure on the country's exchequer. What's your take on this?**

I would say that we are really rising fast in providing medical solutions to the world. Surely, there are other high-end equipment that need good amount of research and development.

We are on the path of creating and manufacturing medical devices indigenously. Soon we will start having our own medical equipment. We are already one of the key providers of good pharmaceuticals and vaccines. To sum it up, in the forthcoming future, we really are going to be exporters of medical devices also. And, the younger generation of doctors need to work with engineers of medical devices to inform them what is really needed.

**Q Recently, a team at AIIMS Raipur has successfully implanted an artificial talus in a patient's ankle with the help of 3D printing and we have been reading some other cures done in the healthcare sector via this futuristic technology. In your views, how can 3D printing help the medical fraternity in the future?**

Time is changing and so is the technology. So, this surgery you mentioned was successfully operated by a team of orthopedic surgeons of AIIMS Raipur. The patient had a bone tumor in the ankle of one leg. So, we created a mirror 3D image from the second leg, which was fine and then we got it in 3D printed material. The team removed the tumor and placed the 3D printed artificial talus.

First, imaging of the bone and the

body is important. So, technology has really helped us and 3D printing is surely going to help lots of patients as the organs are often in shortage.

**Q NABH has recently issued a notification on Digital Health Standards for Hospitals. Would these standards change medical education in India?**

Let me explain it with an example. Over a period of time, we evolved from printed letters to fax then, short messaging services, then email and now even we can communicate via video chat also. So, technology has not only evolved itself over time, but it has transformed our lives also.

Similarly, in the future, one might not need a kind of bag with over a dozen health reports. Your government identity card would be enough to make your health reports digitized across the country and a patient can show it to any doctor and can get the diagnosis. Interoperability

within the whole health network would become very easy. For example, even today, digital signatures exist when we communicate over mail. So, these standards will make it easy for the common people. Right now, we are in our transition time and there will be a time when getting benefitted by the digital health records would be very common.

**Many students from the PCB in class 12th consider only NEET, MBBS and being a doctor. What are the other fields and streams that biology students should explore, if they fail to get a good score in the NEET exam?**

It's a very good question because surely the country and its youths need to look beyond the conventional and traditional courses that have been existing for decades. Even our own country has registered this diversity in education, but surely, I would say that it is the rate of progress that we need to work on in the diversification of the courses.

Even in medical, the study of pharmaceuticals, biotechnology, bio-instrumentation, medical technology, pharmacology, biophysics and many other courses are available that students can opt for their career to grow and to contribute to the nation's growth as well. Allied health, speech pathology, physiotherapy and many other courses are available.


Nursing is another study which is very challenging but very necessary for our country. The COVID-19 pandemic showed the vitality of this profession to the whole world. Good research guides are another category of profession that

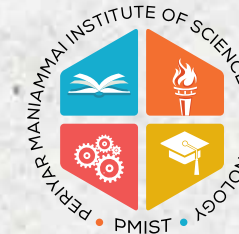
is really needed in our country. Further, I would recommend students to choose the medical profession which is really important for our country.

**Congratulations to the institute for completing its decade in existence and operation. What are some aspirations of the institute going forward?**

First of all, I wish to thank the people of India and the government, both state and central, for creating this institution. On the completion of a decade, I also thank my whole staff and students of the institute.

Coming to the question, the institute has recently just secured 39th rank in the national ranking of medical colleges. It was on the 49th position last year. So, now we are trying our best to be in the top 20 Indian medical colleges and I totally believe that this institute has that potential. My ambition for this institute is to start bone marrow transplant and liver transplant for the well-being of the patients. This would really help a lot of people of Raipur to not move to another city for such procedures. AIIMS Raipur attracts patients from over four neighboring states, besides our own Chhattisgarh state. Patients from Telangana have increased in the past couple of years.

Being a head and neck cancer surgeon myself, I really want to begin and operate efficiently a cancer referral centre. And I know that the district administration, state government and the central government will help AIIMS Raipur to have these facilities. Further, institutes like AIIMS Delhi, Safdarjung Hospital, BHU, PGMIR Chandigarh, are facing a huge load of patients. Enhancing institutes like AIIMS Raipur would free some load from these institutions. 



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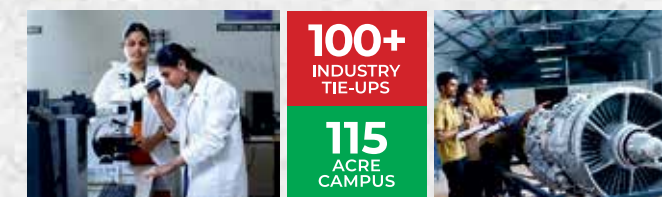


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# AI CAN EXTEND MEDICAL EXPERTISE BEYOND GEOGRAPHICAL BOUNDARIES

**Dr. Saurabh Varshney**, director of the All India Institute of Medical Sciences (AIIMS) in Jharkhand's Deoghar, talks at length with Education Post's **Tanay Kumar** to explain how miraculously beneficial artificial intelligence (AI) and metaverse, which involves a fusion of virtual and augmented reality, can prove to be for the healthcare sector.

completing my training, I got really inclined towards academics. In 1995, I got on board an academic career as a faculty member at a medical college. Over the next 28 years, I dedicated myself to this field, understanding that as educators, we must continue learning to effectively guide the next generation.

Recently, I lost my father, who held an academic record with degrees including M.Sc., M.Phil., Ph.D., and PSC, all earned from the University of Roorkee. He also wrote numerous books and publications during his time as a chief engineer at UP Irrigation.

My mother, Manjula Varshney, although a qualified individual with a double M.Ed., chose to support us as a dedicated homemaker. Her contributions played a vital role in our achievements.

**In November 2021, you wrote a journal titled "Artificial Intelligence (AI) and its Role in Otorhinolaryngology," and we all know that people are going gaga over AI. Please tell us about how you thought to work on this issue and what conclusion you got.**

When discussing artificial intelligence, it's important to consider its core components - artificial and intelligence. Artificial is about creations by humans, while intelligence refers to the ability to train and equip machines to perform tasks to do better than the human brain or at least at that quality. This criterion is particularly crucial when it comes to medical applications, where the objective is to ensure that any artificial intelligence tool or system can match or exceed the capabilities of the human brain.

In the quest to develop such devices, a comprehensive approach is essential. For instance, in collaboration with IIT Roorkee, we are currently engaged in a project focused on addressing challenges faced by patients

**Please take us through your academic and professional journey.**

My father, Dr. Dharamveer Varshney, was a civil engineer, who pursued his Ph.D. in civil engineering from the University of Roorkee – then considered as the country's premiere institution in the field. His academic dedication left a lasting impression on me and laid the foundation for my own aspirations.

As for my journey to becoming a doctor, it was more a matter of default than a choice. My elder brother had already chosen biology in his high school, leaving me with that path to follow. I had to take up biology, and this turn of events, though unintentional, proved as a blessing. Influences from my maternal side further inspired me towards medical – my maternal grandfather, Dr. Ishwar Sharan, was a respected physician and ENT surgeon in Rampur of Uttar Pradesh, along with my maternal uncle who also pursued ENT surgery.

My academic path led me to a reputed medical college, where I pursued both graduation and post-graduation. After



with conditions like Parkinson's disease. By recording and analyzing over 1500 voice patterns of Parkinson's patients, we aim to create software that can enhance speech clarity, thus aiding communication for individuals with this condition.

The process of enabling artificial intelligence in medicine involves deep learning, where the machine learns to distinguish between correct, incorrect, and erroneous data by analyzing variations in different parameters. Take the example of ECG patterns – with more than a thousand representations of ECG data, the machine can swiftly diagnose patients based on the data it has been trained on.

A significant aspect is the creation of refined data banks that serve as the foundation for these applications. While the development of such technology often takes place in developed nations due to resources and funding, its utility is most pronounced in developing countries like India. Despite financial limitations, India possesses a pool of IT professionals and potential that can contribute to the successful implementation of artificial intelligence. Collaboration between

developed and developing nations can thus harness the full potential of this technology.

The concept of the metaverse involves a fusion of virtual and augmented reality, combined with the internet of medicine and artificial intelligence. It allows for innovative medical practices, such as remote teleconsultations, where a patient's presence can be virtually transported to a doctor's consultation room. This technology holds immense promise, especially in regions where access to medical facilities is limited, contributing to the realization of precision medicine – treatment tailored to an individual's unique characteristics.

In essence, artificial intelligence and metaverse provide the means to extend medical expertise beyond geographical boundaries. By establishing centres equipped with virtual technology, we can bridge the gaps in healthcare, bringing advanced medical consultations and treatments to underserved populations. This approach ensures that patients receive personalized, effective, and safe care, thereby revolutionizing the medical landscape and improving health outcomes.

## **This institute is in Jharkhand, which is largely a tribal-populated state. What are the challenges of a medical institute in a tribal state and how is the institute trying to overcome them?**

Establishing more medical institutions like AIIMS was the brainchild of our former Prime Minister, Atal Bihari Vajpayee. He recognized the unequal distribution of tertiary healthcare in the country and advocated for the creation of additional AIIMS facilities to address this plight. This initiative aimed to provide essential tertiary care services to regions lacking access.

AIIMS Deoghar is strategically located in a region where such specialized healthcare is in dire need. Jharkhand, a state that was created out of Bihar in 2000, is still in a developmental phase. For example, areas like Santhal Pargana, that comprises six districts, is underserved. With nearly 28 percent of Jharkhand's population being tribal, and approximately 40 percent of them residing in Santhal Pargana, the health challenges within the tribal community are distinct due to their marginalized status.

To address these plights, AIIMS Deoghar has actively engaged with the Unnat Bharat Abhiyan Scheme by the Government of India. Our dedicated team works closely with 10 villages, five of which are tribal, conducting health assessments, offering medical consultations, and imparting comprehensive preventive health training. This encompasses hygiene, sanitation practices, and overall well-being.

Furthermore, recognizing the unique health needs of tribal communities, AIIMS Deoghar recently hosted the first national summit on tribal health. Over two days, 55 experts from across the country, specializing in tribal health, convened to discuss crucial aspects such as nutrition, health challenges, access, and suitable approaches. The Union Minister of Tribal Affairs, Arjun Munda, presided the event. He designated AIIMS Deoghar as a center of excellence for tribal health, reinforcing our commitment to this crucial cause.

This recognition has intensified our dedication. We have submitted approximately 18 research projects to the Ministry of Tribal Affairs, specifically addressing the health needs of tribal communities. One significant focus is hemoglobinopathies, including the prevalent sickle cell anemia, disproportionately affecting

tribal populations. As a designated nodal center, AIIMS Deoghar will spearhead the implementation of the national program on sickle cell anemia, working closely with the Ministry of Tribal Affairs.

These endeavors underline our unwavering commitment to tribal health since our inception. AIIMS Deoghar remains steadfast in its mission to contribute significantly to the well-being of tribal communities through dedicated research, practical initiatives, and specialized healthcare services.

**What are the challenges and benefits institutes like AIIMS might face in places such as Deoghar?**

AIIMS Deoghar began in September 2019, making it just three years old, while AIIMS Delhi was established in 1956, making it 65 years old. Although a direct comparison isn't appropriate due to the differing ages and circumstances of these institutions, there are distinct components – opportunities, and challenges.

Starting with opportunities, when launching a new endeavor, such as AIIMS Deoghar, having a clear vision and defined targets allows for focused and efficient progress.

This stands in contrast to AIIMS Delhi, which may encounter numerous obstacles and resistance when implementing plans. AIIMS Deoghar's focused approach leads to quicker and better achievements.

AIIMS Deoghar operates in an area that has previously lacked these medical facilities. Even small contributions can significantly impact the local community's health. Turning to challenges, newer AIIMS institutes, like Deoghar, often face difficulties due to their location in less-connected areas. Connectivity and access to education for faculty members and their families can pose obstacles. In AIIMS Deoghar's case, the establishment of a functional airport has improved connectivity.

These challenges, while present, provide an opportunity for growth and development. Facing and overcoming challenges in the early stages of one's career leads to greater maturity and preparedness for future efforts.

Further, AIIMS Deoghar visions a future where it plays a decisive role in addressing regional

health needs. As the institute ages over the next five to 10 years, it aims to contribute significantly to the community. AIIMS Deoghar focuses on its own unique opportunities and challenges. The absence of competition in Deoghar allows for impactful contributions and growth in ways that institutions in more established settings may not experience.


AIIMS Deoghar recognizes its distinct position as a young institute in a developing area. Challenges are viewed as opportunities for growth, and the institute remains committed to its vision of contributing meaningfully to the community's well-being.

**AIIMS Deoghar is a sixth-generation AIIMS. What are your key priorities for the institute over the next few years?**

Firstly, as a government institute, we receive good support and coordination from the Ministry of Health and Family Welfare. This includes oversight from the ministry's office and our secretary of health. They cooperatively monitor our project's progress, addressing challenges we encounter and offering guidance to overcome them.

The state government plays a pivotal role. AIIMS facilities are provided to state governments upon request, with the condition that they provide required land, water, electricity, and basic amenities. We are grateful to the Jharkhand government for embracing this opportunity and facilitating the establishment of AIIMS Deoghar. This strategic location addresses a significant lack of specialized medical services within a 200-kilometer radius.

AIIMS Deoghar's mandate extends beyond only treatment and diagnosis. It encompasses promoting health, preventing disease, treating ailments, and facilitating rehabilitation. Our commitment is to ensure every individual's journey, from birth to passing, is marked with dignity. We are committed to upholding this mandate, receiving invaluable support from the state government and its district administration.

Despite facing obstacles, we maintain close communication with the state government. While some anticipated measures were delayed, we strive to accelerate progress. The impact of the COVID-19 pandemic slowed our advancements, but we are diligently making up for lost time and remain aligned with our targets, crafted in consultation with the ministry. 



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VEENA KOHLI

# INDIAN START-UPS ARE NEEDED TO REDUCE DEPENDENCE ON IMPORTED MEDICAL DEVICES

Getting educated in two unconventional but potential courses of the medical stream, **Veena Kohli**, Founder and CEO, Vanguard Diagnostics, encourages start-ups in the MedTech sector. Kohli, the recipient of Start-up of the Year 2022 award by the Ministry of Chemicals and Fertilizers, Tells Education Post's **Tanay Kumar** that a convergence of diagnostic and pharmaceuticals is inevitable in the coming 25 years.

**You studied two unconventional courses from AIIMS, New Delhi: Bachelor's in Human Biology and Master's in Pharmacology. Please tell us about these two courses.**

Like a majority of students in the 12th standard with Biology as a subject, I had an objective to enter a medical school to pursue an MBBS course. I was, however, not obsessed with it. In our times, there was a common all India entrance exam for MBBS and Bachelor's in Human Biology at the All India



Institute of Medical Sciences (AIIMS), New Delhi, which I cleared successfully and decided to pursue it.

The first year of both the streams covered foundational subjects like Anatomy, Physiology and Biochemistry, providing us with the necessary foundation in medical sciences.

As the second year began, we were exposed to a diverse range of subjects such as Pathology, Microbiology, Pharmacology, Biophysics, Reproductive Biology and Biostatistics. These courses were carefully designed to prepare us to be high-quality scientists and researchers. While many of my peers chose paths in pure research, I found myself increasingly drawn to the drug industry and thus decided to specialize in Pharmacology during my third year.

To pursue my Master's in Pharmacology at AIIMS, I had to go through another all-India entrance exam. I was delighted to secure a seat in

Pharmacology. It took me a step closer to my ultimate goal. While at AIIMS, I always visualized myself working at the highly-reputed Ranbaxy Laboratories Limited – the very first Indian multinational pharmaceutical company.

Immediately, after completing my masters, I joined the diagnostics division of Ranbaxy at the time of its inception. I was entrusted with significant responsibilities, heading various key functions like R&D, Quality, Manufacturing, and Technical Services during my enriching 19-year tenure.

Subsequently, I received an opportunity to lead the India business as Vice President at Ranbaxy Fine Chemicals Limited (RFCL) and was able to demonstrate remarkable growth in business. In 2010, RFCL was acquired by an American company, and I was appointed as the Global Head and Vice President for the diagnostics business unit.

In this role, I strategized the business operations across the US, Europe, Asia, Africa, and South America, while leading a

diverse team of professionals from multinational and multicultural backgrounds. I believe that it is not a particular course or stream but one's passion and determination that ensure success in life.

**It boosts a woman's morale if she finds family support on her entrepreneurial journey. Please tell us about your family members and how was your mother's role in your journey?**

I grew up in a middle-class family where education held the utmost importance. At the age of nine, I was selected through an All India Merit Scholarship exam, which opened the doors for me to study at the renowned residential public school, Maharani Gayatri Devi Public School, Jaipur, without placing any financial burden on my family.

At a time when societal norms often prioritized marriage for girls, my mother stood apart. She firmly believed in the power of education and encouraged my sisters and me to complete our studies and achieve financial independence before contemplating marriage. Therefore, my mother played a very crucial role in shaping my perspective towards my career. Additionally, my brother, an IITian, has been a constant guide and mentor throughout my journey.



After getting married, I was fortunate to receive extraordinary and unconditional support from my husband and children throughout. My husband, a passionate professional himself, has been an unwavering pillar of strength, being my rock in times of challenges. My two children have also played a significant role, keeping me updated with the latest trends and technology, ensuring that I stay relevant and adaptable in the rapidly changing world.

**You chose the area of In-Vitro Diagnosis as your business domain. Please tell us some other areas where enthusiasts of biomedical/medical devices must keep an eye as per the country's needs.**

a) The COVID-19 pandemic ushered in many paradigm shifts in our lives. For instance, the shift towards online healthcare services, remote consulting and home delivery of medicines. This has set the stage for home-use diagnostics and Point of Care Tests (POCT).

These POCT/ home use tests can easily be supplied and used in rural and remote areas of the country as they:

- Do not require a laboratory set-up or skilled manpower
- They do not require electricity and can run on batteries





- A majority of them do not require special temperature conditions during transport and storage amongst other well-known advantages

Globally, the POCT/home-test kits have evolved and their applications have expanded significantly; ranging from a blood glucose test, initial screening for HIV, cancer and Alzheimer's to over-the-counter genetic testing kits.

The global market size of these diagnostics products is estimated to be ~ US\$ 15 Bn.

The consumption of home diagnostics in India, on the other hand is limited to pregnancy and blood glucose testing with ovulation testing gaining some ground during the past ten years. There is therefore an unmet need in the market for this segment of diagnostics products.

b) The future of the diagnostics industry lies in the development of more sensitive, faster, user-friendly, IT capable devices. Since diseases are now understood at a molecular level, we need to focus on

tests that can detect new proteins and molecular markers. Every drug known in the world produces therapeutic effects in 66% of the population, while the remaining 33 -34% of the consumers only suffer its side effects.

This is the fact on the basis of which the concept of companion diagnostics emerged, which aims to customise the treatment to be administered to each patient, depending upon the outcome of a novel diagnostics test, ensuring that the patient only benefits from the therapeutic effects of the drug with minimal side effects.

In healthcare, during the next 20 to 25 years there is likely to be a convergence of diagnostics and pharma for the addressal of every type of disease under the category of personalized medicine or pharmaco-diagnostics.

c) In addition, genomics and next generation DNA sequencing for a deeper genetic understanding of cancer and other diseases should fast be adopted into clinical diagnostics from pure research in our country.

**You led the Association of Diagnostics Manufacturers of India (ADMI) and we all are aware of the long existing industry-academia gap. So, are the industries averse towards bridging this gap? And if it is not true, how should colleges and education institutions pitch to the industries for collaboration?**

Necessity is the mother of invention – the significance of a successful industry academia linkage was well demonstrated and acknowledged by the Indian diagnostics industry and the academia alike, during the fight against the Covid pandemic.

We need to take a leaf from this experience and ensure that the industry continues to leverage the treasure-trove of technologies and expertise lying locked in the reputed academic institutes and research bodies of the country such as IITs, AIIMS, ICGB, CCMB, BIRAC, DBT and ICMR amongst many others.

The industry had suggested to the Govt. to generate structured platforms to facilitate the convergence and collaboration between the Industry and academia. It is very encouraging to see that this point finds a place in the National Medical Devices Policy 2023 of India.

**Through such collaborations, the industry can benefit in three major ways:**

1. To get easy access to technology
2. To make critical raw materials locally available
3. To foster skill development

By offering essential internship semesters for students in fields like Biomedical Engineering, Medical Microbiology, and Molecular Biology, the industry can nurture talent and provide students with valuable real-world experience. This, in turn, can encourage

The future of the diagnostics industry lies in the development of more sensitive, faster, user-friendly, IT capable devices. Since diseases are now understood at a molecular level, we need to focus on tests that can detect new proteins and molecular markers. Every drug known in the world produces therapeutic effects in 66% of the population, while the remaining 33 -34% of the consumers only suffer its side effects.

more students to consider a career in the industry, while also granting the industry access to qualified and skilled human resources.

**India needs more entrepreneurs in the MedTech sector – an arena of your deftness. Please tell us reasons why this sector is good for entrepreneurship and what are biggest challenges in this sector that entrepreneurs should be aware of?**

The Indian Medical Devices industry presents a compelling investment opportunity with a promising outlook for growth and potential in the coming decade.

**a. High growth potential:**

The impact of COVID-19 has significantly heightened awareness about health and wellness. Furthermore, the burden of chronic and lifestyle-related diseases such as Diabetes mellitus, cardiac disorders, and others is rapidly increasing. These factors, combined with the growing interest in health management, are projected to drive the market at an impressive growth rate of 20% over the next 10 years.

**b. Sunrise sector:**

The Indian government has recognized Medical Devices as a sunrise sector due to its rapid growth. As a result, the government has introduced various schemes and initiatives, including the Production Linked Incentive (PLI) scheme and the establishment of dedicated medical devices parks, to support and incentivize indigenous manufacturing.

In addition, the government is committed to fostering research and innovation in this sector through the Promotion of Research & Innovation in the Pharma MedTech (PRIP) sector plan, with an allocation of Rs. 5000 Crore over a

period of five years.

Entrepreneurs entering the medical devices industry at this stage can expect to receive significant support and impetus from the government.


**c. Need for new technologies:**

The post-Covid era has witnessed a rapid surge in new and emerging technologies within the medical devices sector. Technological shifts create opportunities for start-ups and new ventures, as existing large players may struggle to adapt swiftly to the changing landscape.

One of the major challenges the industry currently faces is its heavy dependence on imports, particularly in the instrumentation segment. Start-ups that can contribute to reducing this import dependence have great potential for success.

**Presently, the industry remains 80% reliant on imports due to various factors:**

- i. Non availability of technology in our country in this segment. Technology needs to be imported.
- ii. This coupled with negligible availability of components and spare parts required for the manufacturing of instruments, churns out a double whammy.
- iii. With the exception of a few components like boards and algorithms, all other components need to be imported with high import duties.

In conclusion, the Medical Devices industry is on the cusp of remarkable growth, driven by the increasing demand for advanced healthcare solutions, government support through various initiatives, and the potential for technological innovation. Entrepreneurs venturing into this space have an opportunity to play a vital role in shaping the future of healthcare and contributing to India's self-reliance in the medical technology sector. 



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# HANDS-ON EXPERIENCE WITH THE LATEST TECHNOLOGY IS ESSENTIAL FOR MEDICAL STUDENTS



**Shammi Gumbhir**, Founder-cum-Managing Director at Unicorn DenMart Ltd, cannot stress enough how essential it is for medical students to practice with the latest available technology. Gumbhir, who is also the Secretary at the Association of Dental Industry and Trade of India (ADITI), puts his viewpoints on the various aspects of dental education and industries in a conversation with Education Post's **Tanay Kumar**.

Always intrigued by challenges and driven by the prospect of making a difference, I made the decision to pivot towards this industry. My technical background has proved invaluable in understanding the mechanics of the dental equipment we deal with. My overarching aim has always been to bring the best of global dental equipment advancements to our local market.

The gap between the industry and academia of the Indian education system is obvious and industries often avert to take fresh graduates as they lack industry experience. What is the scenario when it comes to the dental equipment and instruments and the academics related to it?

Certainly, bridging the gap between academia and industry poses a significant challenge in many sectors in India, with the dental and medical equipment industry being no exception. From an academic perspective, engineering students mostly receive theoretical training on various subjects, often lacking exposure to advanced equipment and technologies currently in professional use. This situation can lead to a challenging transition for new graduates entering the workforce.

From an industry standpoint, the relentless development of innovative dental technology and equipment necessitates continuous learning, even for seasoned professionals. This ongoing evolution can be especially challenging for new graduates, who may not have been exposed to such advancements during their academic training.

However, there are multiple strategies to address these challenges. For instance, fostering partnerships between industry and educational institutions could ensure students gain hands-on experience with the latest equipment and technologies. While we see this collaboration happening in areas like IT, automobile, and various electronics manufacturing segments, it's still lagging in the medical equipment sector. That said, at Unicorn DenMart Ltd., we emphasize the importance of continuous learning and professional development, enabling our team to stay updated and proficient in handling new technology products and supporting existing ones.

We consider education for our users to be a pivotal part of our mission. We consistently

## You had done your graduation in electrical and electronics engineering. What made you to turn towards venturing into dental equipment business?

Indeed, my educational background is in electrical and electronics engineering. At first glance, this may seem quite distinct from the dental industry. However, I firmly believe that the underlying principles of problem-solving, innovation, and technical comprehension that I honed during my engineering studies have universal applicability across diverse industries.

When an opportunity to venture into dental equipment business presented itself, I recognized the potential to employ my skills within a new context. I observed that the dental industry, particularly in India, was ready for the integration of advanced technology and the enhancement of equipment to improve patient care and comfort. Moreover, I noticed a significant need for a broader selection of high-quality, reliable dental equipment in the Indian market.



strive to provide training and awareness for dental practitioners regarding the use and benefits of advanced dental equipment, ensuring they can deliver the best possible care to their patients.

### Unicorn DenMart has a strong workforce with both BDS+MDS and technical qualifications. What challenges arise when a dentist has to explain their needs for a device for dental equipments?

The intersection where healthcare meets technology is indeed fascinating. On one hand, we have dental professionals with BDS and MDS degrees who possess deep clinical knowledge and understand patient needs. On the other hand, we have engineers who are adept at designing and handling sophisticated dental equipment. Bridging the gap between these two disciplines can present certain challenges.

The primary challenge lies in effective communication. Dentists articulate their needs based on clinical experiences, patient interactions, and diagnostic considerations. They talk in terms of dental procedures, patient comfort, and treatment outcomes. In contrast, the engineering team thinks in terms of specifications, functionality, and the technical constraints of a device. Thus, translating the dentist's needs into a language that engineers can understand and implement is crucial, and often a challenging task.

Another challenge arises from the differing perspectives on what constitutes a 'good' device. For a dentist, a good device is user-friendly, reliable, and enhances patient comfort and treatment outcomes. For an engineer, it's about technical superiority, innovation, and precision. Aligning these perspectives to create

devices that satisfy both parties is another significant hurdle.

At Unicorn DenMart, we address these challenges through close collaboration. Our teams are multidisciplinary, encompassing a mix of clinical and technical expertise. This diversity enables effective communication and mutual understanding, which in turn facilitates the development of dental equipment that truly meets the needs of dental practitioners and improves patient care.

### In 2020, Unicorn DenMart launched Sculpt3d, a platform to provide 3D Printing solutions in the dental care of the country. Please tell us something about this platform and how 3D printing can change the dental care sector in the future?

Sculpt3d, one of our most ambitious initiatives at Unicorn DenMart, is a platform designed to bring 3D printing technology to the forefront of dental care in India. The primary objective of Sculpt3d is to revolutionize dental procedures, making them more precise, efficient, and customizable.

3D printing, or additive manufacturing, possesses the potential to transform numerous aspects of dental care. It enables dental professionals to create highly accurate dental models for diagnostic purposes, and even produce custom dental prosthetics, such as crowns, bridges, and orthodontic aligners. The precision offered by 3D printing ensures a superior fit and improved patient comfort, reducing the number of visits and adjustments required.

Moreover, 3D printing can dramatically accelerate dental

laboratory procedures. Traditional methods can take days or even weeks to fabricate dental prosthetics, whereas 3D printing can achieve the same results in a matter of hours. This increase in productivity not only benefits dental practices but also significantly reduces the waiting time for patients.

Sculpt3d aims to make these advantages accessible to dental practitioners across India. Through this platform, we offer a variety of 3D printing solutions and services, ranging from providing 3D printers suitable for dental applications, to offering training and support to help practitioners integrate this technology into their practices. We firmly believe that 3D printing represents the future of dentistry, and we are committed to leading the way in this exciting area.

### As an industry veteran, what challenges do you observe that dentists and dental students are facing today in India?

In my experience, several challenges are currently facing dentists and dental students in India.

Firstly, there is a significant lack of practical exposure to advanced dental technologies and procedures. Many dental students graduate with an emphasis on theoretical aspects, but without sufficient hands-on experience with the latest equipment and technology. This gap can hinder their ability to provide optimal care when they enter the profession.

Secondly, numerous regions in India, particularly rural areas, are grappling with inadequate dental care facilities. This disparity in access to quality dental care between urban and rural regions is a substantial issue that necessitates attention.

Lastly, financial barriers often pose challenges. High-quality dental equipment can be costly, which might prevent some clinics from offering the best possible treatments.

At Unicorn DenMart, we strive to

address these challenges in various ways. We are dedicated to bringing world-class dental equipment to India at affordable prices. We provide comprehensive training to help practitioners effectively use this equipment, and we are continually innovating to meet the evolving needs of the dental industry.

### Being the secretary of the Association of Dental Industry and Trade of India, please tell us what is lacking in the dental care industry that needs immediate attention?

As the Secretary of the Association of Dental Industry and Trade of India, I've had the privilege of acquiring a comprehensive understanding of our industry. In my view, there are three primary areas that require immediate attention:


#### Public Awareness of Oral Health:

Despite substantial efforts, the awareness about the importance of oral health remains relatively low in many parts of India. We need to conduct comprehensive campaigns to educate the public about the importance of regular dental check-ups and good oral hygiene practices. This should be a joint effort involving Government Departments, the Indian Dental Association, and ADITI.

**Infrastructure Development:** A number of regions in India, particularly rural and underprivileged areas, still lack sufficient dental care infrastructure. Establishing dental clinics and care centers in these areas is a critical first step towards improving oral health nationwide.

#### Technology Adoption and Education:

The global dental industry is continuously evolving with new technologies and procedures being developed regularly. Indian dentists need better access to these advancements, as well as necessary training to use them effectively. We need to encourage and support wider adoption of digital dentistry, from digital imaging to CAD/CAM and 3D printing.

By focusing our attention on these areas, I believe we can make significant strides in improving dental care across India. 

# IIRF

## ANNUAL EDUCATION IMPACT AWARDS & CONFERENCE - 2023



October 18, 2023  
(9.00 AM to 5.00 PM)

The Ashok  
Chanakyapuri, New Delhi

## AWARDS FOR TOP RANKERS

### ABOUT IIRF

Indian Institutional Ranking Framework (IIRF) ranks more than 1,000 institutions (300+ Universities, 350 Engineering colleges, 150+ B-Schools, 50 Law colleges, 50 Design schools, 50 Architecture colleges and 100+ Undergraduate colleges for BBA & BCA) across the country.

IIRF is presented and published by EDUCATION POST, a monthly magazine on higher education since 2012. FEDERATION FOR WORLD ACADEMICS (FWA) guides the methodology and industrial feedback and plays the role of Mentor for IIRF Centre for Institutional Research (ICIR) in India. The IIRF ranking is based on concrete analysis by the experts and stands as the most diverse and authentic ranking in India accepted by corporate world.

### IIRF TOP RANKERS AWARD

#### Eligibility

Ranked in Top 10 in any level (National, Zonal or State) in any category (University, Engineering, Management, Architecture, Law, Design, Medicine, Nursing, Pharmacy, Dental, Journalism and others).

#### Award Categories

- Rank Specific

### IIRF EDUCATION IMPACT AWARD

#### Eligibility

Educational Institutions, Corporate and NGOs working in the domain of Education, irrespective of IIRF's list are eligible to participate.

#### Award Categories

- Innovation • Academic Excellence • Research • Employability • Industry Interface
- Global Outlook • Multi-disciplinary Streams • Industry-linked Courses • Entrepreneurship
- Global-Interface • Green Campus • Global Exposure

### CONFERENCE

- Session-I** : Ranking and Accreditation
- Session-II** : Education and its Social Impact
- Session-III** : Industry Academia Integration

**T&C** : IIRF has sole authority to invite or not to invite the IIRF Rankers of 2023 Rankings.

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DR. UMESH SHARMA

# VETERINARY SCIENCE DESPERATELY NEEDS GOOD INFRASTRUCTURE, LABS

**Dr. Umesh Sharma**, Chairman of the Veterinary Council of India (VCI), urges students to opt for the Bachelor of Veterinary Science course and study it with full conviction as animals and birds deserve good doctors just as much as humans. He also informs Education Post's **Tanay Kumar** about the newly launched VCI portal which will greatly help those in this profession.

**This year, on the occasion of World Veterinary Day 2023, Parshottam Rupala, Union Minister of Fisheries, Animal Husbandry and Dairy, launched the VCI Portal. How will this portal help veterinary doctors?**

The portal was launched for a bigger and efficient cause to have a kind of one-platform-solution for veterinary doctors in India. Many states have different criteria to accredit veterinary doctors in our country. For example, some states register the veterinary doctors via online methods, while some do it offline.

Further, just like doctors of human physiology do in different body parts, example ear, lungs, liver, kidney and many more. Similarly, it would be really beneficial for the country to have a single portal where we could know which doctor has done specialization or Ph.D. in which animal.

Further, geographical mapping of those veterinary doctors around the country is also another ambition of this portal. For example, it would show that in this particular locality, area of the country, these are the veterinary doctors who have done specialization in these animals. It would really help the common citizen to get the doctors easily in their area.

And, the portal aims to bring all the colleges of veterinary at a single window where they could register their institutions and the professors' specialization, which would further help the students of veterinary science. Further, there was not a very robust and efficient window of information of veterinary hospitals. So, this portal would further address this situation.

**There are lots of discourses around increasing the duration of the study of veterinary science. What are your viewpoints on this issue?**

When I was the VCI Chairman back in 2016, I wanted to make it 5.5 years and dedicate a separate six months internship in

**When did you come to know about veterinary science and what was your motivation behind opting for this subject?**

I belong to a family of farmers from Bhind district of Madhya Pradesh and one knows that any farmer in India, usually, at large, has a couple of bullocks or cows or buffalos. So, my belonging and upbringing have been from that background and it really made a good influence on me. Further, even if one reads our sacred scriptures, like Shrimad Bhagvadgeeta, Lord Krishna has said that I live in every living creature of this world.

Further, we cure those who can speak about their ailments and problems, but what about those who can't make humans understand about their disease? So, being a veterinary doctor is a very noble profession in my view. I had watched my parents, Shiv Narayan Sharma and Shakuntala Sharma, took care of our cattle. In a normal farmer family, cattle are a crucial part of their livelihood. So, my surroundings really made a noble impression on me.



the course. Second, the internship used to be at the state level and we enhanced its ambit for the national level. I firmly believe that students must be aware of the specialities of the veterinary science of the whole country, that is, which state has large number of a particular animal, or which state has a lesser number.

Further, we have made a proper standard model that a student has to complete his internship for at least three months in villages as we all know that villages possess the lion's share of the cattle and other pet animals. In European countries, the duration to have specialization in veterinary science is usually eight to nine years.

And the study of veterinary science entails a student to study many animals and not to forget, every animal has its own physiology and biology, example the physiology of a dog is totally different than a cat, if I take a very commonly available example, while there are way more than just

these two. In the future, we will introduce diploma studies dedicated to different animals and streams, aiming to enhance the knowledge and research of veterinary doctors in India.

**Low stipend is paid to veterinary researchers, compared to MBBS and other medical researchers. What are the viewpoints of VCI on this issue and what are the steps VCI is taking to fix this discrimination?**

VCI has requested in written to every state government to endow the stipend of veterinary doctors equal to medical and other doctors. And, thanks to the Supreme Court that it gave the verdict in this favor that a veterinary researcher should get

equal stipend to a medical or MBBS doctor.

Most of the states have started paying the stipend in that amount, and we are constantly in process to convince other states that they also pay equal stipend to the veterinary researchers. I am sure that in the coming six months, there will be uniformity in the stipend of a veterinary researcher and a medical researcher.

**Issue of permanency of contractual mobile veterinary doctors is still an issue among many veterinary doctors and even those who are studying B.V.Sc. What are your views on this issue?**

I will commend the government of India to introduce a policy on mobile veterinary doctors. See, a buffalo, a cow, a horse, a bullock and many other animals are really heavy to transport to any hospital. So, it's way easier to have a mobile veterinary doctor at the site than transporting a big animal, which most of the times, farmers are not able to either afford.

The responsibility of workforce and their permanency or contractual employment depends upon the state governments. Some states even hired some agencies to operate those mobile veterinary medical care. In fact, the government of India has proposed that those mobile veterinary doctors would get around Rs. 55,000 per month. Now, this responsibility lies on the state governments to implement and work on these rules.

VCI believes that this whole process and rule should be implemented so that students of veterinary science could do more service to the nation. In Madhya Pradesh, the state government has taken the entire responsibility and it has been running a better course.

**After COVID-19, discourse and debates on zoonotic diseases have scaled up. Your take?**

Before answering this, I would bring it to light that even before the creation of the World Health Organization in 1945; World Animal Health Organization was set up in 1924.

It shows that scientists were concerned even then for zoonotic diseases. Many of the diseases that we humans get, are zoonotic.

Now, coming to the question, in this regard, infrastructure is very important, combined with proper diagnostic laboratories and adequate surveillance facilities. Along with that, the morphology of those diseases and coordination with human physiology are very important. So, this must be addressed first. There are standards and regulations for veterinary practitioners and they should be followed properly. How will a vaccine for any zoonotic disease be devised if there are no labs and workforce?

Proper and timely utilization of funds is another very critical thing to pay attention. Recently, five Indian states have received some projects from the World Bank Group. Building necessary infrastructure is going to be the key issue of those projects. Building both the capacity and the capability of the workforce is indispensable.

**What would be your message to colleges that are offering B.V.Sc. and students who are studying this subject?**

I would urge the students to study this course with your full conviction and integrity. It is hard, but hard work surely and inevitably pays one day. Plus, your knowledge will save lives of those who can't speak for themselves. So, if you study with your full conviction, it will save lives and it is a very noble profession.

Colleges, first of all, must bring together their students and those who are doing great in this field, to make them engage in a conversation and discourse, whether they are in the veterinary or other departments like forest, animal husbandry, environment etc. Bringing them together in conversation will surely inspire the students to keep on doing good work. 📧



# WHERE IS INDIAN PEDAGOGY HEADED?

Pedagogy in India is at a critical juncture, with ever-evolving technology being the driving force behind the sea-change that teaching and learning is undergoing. But it is an ongoing process, still far from an ideal situation. Education Post's Managing Editor **Rohit Wadhwaney** interviews **Sushma Raturi (SR)** of the Saamarthya Teachers Training Academy of Research (STTAR) and **Rishabh Khanna (RK)** of teacher-training platform Suraasa to understand the past, present and future of the educationist in the country.

## Academics say that a severe shortage of teachers is the biggest hurdle in implementing the National Education Policy (NEP) 2020. Do you agree? Is there in fact a shortage of teachers in India?

SR: According to recent UNESCO report, there is a shortage of over one million teachers in schools. Around 1.1 lakh schools in India are single-teacher entities. A total of 19%, or 11.16 lakh teaching positions in schools, lie vacant and in rural areas, the number is as high as 69%.

During my visits to government schools in certain rural areas of the country, I noticed a shortage of teachers. Conversely, teachers in private schools appeared to be handling an overwhelming workload.

Shortages of teachers could be one of the factors that may pose a challenge in implementing NEP 2020, however there are other reasons such as:

- Resistance to change from stakeholders in the education system
- Aligning the existing education system with the new policy framework
- Challenges in ensuring effective teacher

trainings and PDPs to support the new policy requirements.

**RK:** Absolutely! There is definitely a shortage of teachers in India, but it's not just about the quantity. The main issue is the shortage of qualified and skilled teachers. We need teachers who have the right qualifications and know effective teaching techniques to shape the future of the country. So, it's not just a matter of having more teachers, but having the right ones.

This shortage of qualified teachers has been a problem in the Indian education system for a long time. To give you an idea, by 2030, India will need around 7 million teachers across different levels of education.

Now, let's talk about how this shortage affects the implementation of the NEP 2020. The NEP aims to bring about a significant transformation in the education system, focusing on skill-based education, innovative teaching methods, and personalized learning. However, without a sufficient number of qualified teachers, it becomes difficult to ensure the quality and delivery of education as envisioned in the NEP.

Furthermore, the policy emphasizes the importance of continuous professional development for teachers. It encourages their upskilling and reskilling to keep up with evolving teaching methodologies. However, implementing such training programs on a large scale poses a significant challenge in the face of the teacher shortage.

That said, efforts are being made by policymakers, educational institutions, and private players to address this shortage. They are establishing new teacher training institutions, expanding existing ones, and encouraging more young people to consider teaching as a career.

So, while the NEP 2020 is well-designed, its success ultimately depends on proper implementation, analysis, and the collective efforts of organizations like Suraasa, along with policymakers, educational institutions, and other stakeholders. It's an ongoing process, but with dedicated efforts, we can overcome the shortage of qualified teachers and provide quality education to our students.





**CA:** There is no doubt that the teacher shortage has been an ongoing issue in India, and this could pose a significant challenge to the implementation of the NEP 2020. According to a report from the Ministry of Human Resource Development (MHRD) in 2020, India had a shortage of approximately one million teachers at that time. It's also important to note that the issue is not just about the number of teachers, but also the quality of teaching, with concerns raised about teacher training, qualifications, and retention.

The NEP 2020 is an ambitious plan to overhaul India's education system, with aims to increase access to quality education, promote multilingualism, introduce a new pedagogical structure, and increase the focus on skill development. These are significant changes that will require a highly trained and adaptable teaching workforce.

That said, whether the teacher shortage is the "biggest hurdle" is debatable. While it's certainly a major challenge, other factors could also pose significant difficulties. For example,

there are infrastructural challenges, such as ensuring access to education in rural areas, that the policy will need to overcome. Furthermore, budgetary constraints, societal attitudes towards education, and regulatory challenges in implementing such a broad policy reform could also be considered substantial hurdles.

### What are the reasons behind this shortage of teachers in a massively populous country like India?

**SR:** In my opinion, the public perception and regard towards the teaching profession is one of the main reasons that can be attributed to its decline. Some other reasons are:

- Limited availability of qualified and trained teachers, particularly in rural areas
- High attrition rates due to low salaries and poor working conditions
- Insufficient investments in teacher development programs

- Limited opportunities for career growth and advancements in the teaching profession
- Lack of incentives to attract and retain quality teachers

**RK:** The shortage of teachers can be attributed to several factors. One major reason is the rapid population growth. With a large and growing population, the demand for quality education has skyrocketed. However, the rate at which new teachers are being trained and recruited hasn't kept up with this demand.

Another factor is the limited number of teacher training institutions. While efforts have been made to establish more of these institutions, there is still a gap between the supply of qualified teachers and the number needed to meet the demand.

Moreover, teaching is not always seen as an attractive profession compared to other career options. Some perceive it as financially unrewarding or lacking prestige. This perception discourages talented individuals from pursuing teaching, worsening the shortage of qualified teachers. There are also regional disparities in the distribution of teachers. Many qualified teachers prefer to work in urban areas or more developed regions, leaving rural and remote areas with a significant shortage of teachers.

Furthermore, in some educational systems, teachers face challenges such as comparatively lower salaries, limited avenues for career advancement, and a lack of adequate support. These challenges contribute to high attrition rates among teachers, further worsening the shortage. It is crucial to address these issues within the affected systems and regions, implementing policies and reforms that prioritize fair compensation, improved career prospects, and a supportive working environment for teachers.

So, you see, the shortage of teachers in India is a complex issue stemming from variable factors, not just one particular issue.

**CA:** The shortage of teachers in a massively populous country like India can be attributed to several reasons. Here are some key factors that contribute to this issue:

**Population pressure:** India has a population of over 1.4 billion people, and the demand for quality education is immense. The sheer size of the population puts significant strain on the education

system, making it challenging to recruit and retain an adequate number of qualified teachers to meet the growing demand.

**Education infrastructure:** Despite progress in recent years, India still faces challenges in providing sufficient educational infrastructure, particularly in rural areas. Many schools lack proper facilities, including classrooms, libraries, and laboratories, which makes teaching positions less attractive to potential candidates.

**Inequality in access to education:** There are significant disparities in access to education across different regions and socio-economic backgrounds in India. Many remote and economically disadvantaged areas struggle to attract and retain teachers due to the lack of basic amenities, inadequate transportation, and limited career advancement opportunities.

**Low teacher salaries:** In India, teacher salaries, particularly in government schools, are often low compared to other professions requiring similar qualifications. This wage disparity can discourage talented individuals from pursuing a teaching career and lead to attrition, further exacerbating the shortage of teachers.

**High student-teacher ratio:** India's education system often faces a high student-teacher ratio, especially in government schools. This means that teachers are burdened with large class sizes, making it difficult for them to provide individual attention to each student. The workload and lack of support can lead to burnout and demotivation among teachers.

**Lack of teacher training and professional development:** Adequate training and continuous professional development opportunities are essential for teachers to enhance their skills and keep up with evolving teaching methods. However, in India, there is a shortage of quality teacher training institutes and comprehensive professional development programs, limiting the growth and effectiveness of teachers.

### Do you see this shortage being filled in the near future? Is there an improvement in the situation in sight?

**SR:** There have been some initiatives to improve the situation, it being a complex issue, filling the shortage will take quite some time.

It is possible to overcome the shortage of teachers in the near future through sustained investment, systemic reforms and effective policies. However, there have been a positive focus towards teacher education programs that are aligned with the needs of the current education scenario and the demands of the job market.

**RK:** Yes, definitely! We see a positive outlook for filling the shortage of qualified teachers in the near future.

For instance, the government has established the National Initiative for School Heads' and Teachers' Holistic Advancement (NISHTHA) program. This program aims to provide continuous professional development and training to over 42 lakhs (4.2 million) teachers across the country, enhancing their skills and knowledge. This will allow unskilled teachers to become more skilled, grab better opportunities and make a more lasting impact on the education system.

Furthermore, the implementation of the NEP 2020 has placed a strong emphasis on teacher training and professional development. The policy envisions the establishment of the National Professional Standards for Teachers (NPST) to ensure that teachers are equipped with the necessary skills and knowledge for effective pedagogy.

While filling the shortage entirely may take time, the collaborative focus on addressing this issue gives us optimism that the shortage of teachers in India will be mitigated in the near future. Together, we can provide quality education and shape a brighter future for our nation.

**CA:** Several initiatives and policies are being implemented to address these issues, such as the new NEP 2020, which proposed significant changes in the prevailing Indian education system, including teacher training and recruitment. Other efforts included increasing the use of technology in education, expanding distance and online learning options for teacher training, and providing better support and incentives for teachers working in rural or underserved areas.

However, the effectiveness of these measures and their ability to significantly reduce the teacher shortage in the near future would depend on a variety of factors, including the successful implementation of these policies, changes in socio-economic conditions, and the evolving impact of the COVID-19 pandemic on the education system.

## How would you compare teaching methods in the 1980s or 1990s to teaching methods today? Ways of imparting education seem very progress today as compared to, say, 20-30 years back.

**SR:** Urban schools have undergone a significant transformation in their pedagogical practices in the last three decades, although they are at varying stage of development. While some schools may be making slow progress, others have made remarkable strides in adopting global best practices and are on par with some of the best schools in the world. However, the situation is quite dismal in rural schools, where there is not much evidence of progress in their curricular transactions.

**RK:** Absolutely! Teaching methods today have come a long way compared to the 1980s or 1990s. Back then, it was all about rote learning, textbooks, and listening to chalkboard lectures. Students were mostly passive recipients of information, and there weren't many interactive or multimedia resources available to make learning engaging

But fast forward to today, teaching methods have undergone a remarkable transformation. With advancements in technology and a better understanding of effective pedagogy, education has become more student-centered, interactive, and inclusive. Teachers now have a plethora of tools and resources at their disposal to create dynamic learning experiences.

Instead of just being the bearers of knowledge, teachers now play the role of facilitators. They guide students in exploring and understanding concepts, encouraging them to actively participate in the learning process. Collaborative learning, critical thinking, and problem-solving are given more prominence. Students engage in group discussions, hands-on activities, projects, simulations, and even educational games to make learning fun and practical.

Technology has played a major role in this shift. It has opened up a world of possibilities in education. With the advent of digital platforms, online resources, and interactive tools, teachers can personalize learning experiences and provide instant feedback. Learning is no longer confined to the classroom, as remote learning has become more accessible, offering flexibility and expanding educational opportunities.

All-in-all education has become more inclusive, collaborative, progressive and interactive than ever before.



**CA:** In the 1980s and 1990s, Indian education was largely teacher-centric and based on rote memorization. The focus was mostly on imparting theoretical knowledge, with less emphasis on practical applications. Standardized tests were the primary method of evaluation, and there was less attention to individual student's learning style or interests.

Classroom infrastructure was generally basic, with a blackboard and chalk being the primary teaching aids. Technology was not a significant part of the classroom experience. Extracurricular activities were present but not heavily emphasized.

In contrast, by the 2020s, India had begun to adopt more progressive methods of education, inspired by global trends. Here are some key changes:

**Technological Integration:** With the advent of digital learning tools, technology has become an integral part of education. Online learning platforms, virtual classrooms, educational apps, and digital content are now widely used. This was further accelerated by the COVID-19 pandemic, which necessitated remote learning.

**Student-Centric Learning:** Education has become more student-centric, with a greater focus on understanding individual learning styles, interests, and capabilities. There is increased emphasis on critical thinking, problem-solving, and creativity instead of rote

learning.

**Holistic Development:** There's also a growing awareness of the importance of holistic development. Hence, extracurricular activities, sports, arts, and emotional intelligence are getting more attention in the curriculum.

**Skill-Based Learning:** Recognizing the importance of practical skills for employability, there's an increasing focus on skill-based and vocational education.

**Inclusion and Equity:** Efforts are being made to ensure greater inclusion and equity in education, addressing the diverse needs of students from various socio-economic, cultural, and linguistic backgrounds.

## Going forward, how do you see Indian pedagogy changing?

**SR:** Going forward, Indian pedagogy is likely to undergo significant changes as NEP 2020 seeks to transform the current education system and make it more holistic, flexible and student centered. Some of the key emphasis being laid by this progressive policy are:

- Integration of technology and digital tools into the curriculum
- Focus on developing 21st Century skills



- Greater emphasis on Student agency
- Increased flexibility in curriculum design and assessment methods

According to me, the future of Indian pedagogy is expected to be influenced by various factors, such as technological advancements, evolving societal needs and global trends in education.

**RK:** Looking ahead, we anticipate Indian pedagogy to undergo significant changes. The evolving landscape of education, advancements in technology, and the goals outlined in the NEP 2020 are expected to shape the future of Indian pedagogy.

One key shift that I envision is a greater emphasis on skill development and competency-based education, moving away from a content-centric approach. Critical thinking, problem solving, creativity, communication, and collaboration skills will be prioritized to equip students with practical capabilities.

The integration of technology into the classroom will become more prevalent, with digital resources, online platforms, and educational tools enhancing teaching and learning experiences. Blended learning models, combining traditional instruction with online components, will gain momentum, providing flexibility and expanding access to education.

These changes will foster well-rounded individuals equipped with the necessary skills and competencies to thrive in an increasingly interconnected world.

**CA:** Indian pedagogy is on the cusp of a transformative period marked by several exciting trends:

**Technology-Driven Learning:** The COVID-19 pandemic accelerated the transition to digital learning in India, and it is expected to continue its upward trajectory. We will see more

of online classes, digital textbooks, and tech-based learning platforms. Educational technologies like AI, VR/AR, and machine learning will make learning more interactive, personalized, and accessible.

**Personalized Learning:** With adaptive learning technologies, we can expect a move towards more personalized education that adapts to each student's learning pace and style. This approach will ensure that no student is left behind and that each student can maximize their potential.

**Skill-Based Education:** There is an increasing awareness about the need for skill-based rather than rote learning in India. This will lead to more vocational training and hands-on practical learning to better equip students for the future job market.

**Inclusion of Socio-Emotional Learning (SEL):** Emphasizing skills like empathy, emotional management, and social interaction is a trend expected to grow. This holistic education approach will equip students to deal with real-world challenges.

**Interdisciplinary Approach:** We can anticipate a shift from a rigid, siloed approach to a more interdisciplinary learning style that encourages critical thinking, creativity, and problem-solving skills.

**Focus on Sustainability:** As environmental consciousness grows, sustainability is becoming a more integrated part of the curriculum. Education will aim to foster a generation of eco-conscious citizens.

**Q** How will the emergence of new technology (artificial intelligence for example) impact teaching methods, positively and/or negatively?

**SR:** In my opinion, the impact of AI on the education system will be both positive as well as negative. The positive impacts are as follows:

- It will offer greater flexibility in teaching and learning process that will provide more scope for creativity and innovation
- Increased opportunities for personalised learning
- Improved assessments that will provide more accurate and timely feedback
- Improved learning outcomes and increased engagement and motivation through immersive technologies
- Easy access to good quality educational resources
- Effective and efficient use of teacher time and resources

However, there are potential negative impacts of AI on teaching and learning. They are:

- Heavy dependence on technology leading to diminished critical thinking and problem-solving skills
- Increased distraction and lack of human connection and psychological well-being of students
- Data loss, plagiarism and cyber safety issues etc

However, the impact of AI will depend on how it is used and implemented. With careful planning, investment and ethical considerations, AI will revolutionize education in a positive way. It is important to ensure that it complements rather than replace human teachers!

**RK:** The emergence of new technologies is expected to have a profound impact on teaching methods, presenting both positive and negative aspects.

On the positive side, technology can greatly enhance teaching methods by providing access to a vast array of digital resources, multimedia content, and online platforms. Teachers can leverage these resources to create more engaging and interactive lessons, catering to diverse learning styles. Visual aids, simulations, educational games, and virtual reality experiences can bring concepts to life and make learning more exciting.

However, there are also potential drawbacks to consider. Dependence on technology may lead to a reduction in human interaction and personalized attention. Some argue that the role of a teacher in

fostering social-emotional skills, mentorship, and building relationships with students may be compromised in a technology-driven environment.

Furthermore, the ethical implications of technology in education must be carefully considered. Issues such as data privacy, algorithmic bias, and equitable access to technology can arise and need to be addressed to ensure fairness and inclusivity in educational settings.

Ultimately, the impact of technology will depend on how it is integrated and utilized. Striking a balance is the key.

**CA:** The emergence of new technology such as artificial intelligence (AI) is transforming education in significant ways, providing both benefits and challenges.

**ChatGPT:** The emergence of new technology, such as artificial intelligence (AI), is expected to have significant implications for teaching methods in India and globally. The impact could be both positive and negative:


### Positive Impacts:

**Personalized Learning:** AI can make education more personalized and adaptive. It can help in understanding the learning patterns and capabilities of students, providing them with personalized study materials, and adapting teaching methods according to their needs.

**Intelligent Tutoring:** AI-powered tutoring systems can provide individual students with immediate feedback, answer their doubts, and explain complex concepts effectively. They can serve as a supplement to classroom teaching.

**Efficient Administrative Tasks:** AI can automate numerous administrative tasks such as grading, attendance tracking, and scheduling. This will allow teachers to spend more time on teaching and interacting with students.

**Access to Quality Education:** With the help of AI, high-quality learning resources can be made accessible to students in remote or rural areas. Online learning platforms, virtual classrooms, and digital content can bridge the gap between urban and rural education.

**Real-time Monitoring and Analytics:** AI-powered systems can provide real-time monitoring of students' performance and suggest improvements based on analyzed data. 

### Negative Impacts:

**Digital Divide:** While AI has the potential to democratize education, there's a risk that it could widen the digital divide. Students with limited access to technology or unreliable internet connections, which are quite common in some parts of India, may be left behind.

**Data Privacy and Security:** AI systems require vast amounts of data to function effectively. This raises concerns about the privacy and security of students' data.

**Teacher-Student Relationship:** While AI can take over certain tasks, it cannot replace the emotional intelligence and human connection that teachers provide. Over-reliance on AI could impact the teacher-student relationship negatively.

**Job Displacement:** There are fears that AI could potentially replace teachers. However, it's more likely that the role of the teacher will shift to one of a facilitator or guide.

**Quality and Bias:** AI is dependent on the data it's trained on. If the data is biased or of poor quality, the AI's recommendations and teachings will be too.

For India to fully benefit from the potential of AI in education, it is necessary to overcome infrastructural challenges, invest in high-quality digital resources, provide adequate teacher training, and establish robust data privacy and security policies. Furthermore, it's crucial to ensure that AI is used as a tool to assist teachers, not replace them, and that all students have equal access to these technologies.

### In your opinion, is the future of Indian education bright?

**SR:** Yes, very much so. If the NEP 2020 is implemented effectively and followed appropriately, the future of education in India appears to be very promising with the policy's futuristic approach.

With sustained efforts and investment, it is possible to build a world class education system that prepares students to be future ready with necessary skills to thrive in the international economy while simultaneously fostering social and economic growth

**RK:** Yes, the future of Indian education is bright. With ongoing reforms and technology, the system is poised to provide quality education, empower students, and prepare them for the challenges and opportunities

of the future. Efforts towards bridging educational gaps, promoting teacher upskilling, and fostering a learner-centric approach are paving the way for a transformative and inclusive education system that will benefit generations to come.

**CA:** The future of Indian education has potential to be bright based on several factors, although it depends on continued development and addressing certain challenges.

**Digitalization and E-Learning:** The advancement of technology and increase in internet penetration in India has opened up new avenues in the field of education. With the rise of e-learning platforms, students from all over the country can access quality education, regardless of their geographical location.

**Government Initiatives:** The government of India has launched several initiatives to improve the quality of education in the country. For example, the 'New Education Policy 2020' aims to overhaul the education system, focus on experiential learning, and encourage critical thinking.


**Increasing Investment in Education:** There has been a growing interest and investment in the Indian education sector, both from private players and from the government. This can lead to improved infrastructure, quality of teaching, and educational resources.

However, there are certain challenges that need to be addressed:

**Rural-Urban Divide:** Despite advancements, there is a substantial gap in the quality of education and resources available in urban and rural areas. Bridging this gap is essential for a brighter future.

**Quality of Education:** While access to education has improved over the years, the quality of education, especially in public schools, needs to be improved.

**Teacher Training:** Lack of well-trained teachers can hinder the progress of the education sector. Therefore, improving teacher training programs is crucial.

In conclusion, while the potential for a bright future in Indian education exists due to technological advancements, governmental policy, and increased investment, challenges remain that need to be addressed to fully realize this potential. 

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# UNRAVELING OCEAN OF OPPORTUNITIES WITH PH.D. IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

**MASOOM KHARE**  
Special Correspondent, Education Post

In an ever-evolving world, Artificial Intelligence (AI) and Machine Learning (ML) have emerged as the guiding force behind transformative technological breakthroughs. It's a revolutionary feat of computer science that has emerged as the core component of ground-breaking innovation in creating modern intelligent machines that can perform tasks that require human intelligence. ML, a subset of AI, is dedicated to enable machines to learn from data and improve their performance to perform tasks and make informed decisions.

From the virtual assistants that help us navigate our daily routing work to the personalized recommendation systems that curate our entertainment choices, AI and ML have transformed how we interact with technology and each other. The unprecedented growth of these fields has not only ignited a wave of exciting and rewarding career possibilities but also sparked a surge in demand for AI and ML experts who can unlock its full potential across various industries, and a Ph.D. graduate with in-depth knowledge of theoretical and practical application of these cutting-edge technologies can play a pivotal role.

Going ahead in this article, we will explore the different facets related to Ph.D. studies in AI & Machine Learning ML. We will explore the

reasons for considering a Ph.D. in AI and ML, the qualifications required for Ph.D. programs, the exciting branches one can specialize in, the trending research spheres, avenues for financial support, and the exciting career prospects that open up after successfully earning a Ph.D. degree in AI and ML.

## Why a Ph.D. in AI and ML?

The constant technological advancement in different AI sub-sectors, like machine learning and deep learning, is making the technology smarter and revolutionizing different aspects of businesses today, from operations to decision-making processes, and customer experiences. As a result, there is a great demand for skilled AI professionals who have the expertise to leverage it's potential across different sectors. In order to cater and meet the market requirement, many top colleges in India are offering Ph.D. programs in AI & ML. It is an advanced research-intensive program that not only helps students further their education and gain in-depth knowledge in the technological breakthroughs like AI and ML, but also provides a gateway to impactful research, career advancement and opportunities to shape the future of this innovative technology.

There are several compelling reasons to consider pursuing a Ph.D. in AI and ML.

## 1 Research Potential

Ph.D. studies gives an opportunity to involve in-depth research to develop innovative algorithms, ground-breaking studies and explore new applications of AI & ML

## 2 Career Advancement

The demand for AI experts is high& it unlocks diverse career paths from academic & industry research roles to leadership positions in tech firms for you.

## 3 Intellectual Enrichment

It offers a stimulating intellectual environment where you can engage, collaborate, and immerse yourself in the latest advancements in AI & ML

## 4 Impactful Contributions

Through your Ph.D. research, you can contribute to solving real-world problems, improving existing technologies, and shaping the future of AI and ML

## Research Avenues and Emerging Trends in AI and ML

Artificial Intelligence and Machine Learning have become integral parts of our lives, driving innovation and transforming industries. They are making a significant impact in diverse industries such as healthcare, finance, transportation & logistics, natural language processing, retail and E-commerce, manufacturing, agriculture, education, cybersecurity, and environmental monitoring. The application of AI

and ML is vast and it continues to grow, making it one of the booming sectors for the IT professionals who can understand, implement and leverage these technologies effectively.

This ever-evolving landscape of AI and ML is being influenced by various emerging developments, which professionals in these domains must always stay informed about. Let's take a look at the some of the emerging trends where there is scope for future research and innovation

### EMERGING TRENDS FOR FUTURE RESEARCH & INNOVATION IN AI & ML

- 1 Deep Learning
- 2 Edge Computing
- 3 AI for NLP
- 4 Responsible AI & Ethical Consideration
- 5 Unsupervised Learning & Self-Supervised Learning
- 6 Explainable AI (XAI)
- 7 Federated Learning & Privacy Preserving AI
- 8 Reinforcement Learning
- 9 Auto ML

## Ph.D. in AI and ML: Eligibility and Prerequisites

A Ph.D. in AI and ML is an excellent choice for individuals who want to develop the next generation of these innovative technologies. However, this advanced degree demands a discerning eye for excellence and firm grasp of prerequisites. While specific requirements may vary across institutions, here are some common prerequisites:

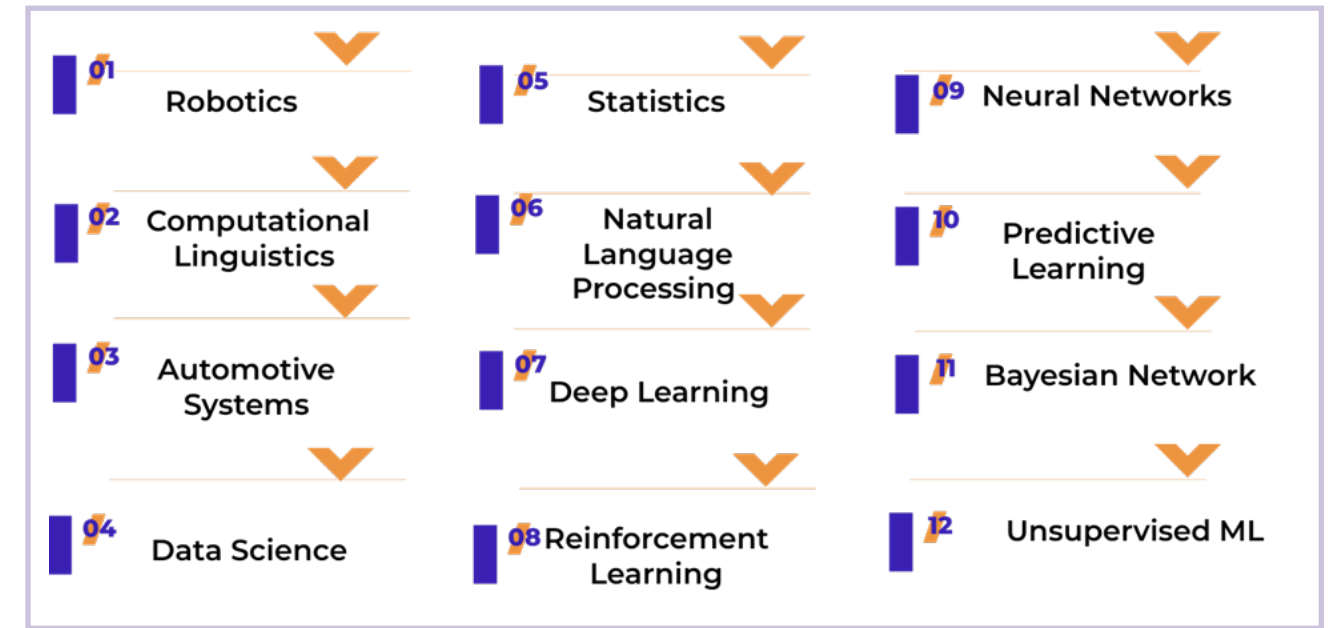
<b>Educational Background</b>	Top colleges for AI & ML in India offer Ph.D. programs to candidates who have a postgraduate degree in AI and ML with a minimum of 55% marks from a recognized university and must have passed the national level entrance examination or university level entrance examination. National level entrance exams like UGC NET / UGC CSIR NET / GATE / SLET or university entrance exam consisting of written tests and personal interviews. Ph.D. programs in AI admit meritorious students and thus requires a minimum undergraduate GPA of 3.0 or higher.
<b>Programming Skills</b>	Proficiency in programming languages and strong coding skills are required for conducting research and implementing algorithms during advanced research studies.
<b>Research Experience</b>	Prior research experience, such as working on projects or publishing papers in conferences or journals, can strengthen your Ph.D. application. It showcases your ability to engage in independent research and contribute to the field.

<b>Letters of Recommendation</b>	Ph.D. applications typically require letters of recommendation from professors or professionals who can vouch for your academic abilities, research potential, and commitment to the field.
<b>Statement of Purpose</b>	A well-crafted statement of purpose is essential to convey your research interests, career goals, and why you are interested in pursuing a Ph.D. in AI and ML. It should highlight your motivations, experiences, and how the specific program aligns with your aspirations.
<b>Standardized Tests:</b>	Some institutions may require standardized test scores, such as the Graduate Record Examination (GRE) or subject-specific tests like the GRE Subject Test in Computer Science
<b>IELTS/TOEFL Scores</b>	If you are an international applicant and English is not your first language, you may need to submit IELTS or TOEFL scores as part of your application to prove your English language competency.

## Navigating AI and ML Landscape: Choose Your Ph.D. Specializations

There are many different sub-domains and fields of research that fall under the umbrella of artificial intelligence and machine learning. Consider your research interests, professional objectives, and the most recent developments in the subject while choosing your Ph.D. specializations. Here are a few of the most popular specializations within the Ph.D. program in AI and ML that leading colleges in India are now offering.

To choose from the above specializations, consider your strengths, evaluate the research



prospects available within the academic institution, and the prevailing market demand to make an informed decision.

## Funding Options for Ph.D. Program in AI and ML in Top Colleges in India

The panorama of funding opportunities available for aspiring scholars in this domain is multifaceted depending on the institution and can be described as follows:

- Scholarships and Fellowships:** Many top colleges for AI & ML in India offer scholarships and fellowships specifically for Ph.D. students. These may cover tuition fees, provide a monthly stipend, or offer research grants to support your studies.
- Research Assistantships:** Research assistantships involve working as a research assistant under a faculty member. These positions often provide a stipend and may involve assisting with research projects or teaching responsibilities.
- Industry Sponsorship:** Some Ph.D. scholars receive sponsorship from companies or organizations working in AI and ML. These sponsorships may involve research collaborations,

internships, or employment opportunities upon completion of the Ph.D. studies.

### 4. Government Funding:

In some countries, government agencies offer grants and scholarships for Ph.D. scholars. These funding options may be subject-specific or available to scholars pursuing research in emerging domains of AI and ML. Additionally, external funding organizations, research grants, and fellowships can provide additional financial support.

## Career Prospects after Completing a Ph.D. in AI and ML

After completing a Ph.D. in AI and ML, scholars have a plethora of exciting and diverse career paths to explore right from academic, manufacturing to top leading roles in AI companies. In the academic realm, they pursue tenure track positions as professors at universities. In this role, they not only conduct cutting-edge research but also take on teaching responsibilities, imparting their expertise to the next generation of AI practitioners.

Alternatively, numerous AI Ph.D. holders also enter the private sector,

particularly at AI-intensive companies. Here, they engage in impactful research and software development, contributing to advancements in various fields. The evolving landscape of vehicle manufacturing also beckons AI Ph.D. graduates. The integration of AI in self-driving cars, enabling ethical decision-making, and optimizing electric vehicle performance exemplifies the significance of their role in shaping the future of transportation. Furthermore, some AI Ph.D. scholars ascend to leadership roles, such as Chief Technology Officers (CTOs), in AI-focused multinational companies.

Thus a Ph.D. graduate is contributing in various sectors and playing a pivotal role in shaping a world of AI and ML.


**Ph.D. Program highlights:**

Course Level	Advanced level of study after Postgraduation
Course Duration	Typically ranges from 3 to 5 years
Eligibility	Top colleges for AI and ML in India offer Ph.D. programs to the candidates who have post graduate degree in AI and ML with a minimum of 55% marks from a recognized university
Admission Process	The admission process for a Ph.D. program in AI and ML is highly competitive. Applicants must submit academic transcripts, letters of recommendation, a statement of purpose, and possibly standardized test scores like GRE or TOEFL (for international students). Shortlisted candidates may undergo interviews or presentations to evaluate their research interests and suitability for the program.

**After completing a Ph.D. in AI and ML, scholars have a plethora of exciting and diverse career paths to explore right from academic, manufacturing to top leading roles in AI companies. In the academic realm, they pursue tenure track positions as professors at universities. In this role, they not only conduct cutting-edge research but also take on teaching responsibilities, imparting their expertise to the next generation of AI practitioners.**

Average Course Fee	The average cost of a Ph.D. in Artificial Intelligence & ML is between INR 50,000 and INR 500,000 each year.
Average Annual Salary	A PhD student in AI and ML may start out with an annual salary of between INR 8 and 12 lakhs per annum.
Top Job Positions	Research Scientist, Machine Learning Engineer, Data Scientist, AI Research Engineer, Academic Professor or Researcher etc.

**Conclusion**

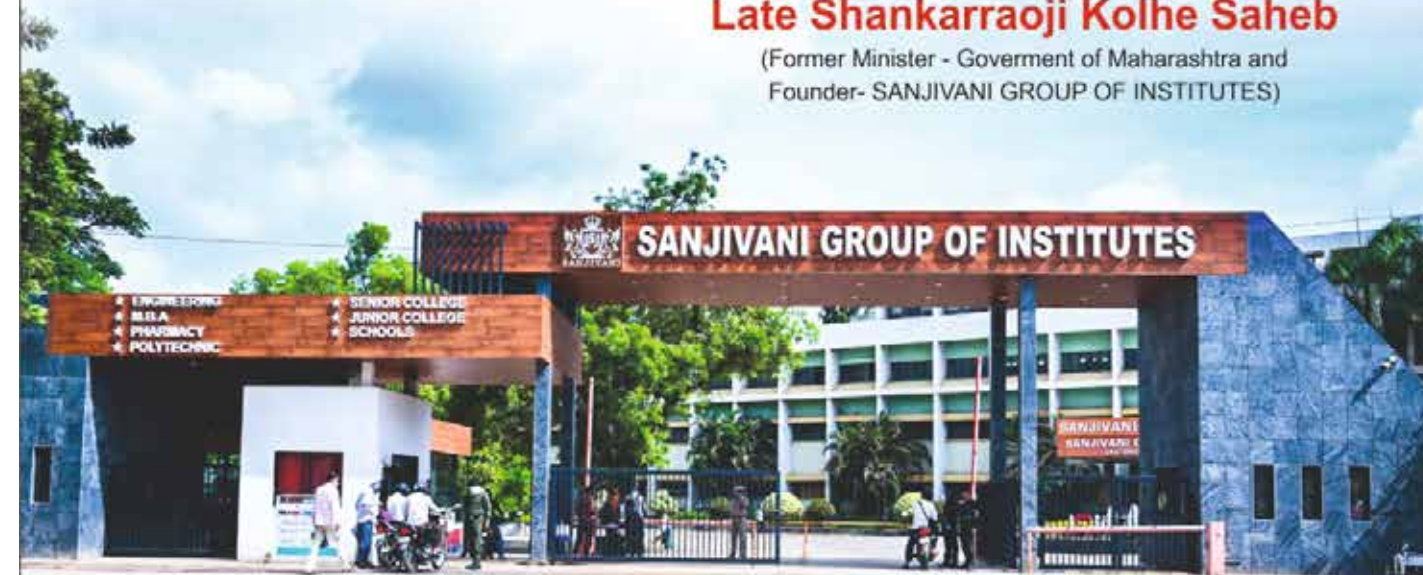
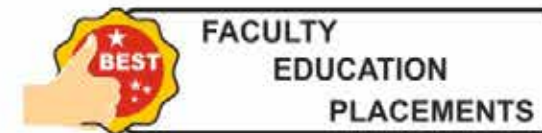
Ph.D. studies, being an advanced research-oriented program, require deep passion for research, a drive for innovation, and a desire to contribute to the advancement of these fields. And the decision to pursue a Ph.D. in AI and ML should align with your long-term goals to achieve something big and become a leading expert in these transformative fields. With the increasing demand for AI and ML professionals, a Ph.D. can provide a competitive edge and open up doors that can lead to intellectual growth, impactful contributions, and a fulfilling career. 



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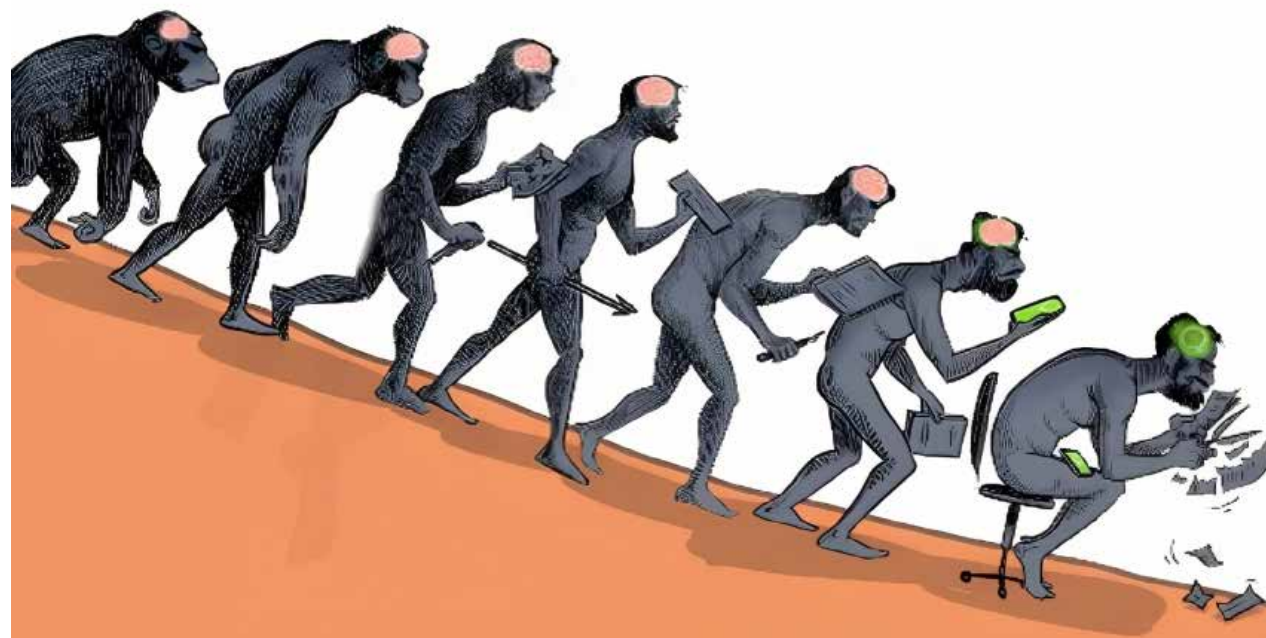
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# NCERT REMOVES DARWIN'S EVOLUTION THEORY...



## DARWIN'S THEORY AND SOCIETY'S THOUGHT

Prabhav Anand

The National Council of Educational Research and Training (NCERT) recently made some changes in middle and high school textbooks that has left academics across the country upset – it omitted a few chapters that educators say were extremely important for the development of scientific views among students.

Among the most noticeable omissions are the chapters that are, “Evolution and Periodic Table” from the science textbooks of classes 9th and 10th. The NCERT justifies these changes as a part of the curriculum “rationalization,” an exercise necessitated by the Covid pandemic.

Opposing Darwin’s theory of evolution has been deeply rooted in religious beliefs since his publication of “On the Origin of Species” in 1859. Numerous religious societies and groups have well-guarded and preserved the creationists’ narratives of human origins.

Even today, countries like Saudi Arabia, Morocco, Algeria, and Oman don’t teach evolution in their schools or universities. And in Egypt and Tunisia, evolution is taught and presented as an “unproven hypothesis.”

After Karl Marx gifted Darwin his book Capital Vol 1, the scientist wrote back, “Though our studies have been different, I believe that we both earnestly desire the extension of knowledge and that this, in the long run, is sure to add to the happiness of mankind.”

While the NCERT claims that the removal of these chapters is a part of the post-covid rationalization, this approach appears irrational for two reasons. Firstly, it will limit the teaching and learning opportunities of this part to the students who choose the science stream in class 11th.

Dropout rates in secondary schools in India, influenced by gender, caste, and economic factors are alarming. NSSO (National Sample Survey Office) data shows that 74 percent of individuals aged 18 and above dropped out before reaching class 12th. As a result, many young students may miss the opportunity to study evolution due to the NCERT’s rationalization exercise.

And secondly, teaching evolution to primary and secondary school children goes beyond imparting scientific knowledge. It is an essential component of holistic scientific development that should be nurtured in schools. Introducing children to the basics of evolution broadens their horizons and enables them to understand life processes beyond societal and religious clichés. It promotes idea generation, enhances rational thinking, and empowers children to question the status quo.

Darwin’s theory has been challenged by many societies and people till today. As we talk about the past, back in 2018, Satyapal Singh, the then Union Minister of Human Resource and Development,

called Darwin’s theory of evolution “scientifically wrong” and also asked to remove it from the syllabus in schools and colleges. Then the next year, the Vice-Chancellor of Andhra University, Nageshwar Rao Gollapalli, claimed that the “theory of Dashavtara” explains evolution better than Darwin’s theory at the 106th Indian Science Congress.

In today’s world of consumerism, a nation is judged by their action and policies. Despite India’s aspirations to present itself as a progressive nation, the removal action from the school textbook presents a negative image in the eye of the world. The deletion of Darwin’s chapter from NCERT textbooks represents a regressive step in the education system.


### Why Darwin’s theory is important

Scientists and educators across the country are not happy with the NCERT move, as they believe Darwin’s theory of evolution one of the most firmly established theories in science. Darwin’s theory not only defines the origination of homo-sapiens (and all other creatures in the world) but also breaks the chain of belief that an “intelligent designer (God)” created them and put them in their place. They pointed to the rationalization as “dangerous” for those students who are deprived of this information, especially those who do not take up biology as a subject after class 10th.

Darwin’s theory of evolution is based on the primary research he did during his lifetime which is the fossils he collected and the wildlife he observed on his five-year trip (1832-36) on the HMS Beagle- a fact that is routinely taught.

The other important aspect that biology classrooms ignore is the impact that the social beliefs of his times had on how Darwin looked at the natural world.

### Conclusion

By incorporating the teaching of Darwin’s theory into our educational curriculum, we open up avenues for such introspection without undermining its substantial contributions. Consequently, while Darwin’s theory should continue to find a place in our textbooks, it is crucial that we rethink how we approach its instruction. It is through this evolution of teaching methods that we can fully harness the potential of Darwin’s theory and equip future generations with the necessary tools to navigate the complexities of science and its ever-evolving nature. 





# SORRY STATE OF INDIA'S HEALTH-CARE SYSTEM

In a country as populous as India, ensuring adequate healthcare services for its citizens is a monumental challenge. The doctor-patient ratio, a key indicator of healthcare accessibility, has been a matter of concern in India for years. Education Post's **Prabhav Anand** explores the current situation of healthcare sector in India, delving into the doctor-patient ratio, healthcare infrastructure, and the impact of COVID-19 on the healthcare sector.

I

was recently on a visit to one of the most prominent hospitals in the capital when I saw that Vijay Ram, a 25-year-old boy, musters a weak cough as he was struggling to get up from the hospital's gate. When I asked them about their situation, they told me something that made me write this article. "We are here for the last three days," says Manjay Ram, the grandfather of Vijay as the two waited in a line of over 200 patients outside the hospital's main gate, seeking an appointment.

"No doctor has been able to find out the exact problem of this disease so far. We've been to many hospitals around our district but nothing happened," says Manjay in a deep-throated voice. But finally, one private hospital doctor in the district suggested taking him to this hospital and consulting the doctor here where he can get the right treatment.

Manjay, who comes from a small village in Bihar's Munger district,

more than 1,300 kilometers from New Delhi, doesn't have any appointments and doesn't even know any doctor's name.

His only option is to wait patiently, hoping to secure one of the limited slots available each morning.

This story of people like Manjay plight and countless others who rise at the first light to join the queue is a stark reminder of the big scarcity of specialized doctors and healthcare professionals in rural India, where more than two-thirds of its 1.4 billion population resides.

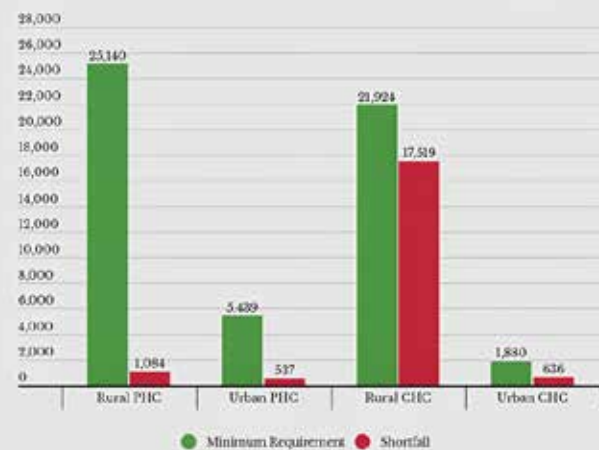
Now imagine a country where millions of people are in dire need of medical attention, but there aren't enough doctors to meet their needs. Picture hospitals overflowing with patients, long queues extending down hallways, and precious minutes slipping away as individuals wait desperately for medical care.

India is grappling with the daunting task of providing adequate healthcare services to its vast population. Among the many challenges faced by the Indian healthcare system, the issue of the doctor-patient ratio looms large. With an ever-increasing population and a shortage of healthcare professionals, ensuring accessible and quality healthcare for all remains a significant concern.

The doctor-patient ratio, a critical metric for evaluating the availability and accessibility of healthcare professionals, serves as a crucial indicator of the healthcare system's capacity to meet the needs of patients. In India, the current doctor-patient ratio stands at approximately 1:834, a figure that is considerably good in comparison to the World Health Organization's (WHO) recommended ratio of 1:1,000. But the question still arises, is this data true? Although this data by NMC (National Medical Commission) has not been officially released anywhere, instead the statement was given by Minister of State for Health and Family Welfare Bharati Pravin Pawar, replying to a question asked by Rajya Sabha member Kanimozhi N.V.N Somu on July 26, 2022.

Inaugurating the first specialized medical institute in northeast India in April, Prime Minister Narendra Modi said that his government had sought to increase the number of doctors by setting up more medical colleges. "This deficiency was a major barrier to quality health services in India," he said. "Therefore, our government has worked on a large scale to increase medical infrastructure and medical professionals in the last nine years."

### Govt Health Centres Experience Doctor Shortfall

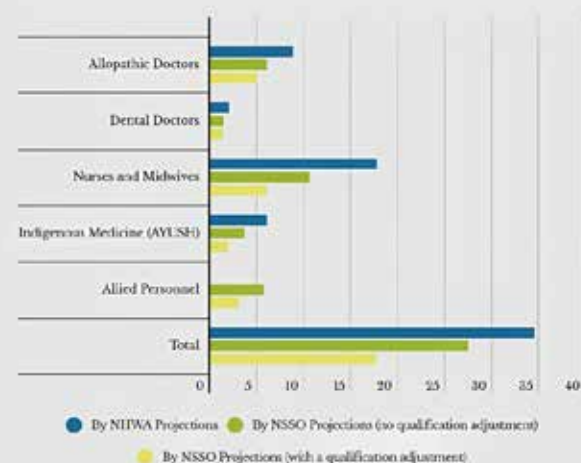


Source: Rural Health Statistics 2021

According to the World Health Organisation (WHO), India's doctor-patient ratio hit a record high of 1.2 doctors per 1,000 patients in 1991, but as its population surged, the ratio dropped to about 0.7 in 2020.

PM Modi's government has built more than a dozen similar medical institutes for specialized treatment since he took office in 2014. The government has plans to build at least one major hospital in each of India's 761 districts. But the problem is the lack of doctors, a shortage that is reaching crucial levels as India

### Number of Health Professionals Per 10,000 Persons



Source: Estimation of National Sample Survey Organisation (NSSO) and National Health Workforce Account (NHWA) 2018 data by Indian Institute of Public Health

becomes the world's most populous nation. The number of public hospitals, excluding specialized institutes, has risen some 9% in Modi's time at the top, government data shows.

Recently the Modi government has highlighted the opening of 23 AIIMS hospitals and the coverage of 50 crore persons under the Ayushman Bharat scheme. The budget outlays for the establishment of the new AIIMSs has not only seen tardy implementation but massive budget overruns from the original estimate of Rs. 650 crore to close to Rs. 7,000 crore. Most of these institutes are yet to get fully functional.

This money could be well spent on strengthening thousands of CHCs and PHCs that are in their most pitiable state. The poor people should be given the basic health facility first instead of giving them the option to choose AIIMS for their treatment.

The consequences of a high doctor-patient ratio are multifaceted. Overcrowded hospitals and clinics are a common sight nowadays, resulting in longer waiting times and stretched resources. Patients often have limited access to primary care physicians, leading them to seek specialized care in tertiary hospitals, further burdening an already strained system. The lack of adequate medical attention can compromise the quality of care provided, impeding timely diagnosis, treatment, and follow-up care.

In India, the healthcare sector is mostly dominated by private healthcare providers. During the early '50s, when the share of the private sector was around 8 percent, but now it has grown up to 70 percent. Almost two-third doctors in the country are working in the private sector.

The National Sample Survey Household social consumption statistics 2017-18 revealed that for private healthcare settings, the cost of hospitalization is seven times more than that of government hospitals.

Even then people prefer private hospitals even after their high expenses. Only 30 percent of the overall population prefers going to government hospitals to seek treatment for their illness. Whereas 43 percent of the people prefer going to private doctors or private clinics for their treatment, 23 percent people

prefer private hospitals and almost 4 percent people prefer to go to charity-based hospitals.

According to research by Factchecker, in, every four out of 10 people choose a government hospital for their in-patient hospitalization.



"India's doctor-patient ratio has long been a pressing concern, and addressing it requires a multi-faceted approach. The challenges contributing to the poor ratio are rooted in various factors like Burgeoning Population, Urban-Rural Disparity, Brain drain of doctors, and Limited Medical Education Infrastructure," says Abhinav Nikunj, a resident doctor at NMCH Sasaram

Abhinav added, "To rectify the doctor-patient ratio in India and improve healthcare accessibility, several measures should be considered like scaling up medical education, incentivizing rural services, augmenting healthcare infrastructure, embracing telemedicine and technology, and public-private collaborations."

According to the World Health Organisation (WHO), India's doctor-patient ratio hit a record high of 1.2 doctors per 1,000 patients in 1991, but as its population surged, the ratio dropped to about 0.7 in 2020.

Despite higher prices in the private sector, people still prefer to go there only because of the absence of doctors and healthcare workers along with quality constraints of the public sector.

### Impact of COVID-19

The COVID-19 pandemic had a profound impact on the healthcare sector in India. The surge in cases exposed the underlying weaknesses in the healthcare system, including the shortage of healthcare professionals, inadequate infrastructure, and insufficient funding. Overburdened hospitals, scarcity of critical medical supplies, and overwhelmed healthcare workers were among the challenges faced during the peak of the pandemic.

However, the crisis also led to some positive changes. The Indian government took various measures to strengthen the healthcare system, including increased funding, expansion of healthcare facilities, and efforts to augment the healthcare workforce. Telemedicine emerged as a crucial tool for remote consultation, reducing the burden on physical hospitals and improving accessibility to healthcare services. [\[P\]](#)

# Is Your Map Meeting Your Learner's Map?



**Dr. Srabani Basu**  
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# H

ave you ever consciously or curiously wondered what constitutes your map of the world? In simple terms a map is not just what you come across in the geography book, it also means an individual's perception of reality and cognitive representation forged and formed by her's environment, culture, beliefs and cognitive processes.

While referring to reality, it is wise to consider that it is not the same for everyone. The concept of reality is very subjective. We know that the human visibility spectrum varies, approximately from 430 terahertz (THz) to 750 THz, and the auditory range spans from 20 Hz to 20,000 Hz. This validates that anything beyond these ranges is imperceptible to the primary human sensory channels: visual, and auditory.

Aristotle in his celebrated work De Anima mentions the 5 primary sensory modalities: visual, auditory, kinesthetic,

olfactory and gustatory. The neuroscientists added 16 more to push the number to 21, however, due to the overlapping of some these were zeroed down to four major areas: Thermoception (heat), Nociception (pain), Equilibrioception (balance) and Proprioception (body awareness).

Eco-psychologist Michael J Cohen adds 32 more to push the list of senses to 53. He categorises these 32 senses under four heads: Radiation senses, Chemical senses, Feeling senses (not to be confused with the Aristotelian kinesthetic), and Mental senses. Cohen argues that our identity as beings is deeply intertwined with our sensory nature. He emphasizes that our human senses constitute a significant aspect of our essence. These senses have been bestowed upon us not for mere indulgence, amusement, or ornamentation. Rather, they are inherent mechanisms meticulously crafted to facilitate our survival and prosperity within the realm of the natural world.

Neuro Linguistic Programming, a domain which emerged in the 1970's as a collaborative pursuit of Richard Bandler and John Grinder, claims that people use their five senses (VAKOG) to create mental representations of their experiences. These mental representations are known as internal representations or "internal representations systems" (IRS). The concept of the internal representational hierarchy suggests that people tend to favour one or more of these sensory modalities when processing and storing information, and this preference influences how they perceive and respond to the world around them, and how they remember, interpret, and communicate about their experiences.

If we accept that we process the information picked up by our sensory modalities differently then our preferred learning styles are likely to differ from one another. In this context, it is obvious that a classroom consists of learners with varying learning styles: visual, auditory and kinesthetic, the last being a combo pack of movement, feeling, touch, smell and taste. Every individual has two maps, viz, the inner or mental map and the linguistic map. Alfred Korzybski, a Polish American philosopher and scientist, introduced the phrase "The map is not the territory" as a fundamental concept in his theory of General Semantics. He aimed to highlight the distinction between human perceptions, abstractions, and models (the "maps") and the objective reality or experience itself (the "territory"). This concept emphasizes that our mental representations of the world are not identical to the actual external reality they represent.

The term "linguistic map", on the other hand,


refers to the mental representation that an individual constructs, often unconsciously, to organize and comprehend language. In essence, a linguistic map serves as a guide for a person's understanding and production of language. The linguistic map may be referred to 'mental grammar' which encompasses the implicit knowledge that speakers of a specific language have about the rules and structures that govern their language structure. This map is the dynamic interplay between language, cognition, culture, beliefs, and values shaping how individuals process and make sense of linguistic information.

In the classroom space, one size does not fit all. Every learner is a unique individual, shaped by their experiences, preferences, and cognitive processes. To truly connect and engage with learners, educators must go beyond delivering information and ensure that they are meeting their learners at their "map." This metaphorical concept emphasizes the importance of tailoring teaching methods, content, and strategies to match each learner's individual learning style, preferences, and needs. However, even before observing and calibrating the learners and identifying their styles, we educators need to be aware of our preferred styles so that unconsciously we do not end up imposing our styles on the learners and when they fail to connect, brand them as stupid, unmindful, inattentive etc.

One of the key aspects of meeting learners at their map involves not only recognizing and accommodating various learning styles but also allowing oneself to be aware of the diversity and uniqueness of pattern that one has. We educators can ignite our creativity in terms of designing and delivering the courses, foster inclusivity, exemplify compassion and most importantly create a space where every learner can blossom according to her's potentials.

Education is a dynamic and multifaceted journey, and successful educators understand that effective teaching goes beyond simply delivering information. To truly empower and inspire learners, educators must meet them at their map. As we navigate the complex landscape of education, let us remember that meeting learners at their map is a compass that guides us toward a brighter future for all. And to quote John Lennon:

*"You may say I'm a dreamer  
But I'm not the only one  
I hope someday you'll join us  
And the world will be as one"*

amidst its multifarious patterns. 



# EDUCATIONAL LOANS/ INSTRUMENTAL IN ENABLING BROADEN THEIR HORIZONS, GAIN INTERNATIONAL EXPERIENCE & FULFIL THEIR ASPIRATIONS

**Vineeta Rajadhyaksha, Product Head - Personal Loan, Education Loan & Student Ecosystem, ICICI Bank** shares her insights with **Education Post** on the role of education loans in helping students accomplish their dreams

## As a bank providing education loans, have you seen a shift in the number of students opting to study abroad?

There has been a spurt in number of students opting to study abroad. Rising income levels, ease in availing an education loan and change in post-study work policy extended by several countries are the reasons responsible for the rise in the number of students going abroad. To name a few, exposure to a new environment, access to high quality education, language immersion and personal growth are some of the benefits of overseas education. Moreover, studying abroad allows a student to broaden their horizons, gain international perspectives and develop valuable skills, making it an attractive choice for many

## How has the trend of students going abroad for studies changed in the past five years?

Overseas education was majorly impacted by the uncertainty wreaked by Covid-19 in 2020 and 2021 across the globe. However, as the pandemic ebbed, the upward trend in higher education abroad has staged a comeback. Since then there has been an exponential rise in the number of students opting for studies abroad. To cater to the needs of students planning to study abroad, most education loan providers including ICICI Bank provide loans that are not restricted to just tuition fees. Now, the students are no longer limited by the financial burden of studying abroad. As a result, countries that offer quality education and favourable visa policies have seen a notable rise in enrolment of Indian students.

## Have education loans bolstered the pursuit of studying abroad by increasing affordability?

Education loans have played a significant role in increasing the affordability of studying abroad for many students. By providing financial support, these loans have enabled students to pursue their aspirations of studying abroad. Education loans have removed the financial barriers that often deterred many from pursuing education abroad.

## How does ICICI Bank stand out amongst its peers in the industry?

For students opting for overseas education, ICICI Bank offers an education loan of Rs 2 crore with collateral and Rs 1 crore without any collateral, covering




not just tuition fees but also one-way travel to the country of study, hostel/accommodation charges, books and other study related materials in the loan amount. The Bank has been at the forefront of introducing innovative financial products and services. One such example is our Campus Power portal, which serves as a one-stop solution for all students. ICICI Bank has a global presence with branches and subsidiaries in various countries, enabling us to serve the Indian diaspora and international customers effectively. Moreover, for students planning to study abroad, we have country specific products like Student Guaranteed Investment Certificate (GIC) programme in Canada, Personal Bank Account in UK, Blocked Account in Germany and much more. ICICI Bank also has tie-ups with entities falling under travel abroad and overseas accommodation domain. These partnerships allow students to make a smooth transition abroad. Moreover, ICICI Bank emphasises on a customer-centric approach with a focus on delivering excellent service and building long-term relationships.

**For students opting for overseas education, ICICI Bank offers an education loan of Rs 2 crore with collateral and Rs 1 crore without any collateral, covering not just tuition fees but also one-way travel to the country of study, hostel/accommodation charges, books and other study related materials in the loan amount. The Bank has been at the forefront of introducing innovative financial products and services.**



#### How do you see the future of education loan sector unfolding?

As the country's economy gets stronger, the demand for education loan will continue to rise. There will be a consistent demand in this sector given the fact that more and more students aspire to go abroad for higher education. 



# IIRF-2023

INDIAN INSTITUTIONAL RANKING FRAMEWORK

Released by :

**EducationPost**  
A NEW HIGH IN EDUCATION

## DISCIPLINE SURVEY MEDICINE

### COURSE ASSESSED MBBS

#### PARAMETERS

- TEACHING LEARNING RESOURCES & PEDAGOGY (TLRP)
- RESEARCH (RS)
- FUTURE ORIENTATION (FO)
- EXTERNAL PERCEPTION & INTERNATIONAL OUTLOOK (EPIO)
- ROI

**FOR METHODOLOGY**

VISIT

**www.iirfranking.com**

Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
1	All India Institute of Medical Sciences	New Delhi	Delhi	1	North	1
2	Christian Medical College	Vellore	Tamil Nadu	1	South	1
3	Post Graduate Institute of Medical Education And Research	Chandigarh	Chandigarh	1	North	2
4	National Institute of Mental Health & Neuro Sciences	Bangalore	Karnataka	1	South	2
5	SDM College of Medical Sciences & Hospital, SDM University	Dharwad	Karnataka	2	South	3
6	Madras Medical College and Government General Hospital	Chennai	Tamil Nadu	2	South	4
7	Institute of Medical Sciences, BHU	Varanasi	Uttar Pradesh	1	North	3
8	Sanjay Gandhi Postgraduate Institute of Medical Sciences	Lucknow	Uttar Pradesh	2	North	4
9	Faculty of Medical Sciences, University of Delhi	Delhi	Delhi	2	North	5
10	Jawaharlal Institute of Post Graduate Medical Education & Research	Puducherry	Pondicherry	1	South	5
11	Amrita Institute of Medical Sciences & Research	Kochi	Kerala	1	South	6
12	Medical College and Hospital Kolkata	Kolkata	West Bengal	1	East	1
13	King George's Medical University	Lucknow	Uttar Pradesh	3	North	6
14	Sree Chitra Tirunal Institute for Medical Sciences and Technology	Thiruvananthapuram	Kerala	2	South	7
15	Sri Ramachandra Institute of Higher Education and Research	Chennai	Tamil Nadu	3	South	8
16	Christian Medical College	Ludhiana	Punjab	1	North	7
17	University College of Medical Sciences (UCMS)	Delhi	Delhi	3	North	8
18	Govt. Medical College & Hospital	Chandigarh	Chandigarh	2	North	9
19	Maulana Azad Medical College	Delhi	Delhi	4	North	10
19	Dr. D. Y. Patil Vidyapeeth	Pune	Maharashtra	1	West	1

Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
20	Vardhman Mahavir Medical College & Safdarjung Hospital	New Delhi	Delhi	5	North	11
21	Kasturba Medical College	Manipal	Karnataka	3	South	9
22	All India Institute of Medical Sciences	Jodhpur	Rajasthan	1	North	12
23	Siksha 'O' Anusandhan	Bhubaneswar	Odisha	1	East	2
24	Saveetha Institute of Medical and Technical Sciences	Chennai	Tamil Nadu	4	South	10
25	Jamia Hamdard	New Delhi	Delhi	6	North	13
26	All India Institute of Medical Sciences	Bhubaneswar	Odisha	2	East	3
26	Jawaharlal Nehru Medical College	Belagavi	Karnataka	4	South	11
27	JSS Medical College	Mysore	Karnataka	5	South	12
28	Ramaiah Medical College	Bengaluru	Karnataka	6	South	13
28	Sri Lakshmi Narayana Institute of Medical Science Medical College & Hospital	Chennai	Tamil Nadu	5	South	13
29	Institute of Liver And Biliary Sciences	New Delhi	Delhi	7	North	14
30	All India Institute of Medical Sciences	Rishikesh	Uttarakhand	1	North	15
31	Institute of Post Graduate Medical Education and Research	Kolkata	West Bengal	2	East	4
32	Dr. Chandramma Dayananda Sagar Institute of Medical Education and Research	Bengaluru	Karnataka	7	South	14
33	All India Institute of Medical Sciences	Patna	Bihar	1	East	5
34	Stanley Medical College	Chennai	Tamil Nadu	6	South	15
35	Maharishi Markandeshwar	Ambala	Haryana	1	North	16
36	All India Institute of Medical Sciences	Bhopal	Madhya Pradesh	1	Central	1
37	Aligarh Muslim University	Aligarh	Uttar Pradesh	4	North	17
38	Lady Hardinge Medical College	New Delhi	Delhi	8	North	18
39	All India Institute of Medical Sciences	Raipur	Chhattisgarh	1	Central	2

Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
40	Adichunchanagiri Institute of Medical Sciences	B.G Nagara	Karnataka	8	South	16
41	Meenakshi Medical College Hospital & Research Institute	Chennai	Tamil Nadu	7	South	17
41	PSG Institute of Medical Sciences & Research	Coimbatore	Tamil Nadu	7	South	17
42	Gujarat Cancer & Research Institute	Ahmedabad	Gujarat	1	West	2
42	Topiwala National Medical College	Mumbai	Maharashtra	2	West	2
43	Datta Meghe Institute of Medical Sciences	Wardha	Maharashtra	3	West	3
44	Dayanand Medical College	Ludhiana	Punjab	2	North	19
44	Government Medical College	Thiruvananthapuram	Kerala	3	South	18
45	Sawai Man Singh Medical College	Jaipur	Rajasthan	2	North	20
45	S. R. M. Institute of Science and Technology	Chennai	Tamil Nadu	8	South	19
46	St. John's Medical College	Bengaluru	Karnataka	9	South	20
47	Krishna Institute of Medical Sciences	Karad	Maharashtra	4	West	4
47	Chettinad Academy of Research and Education	Kelambakkam	Tamil Nadu	9	South	21
48	Gauhati Medical College And Hospital	Guwahati	Assam	1	North East	1
49	Kasturba Medical College	Magalore	Karnataka	10	South	22
50	Bharati Vidyapeeth Medical College	Pune	Maharashtra	5	West	5
51	Sri Muthukumaran Medical College Hospital & Research Institute	Chennai	Tamil Nadu	10	South	23
52	R A Podar Ayurved Medical College	Mumbai	Maharashtra	6	West	6
53	Mahatma Gandhi Medical College And Research Institute	Puducherry	Pondicherry	2	South	24
54	Armed Forces Medical College	Pune	Maharashtra	7	West	7
55	Grant Medical College	Mumbai	Maharashtra	8	West	8
56	Annamalai University	Annamalai Nagar	Tamil Nadu	11	South	25

Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
57	Bhaarath Medical College & Hospital.	Chennai	Tamil Nadu	12	South	26
58	Kalinga Institute of Industrial Technology	Bhubaneswar	Odisha	3	East	6
59	Regional Institute of Medical Sciences	Imphal West	Manipur	1	North East	2
60	Teerthankar Mahaveer University	Moradabad	Uttar Pradesh	5	North	21
61	Government Medical College	Srikakulam	Andhra Pradesh	1	South	27
62	Parul University	Vadodra	Gujarat	2	West	9
63	Sardar Patel Medical College	Bikaner	Rajasthan	3	North	22
64	Coimbatore Medical College	Coimbatore	Tamil Nadu	13	South	28
65	B.J. Medical College	Ahmedabad	Gujarat	3	West	10
66	Netaji Subash Chandra Bose Medical College	Jabalpur	Madhya Pradesh	2	Central	3
67	Integral Institute of Medical Sciences & Research, Integral University	Lucknow	Uttar Pradesh	6	North	23
68	Jawaharlal Nehru Medical College	Ajmer	Rajasthan	4	North	24
69	SN Medical College	Jodhpur	Rajasthan	5	North	25
70	Jubilee Mission Medical College and Research Institute	Thrissur	Kerala	4	South	29
71	Rabindra Nath Tagore Medical College	Udaipur	Rajasthan	6	North	26
72	K J Somaiya Medical College	Mumbai	Maharashtra	9	West	11
73	Rajasthan Unani Medical College & Hospital	Jaipur	Rajasthan	7	North	27
74	Maharashtra Institute of Medical Education and Research	Talegaon Dabhade	Maharashtra	10	West	12
75	Smt. NHL Municipal Medical College	Ahmedabad	Gujarat	4	West	13
76	Sri Venkateswara Institute of Medical Sciences	Tirupati	Andhra Pradesh	2	South	30
77	Sophia Institute of Medical Sciences	Gwalior	Madhya Pradesh	3	Central	4
78	Calicut Medical College	Kozhikode	Kerala	5	South	31
79	Amala Institute of Medical Sciences	Thrissur	Kerala	6	South	32
80	Baroda Medical College	Vadodara	Gujarat	5	West	14

Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
81	Tirunelveli Medical College	Tirunelveli	Tamil Nadu	14	South	33
82	Patna Medical College	Patna	Bihar	2	East	7
83	Gajra Raja Medical College	Gwalior	Madhya Pradesh	4	Central	5
84	Maharaja Krishna Chandra Gajapati Medical College & Hospital	Berhampur	Odisha	4	East	8
85	Sri Guru Ram Das Institute of Medical Sciences & Research	Amritsar	Punjab	3	North	28
86	Adesh Institute of Medical Sciences and Research	Bathinda	Punjab	4	North	29
87	Sri Aurobindo Institute of Medical Sciences	Indore	Madhya Pradesh	5	Central	6
88	Calcutta National Medical College	Kolkata	West Bengal	3	East	9
89	Surat Government Medical College	Surat	Gujarat	6	West	15
90	Seth Gordhandas Sunderdas Medical College	Mumbai	Maharashtra	11	West	16
91	RG Kar Medical College	Kolkata	West Bengal	4	East	10
92	North Bengal Medical College	Siliguri	West Bengal	5	East	11
93	Pravara Institute of Medical Sciences	Ahmednagar	Maharashtra	12	West	17
94	Darbhanga Medical College	Darbhanga	Bihar	3	East	12
95	K. S. Hegde Medical Academy	Mangaluru	Karnataka	11	South	34
96	Mahatma Gandhi Medical College and Hospital	Jaipur	Rajasthan	8	North	30
97	KMCT Medical College	Kozhikode	Kerala	7	South	35
98	KPC Medical College	Kolkata	West Bengal	6	East	13
99	Swasthya Kalyan Homoeopathic Medical College & Research Centre	Jaipur	Rajasthan	9	North	31
99	The Indira Gandhi Technical & Medical Sciences University	Ziro	Arunachal Pradesh	1	North East	3
100	Peoples College of Medical Sciences & Research Centre	Bhopal	Madhya Pradesh	6	Central	7



# IIRF-2023

INDIAN INSTITUTIONAL RANKING FRAMEWORK

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## DISCIPLINE SURVEY HEALTH SCIENCES

COURSE ASSESSED  
**DENTAL**

### PARAMETERS

- TEACHING LEARNING RESOURCES & PEDAGOGY (TLRP)
- RESEARCH (RS)
- FUTURE ORIENTATION (FO)
- EXTERNAL PERCEPTION & INTERNATIONAL OUTLOOK (EPIO)
- ROI

**FOR METHODOLOGY**

VISIT

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Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
1	Maulana Azad Institute of Dental Sciences	Delhi	Delhi	1	North	1
2	Sri Ramachandra Institute of Higher Education and Research	Chennai	Tamil Nadu	1	South	1
3	Manipal College of Dental Sciences	Udupi	Karnataka	1	South	2
4	SDM College of Dental Sciences & Hospital	Dharwad	Karnataka	2	South	3
5	Faculty of Dental Sciences, King George's Medical University	Lucknow	Uttar Pradesh	1	North	2
6	JSS Dental College and Hospital	Mysuru	Karnataka	3	South	4
7	Christian Dental College	Ludhiana	Punjab	1	North	3
8	Faculty of Dental Sciences, BHU	Varanasi	Uttar Pradesh	2	North	4
9	Postgraduate Institute of Dental Sciences	Rohtak	Haryana	1	North	5
10	Saveetha Institute of Medical and Technical Sciences	Chennai	Tamil Nadu	2	South	5
11	Faculty of Dentistry, Jamia Millia Islamia	New Delhi	Delhi	2	North	6
12	Dr. D. Y. Patil Dental College and Hospital	Pune	Maharashtra	1	West	1
13	Amrita School of Dentistry	Kochi	Kerala	1	South	6
14	Meenakshi Ammal Dental College & Hospital	Chennai	Tamil Nadu	3	South	7
15	Institute of Dental Sciences, Siksha 'O' Anusandhan	Bhubaneswar	Odisha	1	East	1
16	Datta Meghe Institute of Medical Sciences	Wardha	Maharashtra	2	West	2
17	Nair Hospital Dental College	Mumbai	Maharashtra	3	West	3
18	SRM Dental College	Chennai	Tamil Nadu	4	South	8
19	Manipal College of Dental Sciences	Mangalore	Karnataka	4	South	9
20	Dayananda Sagar College of Dental Sciences	Bengaluru	Karnataka	5	South	10

Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
21	A.B.Shetty Memorial Institute of Dental Sciences	Mangaluru	Karnataka	6	South	11
22	Ramaiah University of Applied Sciences	Bengaluru	Karnataka	7	South	12
23	Yenepoya Dental College	Mangaluru	Karnataka	8	South	13
24	Bharati Vidyapeeth Dental College & Hospital	Pune	Maharashtra	4	West	4
25	Bapuji Dental College & Hospital	Davangere	Karnataka	9	South	14
26	Maharishi Markandeshwar University	Ambala	Haryana	2	North	7
27	Manav Rachna Dental College	Faridabad	Haryana	3	North	8
28	College of Dental Sciences	Davangere	Karnataka	10	South	15
29	Government Dental College	Thiruvananthapuram	Kerala	2	South	16
30	M. G. R. Educational And Research Institute	Chennai	Tamil Nadu	5	South	17
31	Govt. Dental College & Hospital	Nagpur	Maharashtra	5	West	5
32	Kalinga Institute of Industrial Technology	Bhubaneswar	Odisha	2	East	2
33	Aligarh Muslim University	Aligarh	Uttar Pradesh	3	North	9
34	Chettinad Dental College & Research Institute	Kancheepuram	Tamil Nadu	6	South	18
35	Government Autonomous College of Dentistry	Indore	Madhya Pradesh	1	Central	1
36	Govt. Dental College & Research Institute	Bengaluru	Karnataka	11	South	19
37	Govt. Dental College & Hospital	Mumbai	Maharashtra	6	West	6
38	VSPM's Dental College & Research Centre	Nagpur	Maharashtra	7	West	7
39	Govt. Dental College & Hospital	Nagpur	Maharashtra	8	West	8
40	M. R. Ambedkar Dental College, and Hospital	Bengaluru	Karnataka	12	South	20
41	Parul University	Vadodara	Gujarat	1	West	9

Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
42	Dr. Harvansh Singh Judge institute of Dental Sciences & Hospital, Panjab University	Chandigarh	Chandigarh	1	North	10
43	School of Dental Sciences, Krishna Institute of Medical Sciences	Karad	Maharashtra	9	West	10
44	Padmashree Dr. D.Y. Patil Dental College & Hospital	Navi Mumbai	Maharashtra	10	West	11
45	Tamil Nadu Government Dental College & Hospital	Chennai	Tamil Nadu	7	South	21
46	Sinhgad Dental College & Hospital	Pune	Maharashtra	11	West	12
47	Karpaga Vinayaga Institute of Dental Sciences	Kanchipuram	Tamil Nadu	8	South	22
48	Sathyabama University Dental College And Hospital	Chennai	Tamil Nadu	9	South	23
49	Army College of Dental Sciences	Secunderabd	Telangana	1	South	24
50	KLE Vishwanath Katti Institute of Dental Sciences	Belgaum	Karnataka	13	South	25
51	Govt. Dental College & Hospital	Aurangabad	Maharashtra	12	West	13
52	A. B. S. M. Institute of Dental Sciences	Mangaluru	Karnataka	14	South	26
53	RVS Dental College & Hospital	Sulur	Tamil Nadu	10	South	27
54	Pacific Dental College	Udaipur	Rajasthan	1	North	11
55	Nanded Rural Dental College & Research Center	Nanded	Maharashtra	13	West	14
56	Priyadarshini Dental College & Hospital	Pandur	Maharashtra	14	South	28
57	Maharashtra Institute of Dental Sciences & Research	Latur	Maharashtra	15	West	15
58	Yerala Medical Trust & Research Centre's Dental College & Hospital	Navi Mumbai	Maharashtra	16	West	16
59	Sri Siddhartha Dental College	Tumkur	Karnataka	15	South	29
60	Sri Venkateswara Dental College & Hospital	Kancheepuram	Tamil Nadu	11	South	30



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INDIAN INSTITUTIONAL RANKING FRAMEWORK

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## DISCIPLINE SURVEY HEALTH SCIENCES

COURSE ASSESSED

**B.Sc. Nursing (4 years)**

### PARAMETERS

- TEACHING LEARNING RESOURCES & PEDAGOGY (TLRP)
- RESEARCH (RS)
- FUTURE ORIENTATION (FO)
- EXTERNAL PERCEPTION & INTERNATIONAL OUTLOOK (EPIO)
- ROI

**FOR METHODOLOGY**

VISIT

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Rank*	Nursing College	City	State	Zone	Zone Rank
1	College of Nursing, Christian Medical College	Vellore	Tamil Nadu	South	1
2	College of Nursing, St. Stephen's Hospital	Central Delhi	Delhi	North	1
3	College of Nursing, Tata Main Hospital	Jamshedpur	Jharkhand	East	1
4	College of Nursing, Christian Medical College & Hospital	Ludhiana	Punjab	North	2
5	St. John's College of Nursing	Vellore	Tamil Nadu	South	2
6	Holy Family Hospital College of Nursing	New Delhi	Delhi	North	3
7	P G College of Nursing	Durg	Chattisgarh	Central	1
8	St. John's College of Nursing	Bangalore	Karnataka	South	3
9	S D M Institute of Nursing Sciences	Dharwad	Karnataka	South	4
10	Datta Meghe College of Nursing	Nagpur	Maharashtra	West	1
11	Bishop's College of Nursing	Erode	Tamil Nadu	South	5
12	Siksha 'O' Anusandhan	Bhubaneswar	Odisha	East	2
13	Gitam Institute of Nursing Gandhi Nagar Campus	Visakhapatnam	Andhra Pradesh	South	6
14	J S S College of Nursing	Mysuru	Karnataka	South	7
15	Utkal University School of Nursing and Allied Health Science	Bhubaneswar	Orissa	East	3
16	College of Nursing Sri Ramakrishna Institute of Paramedical Sciences	Coimbatore	Tamil Nadu	South	8
17	Dayananda Sagar College of Nursing	Bangalore	Karnataka	South	9
18	Nizams Institute of Medical Sciences	Hyderabad	Telangana	South	10
19	St. Marys College of Nursing	Lucknow	Uttar Pradesh	North	4
20	Arulmigu Meenakshi College of Nursing	Kanchipuram	Tamil Nadu	South	11
21	Sri Ramachandra College of Nursing	Chennai	Tamil Nadu	South	12
22	PSG College of Nursing	Coimbatore	Tamil Nadu	South	13
23	Bangalore Baptist Hospital	Bangalore	Karnataka	South	14

Rank*	Nursing College	City	State	Zone	Zone Rank
23	Bharati Vidyapeeth College of Nursing	Pune	Maharashtra	West	2
24	Manipal College of Nursing A Constituent of Manipal Academy of Higher Education (Mahe)	Manipal	Karnataka	South	15
25	Dr. D Y Patil College of Nursing	Navi Mumbai	Maharashtra	West	3
26	Kasturba Gandhi Nursing College	Puducherry	Pondicherry	East	4
27	St. Gregorios College of Nursing Parumala	Parumala	Kerala	South	16
27	Bharath College of Nursing (Faculty of Nursing, BIHER)	Chennai	Tamil Nadu	South	16
28	S N D College of Nursing	Nashik	Maharashtra	West	4
29	Symbiosis College of Nursing, Symbiosis International	Pune	Maharashtra	West	5
30	Kalinga Institute of Nursing Sciences	Bhubaneswar	Orissa	East	5
30	Venkateswara Nursing College	Chennai	Tamil Nadu	South	17
31	Pravara Institute of Medical Sciences College of Nursing	Ahmadnagar	Maharashtra	West	6
32	Ramaiah Institute of Nursing Education & Research	Bangalore	Karnataka	South	18
33	Chitkara School of Health Sciences, Chitkara University	Patiala	Punjab	North	5
33	Faculty of Nursing Banasthali Vidyapith	Banasthali	Rajasthan	North	5
34	St. John College of Nursing	Warangal	Telangana	South	19
35	Faculty of Nursing, Dr M G R Educational & Research Institute	Chennai	Tamil Nadu	South	20
36	Maharishi Markandeshwar Institute of Nursing, Maharishi Markandeshwar University	Ambala	Haryana	North	6
36	Bapuji College of Nursing, S.S. General Hospital	Davangere	Karnataka	South	21
37	Teerthankar Mahaveer University	Moradabad	Uttar Pradesh	North	7
38	Parul Institute of Nursing	Vadodara	Gujarat	West	7

Rank*	Nursing College	City	State	Zone	Zone Rank
39	VSPM Madhuribai Deshmukh Institute of Nursing Education	Nagpur	Maharashtra	West	8
40	Adichhuchanagiri College of Nursing	B G Nagra	Karnataka	South	22
40	Saveetha College of Nursing Saveetha University	Chennai	Tamil Nadu	South	22
41	B M S Hospital Nursing College	Bangalore	Karnataka	South	23
42	R V College of Nursing	Bangalore	Karnataka	South	24
42	Ashoka Institute of Nursing	Patiala	Punjab	North	8
43	Al- Ameen Fathima College of Nursing	Bijapur	Karnataka	South	25
44	B L D E A's Shri B M Patil Institute of Nursing Sciences	Bijapur	Karnataka	South	26
45	Holy Cross College of Nursing	Kollam	Kerala	South	27
46	Army Institute of Nursing	Guwahati	Assam	North-East	1
47	K J Somaiya College of Nursing	Mumbai	Maharashtra	West	9
47	Karpagam College of Nursing	Coimbatore	Tamil Nadu	South	28
48	Shri Sathya Sai College of Nursing	Kancheepuram	Tamil Nadu	South	29
49	Padmashree Dr. D Y Patil College of Nursing	Pune	Maharashtra	West	10
49	National Institute of Nursing	Sangrur	Punjab	North	9
50	Arunachal University of Studies	Namsai	Arunachal Pradesh	North-East	2
51	Christian College of Nursing	Bangalore	Karnataka	South	30
52	K I M S College of Nursing, Krishna Institute of Medical Sciences College of Nursing	Secunderabad	Telangana	South	31
53	Batra Hospital & Medical Research Centre	New Delhi	Delhi	North	10
54	Shimla Nursing College	Shimla	Himachal Pradesh	North	11
55	Royal College of Nursing	Durgapur	West Bengal	East	6
56	Padmashree Dr. D Y Patil College of Nursing	Kolhapur	Maharashtra	West	11

Rank*	Nursing College	City	State	Zone	Zone Rank
57	Nitte Usha Institute of Nursing Sciences	Mangalore	Karnataka	South	32
58	Dr. John's College of Nursing	Bangalore	Karnataka	South	33
59	Padmavathi College of Nursing	Dharmapuri	Tamil Nadu	South	34
60	St. Thomas College of Nursing	Alappuzha	Kerala	South	35
61	St. Luke's College of Nursing	Visakhapatnam	Andhra Pradesh	South	36
62	F R Mullers College of Nursing	Mangalore	Karnataka	South	37
63	Dr. B R Ambedkar Institute of Nursing	Bangalore	Karnataka	South	38
64	College of Nursing Public Khalsa College For Women	Hoshiarpur	Punjab	North	12
65	K L E University's Institute of Nursing Sciences	Belgaum	Karnataka	South	39
66	Aurovindo College of Nursing	Bhopal	Madhya Pradesh	Central	2
67	City College of Nursing, Instt. of Nursing	Mangalore	Karnataka	South	40
67	Vinayaka Mission's College of Nursing	Karaikal	Pondicherry	East	7
68	Guru Teg Bahadur College of Nursing	Amritsar	Punjab	North	13
68	College of Nursing, Pt. Deen Dayal Upadhyaya University of Health Sciences	Karnal	Haryana	North	13
69	Srm College of Nursing	Kancheepuram	Tamil Nadu	South	41
70	St. Joseph's College of Nursing	Hoshangabad	Madhya Pradesh	Central	3
71	Kasturba Nursing College	Wardha	Maharashtra	West	12
72	Karnataka College of Nursing	Bangalore	Karnataka	South	42
73	Bethesda College of Nursing	Manipur	Manipur	North-East	3
73	Christian Nursing College	Kullu	Himachal Pradesh	North	14
74	Seva Mandal Education Society's Smt. Sunanda Pravin Gambhirchand College of Nursing	Mumbai	Maharashtra	West	13

Rank*	Nursing College	City	State	Zone	Zone Rank
74	Oriental Institute of Nursing	Balaghat	Madhya Pradesh	Central	4
75	St. Joseph's College of Nursing	Mysuru	Karnataka	South	43
76	Mother Teresa College of Nursing	Aurangabad	Maharashtra	West	14
77	Sree Balaji College of Nursing	Chennai	Tamil Nadu	South	44
78	Peerless Institute of Nursing Peerless Hospital & B. K. Roy Research Centre	Kolkata	West Bengal	East	8
79	Sister Florence College of Nursing	Kolkata	West Bengal	East	9
80	Annai Veilankanni's College of Nursing	Kancheepuram	Tamil Nadu	South	45
80	Gayathri College of Nursing	Bangalore	Karnataka	South	45
81	Sacred Heart Nursing College	Madurai	Tamil Nadu	South	46
82	Annai Meenakshi College of Nursing	Coimbatore	Tamil Nadu	South	47
83	St. Peter's Nursing School/College And Research Institute	Hosur	Tamil Nadu	South	48
83	Presidency College of Nursing	Bangalore	Karnataka	South	48
84	Apollo College of Nursing	Hyderabad	Telangana	South	49
85	Shree Siddaganga Institute of Nursing Sciences & Research Centre	Tumkur	Karnataka	South	50
86	Baba Farid College of Nursing	Faridkot	Punjab	North	15
87	Desh Bhagat University College of Nursing	Fatehgarh Sahib	Punjab	North	16
88	Christ College of Nursing Christ Hospital	Rajkot	Gujarat	West	15
89	Rufaida College of Nursing, Hamdard Nagar	New Delhi	Delhi	North	17
90	Sankar Madhab College of Nursing	Guwahati	Assam	North-East	4
91	Florence College of Nursing	Bangalore	Karnataka	South	51
92	Shaheed Udham Singh College of Nursing	Fatehabad	Haryana	North	18
93	Faculty of Nursing SGT University Shree Guru Gobind Singh Tricentenary University	Gurugram	Haryana	North	19
94	I I M T College of Medical Sciences	Meerut	Uttar Pradesh	North	20

Rank*	Nursing College	City	State	Zone	Zone Rank
95	Indore Institute of Medical Sciences, College of Nursing	Indore	Madhya Pradesh	Central	5
96	St. George College of Nursing	Bangalore	Karnataka	South	52
97	Shri Guru Ram Dass College of Nursing	Hoshiarpur	Punjab	North	21
98	Miranda College of Nursing	Bangalore	Karnataka	South	53
99	Carmel College of Nursing	Ernakulam	Kerala	South	54
100	Rajiv Gandhi College of Nursing	Bangalore	Karnataka	South	55
101	Institute of Nursing Sciences Studies & Research	Gwalior	Madhya Pradesh	Central	6
102	Holy Spirit Institute of Nursing Education	Mumbai	Maharashtra	West	16
103	School of Health Sciences, RIMT University	Gobindgarh	Punjab	North	22
104	Smt Radhikabai Meghe Memorial College of Nursing Datta Meghe Institute of Medical Sciences Sawangi	Wardha	Maharashtra	West	17
105	Uttaranchal Pg College of Bio Medical Sciences & Hospital	Dehradun	Uttarakhand	North	23
106	Combined ( P G ) Institute of Medical Sciences	Dehradun	Uttarakhand	North	24
107	Sikkim Manipal Institute of Medical Sikkim Manipal College of Nursing, Sikkim Manipal University	Gangtok	Sikkim	North-East	5
108	Apollo College of Nursing	Chennai	Tamil Nadu	South	56
109	Holy Cross College of Nursing	Kamagere	Karnataka	South	57
110	Adarsh College of Nursing	Patiala	Punjab	North	25
111	Heartland College of Nursing	Bangalore	Karnataka	South	58
112	St Joseph's College of Nursing	Ernakulam	Kerala	South	59
113	Lala Lajpat Rai Institute of Nsg Education College of Nursing	Jalandhar	Punjab	North	26
114	Medwin College of Nursing	Hyderabad	Telangana	South	60
115	P E S College of Nursing Pesimsr Campus	Chittoor	Andhra Pradesh	South	61

Rank*	Nursing College	City	State	Zone	Zone Rank
116	Mahatma Jyotiba Fule College of Nursing	Jaipur	Rajasthan	North	27
117	Woodlands College of Nursing	Bhasa	West Bengal	East	10
118	B M Birla College of Nursing	Kolkata	West Bengal	East	11
119	Maitri College of Nursing Maitri Educational Society	Durg	Chattisgarh	Central	7
120	St. Joseph' S College of Nursing	Guntur	Andhra Pradesh	South	62
121	Mother Teresa College of Nursing	Durg	Chattisgarh	Central	8
122	Aragonda Apollo College of Nursing	Chittoor	Andhra Pradesh	South	63
123	Vrundavan Institute of Nursing Education	Bardez	Goa	West	18
124	College of Nursing Kurji Holy Family Hospital	Patna	Bihar	East	12
125	Kailash Institute of Health And Medical Sciences	Panchkula	Haryana	North	28
126	East West College of Nursing	Bangalore	Karnataka	South	64
127	C.H.M. Shah Nursing College	Gandhinagar	Gujarat	West	19
128	Guru Dronacharya College of Nursing	Dharamsala	Himachal Pradesh	North	29
129	Chamunda Institute of Medical Science And Nursing College	Kullu	Himachal Pradesh	North	30
130	Chinmaya Institute of Nursing	Bangalore	Karnataka	South	65
131	Bharathi College of Nursing	Tumkur	Karnataka	South	66
132	Acharya College of Nursing	Bangalore	Karnataka	South	67
133	Oxford College of Nursing Sciences	Bangalore	Karnataka	South	68
134	Shrinidhi College of Nursing	Bangalore	Karnataka	South	69
135	Indira Nursing College	Mangalore	Karnataka	South	70
136	Florence College of Nursing	Ranchi	Jharkhand	East	13
136	Sri Venkateshwara College of Nursing	Bangalore	Karnataka	South	71
137	Federal College of Nursing	Bangalore	Karnataka	South	72

Rank*	Nursing College	City	State	Zone	Zone Rank
138	Ellen Thoburn Cowen Memorial (EtcM) Hospital	Kolar	Karnataka	South	73
139	Cauvery College of Nursing	Mysore	Karnataka	South	74
140	Baby Memorial College of Nursing	Kozhikode	Kerala	South	75
141	Indian Institute of Nursing Science and Research	Jabalpur	Madhya Pradesh	Central	9
142	Sri Aurobindo Institute of Medical Sciences, College of Nursing	Indore	Madhya Pradesh	Central	10
143	Holy Family College of Nursing	Idukki	Kerala	South	76
144	Bishop Benziger College of Nursing	Kollam	Kerala	South	77
145	M G M Muthoot College of Nursing	Pathanamthitta	Kerala	South	78
146	Holy Family Institute of Nursing Education	Mumbai	Maharashtra	West	20
147	Nazarene Nurses Training College	Washim	Maharashtra	West	21
148	K I M S College of Nursing	Thiruvananthapuram	Kerala	South	79
149	Mercy College of Nursing	Kollam	Kerala	South	80
150	Sofia College of Nursing	Bangalore	Karnataka	South	81
151	Bharati Vidyapeeth College of Nursing	Navi Mumbai	Maharashtra	West	22
152	St. John's College of Nursing	Idukki	Kerala	South	82
152	Amity College of Nursing Amity Education Valley	Gurugram	Haryana	North	31
153	Sardar Patel College of Nursing	Ratlam	Madhya Pradesh	Central	11
154	Dr. Shankar Dayal Sharma College of Nursing	Bhopal	Madhya Pradesh	Central	12
155	Bharati Vidyapeeth College of Nursing	Sangli	Maharashtra	West	23
156	Rajarajeswari College of Nursing	Bangalore	Karnataka	South	83
157	Amaltas Institute of Nursing Sciences	Dewas	Madhya Pradesh	Central	13
158	Manjushree College of Nursing	Bangalore	Karnataka	South	84

Rank*	Nursing College	City	State	Zone	Zone Rank
159	Matoshri College of Nursing	Nashik	Maharashtra	West	24
160	Ruckmoni College of Nursing	Trivandrum	Kerala	South	85
161	Archana College of Nursing	Pathanamthitta	Kerala	South	86
162	St. Joseph's College of Nursing	Kollam	Kerala	South	87
163	MGM New Bombay College of Nursing	Navi Mumbai	Maharashtra	West	25
164	Boston Institute of Nursing	Morena	Madhya Pradesh	Central	14
165	Amrita College of Nursing	Ernakulam	Kerala	South	88
166	Lingaya's Institute of Health Sciences( Nursing)	Faridabad	Haryana	North	32
166	St. Joseph College of Nursing	Eluru	Andhra Pradesh	South	89
167	Manonidhi Institute of Nursing	Chamarajanagar	Karnataka	South	90
168	M I T's Nursing College	Aurangabad	Maharashtra	West	26
169	Dr. B R Ambedkar College of Nursing	Gandhinagar	Gujarat	West	27
170	Yamuna Institute of Nursing	Yamuna Nagar	Haryana	North	33
171	Mother Terrasa College of Nursing	Mehsana	Gujarat	West	28
172	Sri Vinayaka College of Nursing	Bangalore	Karnataka	South	91
173	Apollo Institute of Nursing	Gandhinagar	Gujarat	West	29
174	Shankersinh Vaghela Bapu Institute of Nursing	Gandhinagar	Gujarat	West	30
175	Metas Adventist College Seventh Day Adventist Hospital Campus	Ranchi	Jharkhand	East	14
176	Bibi Halima College of Nursing & Med. Technology	Srinagar	Jammu & Kashmir	North	34
177	Manjunatha College of Nursing	Bangalore	Karnataka	South	92
178	Mangalore College of Nursing	Mangalore	Karnataka	South	93
178	K L E Society's Institute of Nursing Sciences	Hubli	Karnataka	South	93
179	St Mary's College of Nursing	Chitradurga	Karnataka	South	94

Rank*	Nursing College	City	State	Zone	Zone Rank
180	Sadhu Vaswani College of Nursing	Pune	Maharashtra	West	31
181	Shri Balaji Institute of Nursing C/O, Shri Balaji Super Specialty Hospital Campus	Raipur	Chattisgarh	Central	15
182	Maharishi Markadeshwar College of Nursing	Solan	Himachal Pradesh	North	35
183	Banaswadi College of Nursing	Bangalore	Karnataka	South	95
184	Rajiv Gandhi College of Nursing	Jammu	Jammu & Kashmir	North	36
185	Crescent College of Nursing	Kadapa	Andhra Pradesh	South	96
186	Geetanjali College of Nursing	Kurnool	Andhra Pradesh	South	97
187	Athena College of Nursing	Mangalore	Karnataka	South	98
188	Care Waltair College of Nursing	Visakhapatnam	Andhra Pradesh	South	99
189	J E S Mother Teresa College of Nursing	Bangalore	Karnataka	South	100
189	Father Mathews College of Nursing	Bangalore	Karnataka	South	100
190	Josco College of Nursing	Bangalore	Karnataka	South	101
191	Smt Bakul Tambat Institute of Nursing Education	Pune	Maharashtra	West	32
192	Mahatma Gandhi Professional College of Nursing	Bangalore	Karnataka	South	102
193	Mohali Nursing College	Fatehgarh Sahib	Punjab	North	37
194	Dr. Helen College of Nursing, C S I Campbell Hospital	Kadapa	Andhra Pradesh	South	103
195	Maharishi Markendeswar College of Nursing	Ambala	Haryana	North	38
196	Shivalik Institute of Nursing	Shimla	Himachal Pradesh	North	39
197	Bijupattnaik Bsc Nursing College	Takatpur	Orissa	East	15
198	Woodland Institute of Nursing	Shillong	Meghalaya	North-East	6
199	Mother Marys Institute of Nursing	Hoshiarpur	Punjab	North	40

Rank*	Nursing College	City	State	Zone	Zone Rank
200	Sitabai Nargundkar College of Nursing For Women	Nagpur	Maharashtra	West	33
201	Khalsa College of Nursing	Amritsar	Punjab	North	41
202	Gian Sagar College of Nursing	Patiala	Punjab	North	42
203	Meera Medical Institute of Nursing & Hospital	Abohar	Punjab	North	43
204	Shija Academy of Nursing Shija Hospitals & Research Institute	Imphal	Manipur	North-East	7
205	College of Nursing, Pondicherry Institute of Medical Sciences	Puducherry	Pondicherry	East	16
206	Sri Guru Arjun Dev College of Nursing	Gurdaspur	Punjab	North	44
207	Paavai College of Nursing And Research	Namakkal	Tamil Nadu	South	104
208	Mahatma Gandhi Nursing College R I I C O	Jaipur	Rajasthan	North	45
209	Padmasree College of Nursing	Kancheepuram	Tamil Nadu	South	105
210	Sri Guru Harkrishan Sahib College of Nursing	SAS Nagar	Punjab	North	46
211	Navodaya College of Nursing	Mahaboobnagar	Telangana	South	106
212	Integral College of Nursing Integral University	Lucknow	Uttar Pradesh	North	47
213	Mother Theresa School of Nursing	Hyderabad	Telangana	South	107
214	Guru Gobind Singh College of Nursing	Barnala	Punjab	North	48
215	Vivekananda Institute of Social Work & Social Science	Khurda	Orissa	East	17
216	Dhanwantri Institute of Medical Science	Jaipur	Rajasthan	North	49
217	Arawali College of Nursing	Sikar	Rajasthan	North	50
218	The Yash Foundations College of Nursing And Medical Research Institute	Ratnagiri	Maharashtra	West	34
219	Sri Aurobindo College of Nursing	Karur	Tamil Nadu	South	108
220	Biyani Institute of Scence And Management	Jaipur	Rajasthan	North	51
221	Kailash Institute of Nursing And Para Medical Sciences	Greater Noida	Uttar Pradesh	North	52

Rank*	Nursing College	City	State	Zone	Zone Rank
222	Sri Ramachandra College of Nursing	Nizamabad	Telangana	South	109
223	SRM Trichy College of Nursing	Tiruchirappalli	Tamil Nadu	South	110
224	Jyoti College of Management Science And Technology	Bareilly	Uttar Pradesh	North	53
225	St. Andrews College of Nursing	Pune	Maharashtra	West	35
226	K L E Society's Institute of Nursing Sciences	Ankola	Karnataka	South	111
227	Maharana Pratap National Institute of Nursing Education And Research	Jaipur	Rajasthan	North	54
228	Sinhgad College of Nursing	Pune	Maharashtra	West	36
229	Apollo Gleneagles Nursing College	Kolkata	West Bengal	East	18
230	St. Xavier's Catholic College of Nursing	Kanyakumari	Tamil Nadu	South	112
231	Himcapes College of Nursing	Una	Himachal Pradesh	North	55
232	College of Life Sciences Nursing Krishi Hospital Campus	Visakhapatnam	Andhra Pradesh	South	113
233	Sir C. R. Reddy College of Nursing	Eluru	Andhra Pradesh	South	114
234	St. Xavier College of Nursing	Kumbakonam	Tamil Nadu	South	115
235	College of Nursing, Hindu Rao Hospital	Delhi	Delhi	North	56
236	Jaya College of Nursing	Warangal	Telangana	South	116
237	American NRI College of Nursing	Visakhapatnam	Andhra Pradesh	South	117
238	Shrinidhi College of Health Sciences And Research	Sivaganga	Tamil Nadu	South	118
239	Aadarsh Nursing College	Dhar	Madhya Pradesh	Central	16
240	Koraput College of Nursing	Koraput	Orissa	East	19
241	Dr Jai Prakash Sharma Memorial College of Nursing	Yamuna Nagar	Haryana	North	57
242	Asram College of Nursing, Asram Hospital	West Godavari	Andhra Pradesh	South	119



Rank*	Nursing College	City	State	Zone	Zone Rank
243	Sir Hurkisondas Nurrotumdas Hospital & Research Centre College of Nursing	Mumbai	Maharashtra	West	37
244	Balaji Institute of Nursing	Warangal	Telangana	South	120
245	Patliputra College of Nursing	Patna	Bihar	East	20
246	R I M S College of Nursing R.I.M.S. Campus	Raipur	Chattisgarh	Central	17
247	Holy Cross College of Nursing	Ambikapur	Chattisgarh	Central	18
248	College of Nursing CMC Vellore, Chittoor Campus	Chittoor	Andhra Pradesh	South	121
249	Maharashtra College of Nursing	Latur	Maharashtra	West	38
250	Mayo College of Nursing	Bhopal	Madhya Pradesh	Central	19
251	Manav Nursing College	Visnagar	Gujarat	West	39
252	Ahmedabad Institute of Nursing Sciences Aims Campus	Ahmedabad	Gujarat	West	40
253	Droan College of Nursing	Udham Singh Nagar	Uttarakhand	North	58
254	College of Nursing Zydus Hospitals & Health Care Research Pvt. Ltd.	Anand	Gujarat	West	41
255	A I S E C T University Institute of Nursing	Raisen	Madhya Pradesh	Central	20
256	Shrishti Institute of Medical Science & Research	Korba	Chattisgarh	Central	21
257	St. Barnabas Hospital College of Nursing,	Ranchi	Jharkhand	East	21
258	Maharaja Agrasen College of Nursing	Hisar	Haryana	North	59
259	Sri Sai Institute of Nursing Sciences	Bhopal	Madhya Pradesh	Central	22
260	Hoskote Mission Institute of Nursing	Bangalore	Karnataka	South	122
261	Red-Crescent College of Nursing	Kozhikode	Kerala	South	123
262	Dhanbad School of Nursing, Asarfi Hospital	Dhanbad	Jharkhand	East	22
262	Dr. Ambedakar Institute of Medical Science	Rourkela	Orissa	East	22
263	Rayat-Bahra College of Nursing	Mohali	Punjab	North	60

Rank*	Nursing College	City	State	Zone	Zone Rank
264	Tirupati College of Nursing Pacific Medical University Campus	Udaipur	Rajasthan	North	61
265	Maa Kalawati Institute of Health Education And Research Centre	Ranchi	Jharkhand	East	23
265	St. Francis Hospital & College of Nursing	Ajmer	Rajasthan	North	62
266	East Coast Institute of Medical Science	Puducherry	Pondicherry	East	24
267	College of Nursing, Synod Hospital	Aizawl	Mizoram	North-East	8
268	City Nursing College	Gurdaspur	Punjab	North	63
269	Christian Institute of Health Sciences & Research College of Nursing College	Dimapur	Nagaland	North-East	9
270	Medical And Technological Institute of Nursing	Jaipur	Rajasthan	North	64
271	Sri Guru Ram Das College of Nursing	Amritsar	Punjab	North	65
272	Avadh Institute of Medical Technologies & Hospital	Lucknow	Uttar Pradesh	North	66
273	Sree Ramakrishna College of Nursing	Kulasekharam	Tamil Nadu	South	124
274	A K G Institute of Nursing	Lucknow	Uttar Pradesh	North	67
275	Sri Krishana Institute of Nursing Education And Research	Salem	Tamil Nadu	South	125
276	Hindu Mission College of Nursing	Chennai	Tamil Nadu	South	126
277	Chinmaya Advance Research Education Care	Haridwar	Uttarakhand	North	68
278	Graphic Era College of Nursing	Dehradun	Uttarakhand	North	69
279	Jagannath Gupta Institute of Nursing Sciences	Kolkata	West Bengal	East	25
280	Kalka Institute For Research & Advanced Studies	Meerut	Uttar Pradesh	North	70
281	Sister Nivedita University's Nursing Institute	Kolkata	West Bengal	East	26

Rank*	Nursing College	City	State	Zone	Zone Rank
282	Sahara College of Nursing & Paramedical Sciences (Unit of Sahara India Med Instt Ltd)	Lucknow	Uttar Pradesh	North	71
283	Galgotias School of Nursing, Galgotias University	Greater Noida	Uttar Pradesh	North	72
284	International Institute of Nursing and Research	Kalyani	West Bengal	East	27
285	Vedanti Vidya Nursing Institute	Bemetara	Chattisgarh	Central	23
286	Kalawati Nursing And Paramedical Institute	Kasganj	Uttar Pradesh	North	73
287	St. Francis College of Nursing	Indore	Madhya Pradesh	Central	24
288	Rohilkhand College of Nursing	Bareilly	Uttar Pradesh	North	74
289	Institute of Nursing, Brainware University	Kolkata	West Bengal	East	28
290	College of Nursing Nemcare Hospital North East Technical Education Society	Guwahati	Assam	North-East	10
291	College And School of Nursing	Kolkata	West Bengal	East	29
292	Dr. Anjireddy College of Nursing	Guntur	Andhra Pradesh	South	127
293	St. Martha Institute of Nursing	Guwahati	Assam	East	30
294	Mahatma Gandhi College of Nursing	Junagarh	Gujarat	West	42
295	Gayatri College of Nursing	Baripada	Orissa	East	31
296	Dhanalakshmi College of Nursing	Kannur	Kerala	South	128
297	M S Hospital And Research Centre	Lucknow	Uttar Pradesh	North	75
298	Doon Institute of Medical Science Faculty of Nursing	Dehradun	Uttarakhand	North	76
299	Jyoti Hospital Nursing College	Allahabad	Uttar Pradesh	North	77
300	St. Luke's Hospital College of Nursing	Shrirampur	Maharashtra	West	43



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## DISCIPLINE SURVEY HEALTH SCIENCES

### COURSE ASSESSED PHARMACY

#### PARAMETERS

- TEACHING LEARNING RESOURCES & PEDAGOGY (TLRP)
- RESEARCH (RS)
- FUTURE ORIENTATION (FO)
- EXTERNAL PERCEPTION & INTERNATIONAL OUTLOOK (EPIO)
- ROI

**FOR METHODOLOGY**

VISIT

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Rank*	Name of the College	City	State	State Rank
1	National Institute of Pharmaceutical Education and Research Hyderabad	Hyderabad	Telangana	1
2	National Institute of Pharmaceutical Education and Research Mohali	Mohali	Punjab	1
3	National Institute of Pharmaceutical Education and Research Ahmedabad	Gandhinagar	Gujarat	1
4	Institute of Chemical Technology	Mumbai	Maharashtra	1
5	National Institute of Pharmaceutical Education and Research Raebareli	Lucknow	Uttar Pradesh	1
6	Birla Institute of Technology & Science	Pilani	Rajasthan	1
7	National Institute of Pharmaceutical Education and Research Kolkata	Kolkata	West Bengal	1
8	National Institute of Pharmaceutical Education and Research Guwahati	Guwahati	Assam	1
9	Manipal College of Pharmaceutical Sciences	Udupi	Karnataka	1
10	Jamia Hamdard	New Delhi	Delhi	1
11	College of Pharmacy, Madras Medical College	Chennai	Tamil Nadu	1
12	Panjab University	Chandigarh	Chandigarh	1
13	JSS College of Pharmacy	Ooty	Tamil Nadu	2
14	Sri Ramachandra Institute of Higher Education and Research	Chennai	Tamil Nadu	3
15	SVKM's Narsee Monjee Institute of Management Studies	Mumbai	Maharashtra	2
16	Amrita School of Pharmacy	Kochi	Kerala	1
17	Jadavpur University	Kolkata	West Bengal	2
18	Chitkara University	Rajpura	Punjab	2
19	JSS College of Pharmacy	Mysore	Karnataka	2
20	Banasthali Vidyapith	Banasthali	Rajasthan	2
21	Dayananda Sagar University School of Pharmaceutical Sciences	Bangalore	Karnataka	3
22	Delhi Institute of Pharmaceutical Sciences & Research	New Delhi	Delhi	2
23	Poona College of Pharmacy	Pune	Maharashtra	3
23	Lovely Professional University	Phagwara	Punjab	3
24	Central University of Punjab	Bathinda	Punjab	4
25	Vishnu Institute of Pharmaceutical Education and Research	Narsapur	Telangana	2
26	College of Pharmacy, Pt. B. D. Sharma, PGIMS	Udaipur	Rajasthan	3

Rank*	Name of the College	City	State	State Rank
27	Central University of Rajasthan	Kishangarh	Rajasthan	4
28	Punjabi University	Patiala	Punjab	5
29	SVKM's Dr. Bhanuben Nanavati College of Pharmacy	Mumbai	Maharashtra	4
30	Faculty of Pharmacy - Bharath Campus (Bharath Institute of Higher Education and Research)	Chennai	Tamil Nadu	4
31	PSG College of Pharmacy	Coimbatore	Tamil Nadu	5
32	S. R. M. Institute of Science And Technology	Chennai	Tamil Nadu	6
33	Maharaja Sayajirao University of Baroda	Vadodara	Gujarat	2
34	Bombay College of Pharmacy	Mumbai	Maharashtra	5
35	Birla Institute of Technology	Ranchi	Jharkhand	1
36	KLE College of Pharmacy	Belgaum	Karnataka	4
36	Amity University Noida	Gautam Budh Nagar	Uttar Pradesh	2
37	Goa College of Pharmacy	Panaji	Goa	1
38	Padmashree Dr. D. Y. Patil Institute of Pharmaceutical Sciences and Research	Pune	Maharashtra	6
39	Nirma University	Ahmedabad	Gujarat	3
40	ADAMAS University, School of Medical Sciences	Kolkata	West Bengal	3
41	Guru Jambheshwar University of Science and Technology	Hisar	Haryana	1
42	Ramaiah University of Applied Sciences	Bangalore	Karnataka	5
42	Sam Higginbottom Institute of Agriculture, Technology & Sciences	Allahabad	Uttar Pradesh	3
43	Bharati Vidyapeeth's College of Pharmacy	Navi Mumbai	Maharashtra	7
44	N.G.S.M. Institute of Pharmaceutical Sciences	Mangaluru	Karnataka	6
45	National Institute Of Pharmaceutical Education And Research	Hajipur	Bihar	1
46	Teerthankar Mahaveer University	Moradabad	Uttar Pradesh	4
47	Parul University	Vadodara	Gujarat	4
48	Dibrugarh University	Dibrugarh	Assam	2
49	Babashheb Bhimrao Ambedkar University	Lucknow	Uttar Pradesh	5
50	Delhi Pharmaceutical Sciences and Research University	Delhi	Delhi	3
51	Sri Adichunchanagiri College of Pharmacy	B G Nagara	Karnataka	7
52	Annamalai University	Annamalai Nagar	Tamil Nadu	7

Rank*	Name of the College	City	State	State Rank
52	Dr. D.Y. Patil Institute of Pharmaceutical Science & Research	Pune	Maharashtra	8
53	Acharya & B M Reddy College of Pharmacy	Bengaluru	Karnataka	8
54	Y. B. Chavan College of Pharmacy	Aurangabad	Maharashtra	9
55	AU College of Pharmaceutical Sciences, Andhra University	Visakhapatnam	Andhra Pradesh	1
56	Shoolini University of Biotechnology And Management Sciences	Solan	Himachal Pradesh	1
57	R. C. Patel Institute of Pharmaceutical Education & Research	Shirpur	Maharashtra	10
58	ISF College of Pharmacy	Moga	Punjab	6
59	The Rashtrasant Tukadoji Maharaj Nagpur University	Nagpur	Maharashtra	11
60	Acharya Nagarjuna University College of Pharmaceutical Sciences	Guntur	Andhra Pradesh	2
61	NSHM Knowledge Campus	Kolkata	West Bengal	4
62	Chalapathi Institute of Pharmaceutical Sciences	Guntur	Andhra Pradesh	3
63	P. E. Society's Modern College of Pharmacy	Pune	Maharashtra	12
64	Sri Padmavathi Mahila Visvavidyalayam	Tirupathi	Andhra Pradesh	4
65	Arulmigu Kalasalingam College of Pharmacy	Srivilliputtur	Tamil Nadu	8
66	L. M. College of Pharmacy	Ahmedabad	Gujarat	5
67	Maharishi Markandeshwar University	Ambala	Haryana	2
68	Vels Institute of Science, Technology & Advanced Studies (Vistas)	Chennai	Tamil Nadu	9
68	Padamshree Dr. D. Y. Patil College of Pharmacy	Pune	Maharashtra	13
69	Raghavendra Institute of Pharmaceuatical Education & Research	Anantapur	Andhra Pradesh	5
70	Sri Ramakrishna Institute of Paramedical Sciences	Coimbatore	Tamil Nadu	10
71	Maharshi Dayanand University	Rohtak	Haryana	3
72	Smt. Kishoritai Bhoyar College of Pharmacy	Nagpur	Maharashtra	14
73	Guru Nanak Institute of Pharmaceutical Science & Technology	Kolkata	West Bengal	5
74	College of Pharmacy, Pt. B. D. Sharma, PGIMS	Rohtak	Haryana	4
75	Sri Venkateshwara College of Pharmacy	Chittoor	Andhra Pradesh	6
76	HIMT College of Pharmacy	Greater Noida	Uttar Pradesh	6



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## DISCIPLINE SURVEY HEALTH SCIENCES

### COURSE ASSESSED PHYSIOTHERAPY

#### PARAMETERS

- TEACHING LEARNING RESOURCES & PEDAGOGY (TLRP)
- RESEARCH (RS)
- FUTURE ORIENTATION (FO)
- EXTERNAL PERCEPTION & INTERNATIONAL OUTLOOK (EPIO)
- ROI

**FOR METHODOLOGY**

VISIT

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Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
1	Pandit Deendayal Upadhyaya National Institute for Persons with Physical Disabilities, New Delhi	New Delhi	Delhi	1	North	1
2	IMS BHU - Institute of Medical Sciences Banaras Hindu University	Varanasi	Uttar Pradesh	1	North	2
3	PGIMER Chandigarh - Postgraduate Institute of Medical Education and Research	Chandigarh	Chandigarh	1	North	3
4	SDM College of Physiotherapy, Dharwad	Hubali-Dharwad	Karnataka	1	South	1
5	NIEPMD Chennai - National Institute for Empowerment of Persons with Multiple Disabilities	Chennai	Tamil Nadu	1	South	2
6	Sri Ramachandra Institute of Higher Education and Research, Chennai	Chennai	Tamil Nadu	2	South	3
7	St John's National Academy of Health Sciences, Bangalore	Bangalore	Karnataka	2	South	4
8	Sanjay Gandhi Institute of Trauma and Orthopaedic, Bangalore	Bangalore	Karnataka	3	South	5
9	St Johns Medical College, Bangalore	Bangalore	Karnataka	4	South	6
10	BITS Institute of Physiotherapy, Vadodara	Vadodara, Alamgir	Gujarat	1	West	1
11	MMC Chennai - Madras Medical College	Chennai	Tamil Nadu	3	South	7
12	Hemwati Nandan Bahuguna Uttarakhand Medical Education University, Dehradun	Dehradun	Uttarakhand	1	North	4
13	Regional College of Paramedical Health Sciences, Guwahati	Guwahati	Assam	1	North-East	1
14	GGSIPI Delhi - Guru Gobind Singh Indraprastha University	New Delhi	Delhi	2	North	5
15	Jamia Hamdard, New Delhi	New Delhi	Delhi	3	North	6

Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
16	JMI New Delhi - Jamia Millia Islamia	New Delhi	Delhi	4	North	7
17	Dayananda Sagar College of Physiotherapy, Bangalore	Bangalore	Karnataka	5	South	8
18	Manipal University (MAHE) - Manipal Academy of Higher Education	Manipal	Karnataka	6	South	9
19	JSS College of Physiotherapy, Mysore	Mysuru	Karnataka	7	South	10
20	Dr DY Patil University, Navi Mumbai	Navi Mumbai	Maharashtra	1	West	2
21	Government Medical College and Hospital, Nagpur	Nagpur	Maharashtra	2	West	3
22	Ramaiah College of Physiotherapy	Bangalore	Karnataka	8	South	11
23	MAMC Agroha - Maharaja Agrasen Medical College	Agroha	Haryana	1	North	8
24	Sri Guru Ram Das University of Health Sciences, Amritsar	Amritsar	Punjab	1	North	9
25	AIMS Ahmedabad - Ahmedabad Institute of Medical Sciences	Ahmedabad	Gujarat	2	West	4
26	Janardan Rai Nagar Rajasthan Vidyapeeth, Udaipur	Udaipur	Rajasthan	1	North	10
27	Father Muller Institute of Medical Education and Research, Mangalore	Mangalore	Karnataka	9	South	12
28	SIMSRC Bangalore - Sapthagiri Institute of Medical Sciences and Research Center	Bangalore	Karnataka	10	South	13
29	Datta Meghe Institute of Medical Sciences, Wardha	Wardha	Maharashtra	3	West	5
30	Suryadatta Institute of Health Sciences, College of Physiotherapy (SIHS)	Pune	Maharashtra	4	West	6
31	Annamalai University, Annamalai Nagar	Chidambaram	Tamil Nadu	4	South	14
32	Apollo College of Physiotherapy, Durg	Anjora	Chhattisgarh	1	Central	1

Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
33	Acharya Institute of Health Sciences, Bangalore	Bangalore	Karnataka	11	South	15
34	GNDU Amritsar - Guru Nanak Dev University	Amritsar	Punjab	2	North	11
35	MGM Institute of Physiotherapy, Aurangabad	Aurangabad	Maharashtra	5	West	7
36	College of Physiotherapy and Medical Sciences, Guwahati	Guwahati	Assam	2	North-East	2
37	Shree Guru Gobind Singh Tricentenary University, Gurgaon	Gurgaon	Haryana	2	North	12
38	IPGMER Kolkata - Institute of Post Graduate Medical Education and Research	Kolkata	West Bengal	1	East	1
39	Meenakshi College of Physiotherapy, Chennai	Chennai	Tamil Nadu	5	South	16
40	NIMS Hyderabad - Nizams Institute of Medical Sciences	Hyderabad	Telangana	1	South	17
41	Dr APJ Abdul Kalam College of Physiotherapy, Loni	Loni	Maharashtra	6	West	8
42	DIMS Dehradun - Doon Institute of Medical Sciences	Dehradun	Uttarakhand	2	North	13
43	Integral University, Lucknow	Lucknow	Uttar Pradesh	2	North	14
44	Dr DY Patil College of Physiotherapy, Pune	Pimpri-Chinchwad	Maharashtra	7	West	9
45	Punjabi University, Patiala	Patiala	Punjab	3	North	15
46	Maharishi Markandeshwar University, Solan	Solan	Himachal Pradesh	1	North	16
47	CSJMU Kanpur - Chhatrapati Shahu ji Maharaj University	Kanpur	Uttar Pradesh	3	North	17
48	Peerless Hospital and BK Roy Research Center, Kolkata	Kolkata	West Bengal	2	East	2

Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
49	Maharashtra Institute of Physiotherapy, Latur	Latur	Maharashtra	8	West	10
50	Mother Teresa Saket College of Physiotherapy, Panchkula	Panchkula	Haryana	3	North	18
51	MAEERs Physiotherapy College, Pune	Talegaon Dabhade	Maharashtra	9	West	11
52	LPU Jalandhar - Lovely Professional University	Phagwara	Punjab	4	North	19
53	Jayoti Vidyapeeth Women's University, Jaipur	Jharna	Rajasthan	2	North	20
54	PGIMS Rohtak - Pt Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences	Rohtak	Haryana	4	North	21
55	Pt Deendayal Upadhyay Memorial Health Sciences and Ayush University of Chhattisgarh, Raipur	Raipur	Chhattisgarh	2	Central	2
56	Sharda University, Greater Noida	Greater Noida	Uttar Pradesh	4	North	22
56	National Institute of Health Education and Research, Patna	Patna	Bihar	1	East	3
57	Dr MGR Educational and Research Institute, Chennai	Chennai	Tamil Nadu	6	South	18
58	NTRUHS Vijayawada - Dr NTR University of Health Sciences	Vijayawada	Andhra Pradesh	1	South	19
59	JDT Islam College of Physiotherapy, Calicut	Calicut	Kerala	1	South	20
60	Goa Medical College, Panaji	Bambolim	Goa	1	West	12
61	Swami Vivekanand National Institute of Rehabilitation Training and Research, Cuttack	Bairoi	Odisha	1	East	4
62	Galgotias University, Greater Noida	Greater Noida	Uttar Pradesh	5	North	23

Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
63	Chaitanya Medical Foundation's College of Physiotherapy, Pune	Pimpri-Chinchwad	Maharashtra	10	West	13
64	NIMS College of Physiotherapy, Jaipur	Jaipur	Rajasthan	3	North	24
65	Teerthanker Mahaveer University, Moradabad	Bagadpur	Uttar Pradesh	6	North	25
65	Parul University, Vadodara	Waghodia	Gujarat	3	West	14
66	Hi-Tech College of Physiotherapy, Bhubaneswar	Bhubaneswar	Odisha	2	East	5
67	KLEU Institute of Physiotherapy, Belagavi	Belagavi	Karnataka	12	South	21
68	Abhilashi University, Mandi	Chail-Chowk	Himachal Pradesh	2	North	26
69	Adesh University, Bathinda	Bathinda	Punjab	5	North	27
69	Lokmanya Medical Foundation and Research Centre's College Of Physiotherapy, Pune	Pimpri-Chinchwad	Maharashtra	11	West	15
70	HIMS Dehradun - Himalayan Institute of Medical Sciences	Dehradun	Uttarakhand	3	North	28
71	BFUHS Faridkot - Baba Farid University of Health Sciences	Faridkot	Punjab	6	North	29
71	KJ Somaiya College of Physiotherapy, Mumbai	Mumbai	Maharashtra	12	West	16
72	KG College of Physiotherapy, Coimbatore	Coimbatore	Tamil Nadu	7	South	22
73	Medical Trust Institute of Medical Sciences, Cochin	Ernakulam	Kerala	2	South	23
74	SRHU Dehradun - Swami Rama Himalayan University	Dehradun	Uttarakhand	4	North	30
75	Haldia Institute of Health Sciences, Haldia	Haldia	West Bengal	3	East	6
76	Shree Swaminarayan Physiotherapy College, Surat	Kadodara	Gujarat	4	West	17

Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
77	PESIMSR Kuppam - PES Institute of Medical Science and Research	Kuppam	Andhra Pradesh	2	South	24
78	Shri Guru Ram Rai University, Dehradun	Dehradun	Uttarakhand	5	North	31
79	Narayana College of Physiotherapy, Nellore	Nellore	Andhra Pradesh	3	South	25
80	KTG College of Physiotherapy, Bangalore	Bangalore	Karnataka	13	South	26
81	BIPS Kalyani - Bengal Institute of Pharmaceutical Sciences	Kolkata	West Bengal	4	East	7
82	KM Patel Institute of Physiotherapy, Anand	Anand	Gujarat	5	West	18
83	Garden City University, Bangalore	Bangalore	Karnataka	14	South	27
84	Little Flower Institute of Medical Science and Research, Angamaly	Angamaly	Kerala	3	South	28
84	VSPM College of Physiotherapy, Nagpur	Nagpur	Maharashtra	13	West	19
85	Indore Institute of Medical Sciences, Indore	Indore	Madhya Pradesh	1	Central	3
86	Madhya Pradesh Medical Science University, Jabalpur	Jabalpur	Madhya Pradesh	2	Central	4
87	ISIC Institute of Rehabilitation Sciences, New Delhi	New Delhi	Delhi	5	North	32
88	Bareilly International University, Bareilly	Bareilly	Uttar Pradesh	7	North	33
89	Ramakrishna Mission Seva Pratishthan, Kolkata	Kolkata	West Bengal	5	East	8
90	The SIA College of Physiotherapy, Dombivli	Dombivli	Maharashtra	14	West	20
91	Rajasthan University of Health Sciences, Jaipur	Jaipur	Rajasthan	4	North	34
92	LTMMC Mumbai - Lokmanya Tilak Municipal Medical College	Mumbai	Maharashtra	15	West	21

Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
93	IIMT University, Meerut	Meerut	Uttar Pradesh	8	North	35
94	Mahatma Gandhi Missions College of Physiotherapy, Navi Mumbai	Navi Mumbai	Maharashtra	16	West	22
95	NSCBMC Jabalpur - Netaji Subhash Chandra Bose Medical College and Hospital	Jabalpur	Madhya Pradesh	3	Central	5
96	Mahatma Gandhi Physiotherapy College, Jaipur	Jaipur	Rajasthan	5	North	36
97	GMC Nagpur - Government Medical College	Nagpur	Maharashtra	17	West	23
98	KMCT College of Allied Health Science, Kozhikode	Mukkam	Kerala	4	South	29
99	TNMC Mumbai - Topiwala National Medical College and BYL Nair Charitable Hospital	Mumbai	Maharashtra	18	West	24
100	Terna Physiotherapy College, Nerul	Navi Mumbai	Maharashtra	19	West	25
101	KIMS Karad - Krishna Institute of Medical Sciences	Malkapur	Maharashtra	20	West	26
102	HIMSR New Delhi - Hamdard Institute of Medical Sciences and Research	New Delhi	Delhi	6	North	37
103	Father Muller Medical College, Mangalore	Mangaluru	Karnataka	15	South	30
104	Banarsidas Chandiwala Institute of Physiotherapy, New Delhi	New Delhi	Delhi	7	North	38
105	Jaipur National University, Jaipur	Jaipur	Rajasthan	6	North	39



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## DISCIPLINE SURVEY HEALTH SCIENCES

COURSE ASSESSED  
**PUBLIC HEALTH**

### PARAMETERS

- TEACHING LEARNING RESOURCES & PEDAGOGY (TLRP)
- RESEARCH (RS)
- FUTURE ORIENTATION (FO)
- EXTERNAL PERCEPTION & INTERNATIONAL OUTLOOK (EPIO)
- ROI

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Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
1	JIPMER Puducherry - Jawaharlal Institute of Postgraduate Medical Education and Research	Puducherry	Puducherry	1	South	1
2	JNU Delhi - Jawaharlal Nehru University	New Delhi	Delhi	1	North	1
3	Rajiv Gandhi University of Health Sciences, Bangalore	Bangalore	Karnataka	1	South	2
4	TISS Mumbai - Tata Institute of Social Sciences	Mumbai	Maharashtra	1	West	1
5	AIIMS Rishikesh - All India Institute of Medical Sciences	Rishikesh	Uttarakhand	1	North	2
6	AIIMS Jodhpur - All India Institute of Medical Sciences	Jodhpur	Rajasthan	1	North	3
7	IIPHG Gandhinagar - Indian Institute of Public Health	Ahmedabad	Gujarat	1	West	2
8	Sri Ramachandra Institute of Higher Education and Research, Chennai	Chennai	Tamil Nadu	1	South	3
9	NIMHANS Bangalore - National Institute of Mental Health and Neuro Sciences	Bangalore	Karnataka	2	South	4
10	The School of Public Health and Health Sciences, Savitribai Phule Pune University, Pune	Pune	Maharashtra	2	West	3
11	Indian Institute of Public Health, Delhi	Gurgaon	Haryana	1	North	4
12	Institute of Public Health, Kalyani	Kalyani	West Bengal	1	East	1
13	JSS Medical College, Mysore	Mysuru	Karnataka	3	South	5
14	NIE Chennai - National Institute of Epidemiology	Chennai	Tamil Nadu	2	South	6
15	National Centre for Diseases Control, New Delhi	Delhi	Delhi	2	North	5
16	All India Institute of Hygiene and Public Health, Kolkata	Kolkata	West Bengal	2	East	2
17	UNIPUNE (Pune University) - Savitribai Phule Pune University	Pune	Maharashtra	3	West	4

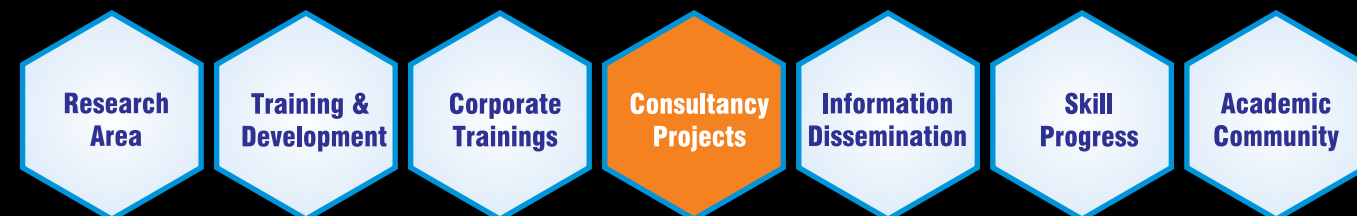
Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
18	SIHS Pune - Symbiosis Institute of Health Sciences	Pune	Maharashtra	4	West	5
19	SHUATS Allahabad - Sam Higginbottom Institute of Agriculture Technology and Science	Allahabad	Uttar Pradesh	1	North	6
20	DYPMC Pune - Dr D Y Patil Medical College Hospital and Research Centre	Pune	Maharashtra	5	West	6
21	Manipal University (MAHE) - Manipal Academy of Higher Education	Manipal	Karnataka	4	South	7
22	Karnataka State Rural Development and Panchayat Raj University, Gadag	Gadag	Karnataka	5	South	8
23	KIMS Karad - Krishna Institute of Medical Sciences	Malkapur	Maharashtra	6	West	7
24	Shree Guru Gobind Singh Tricentenary University, Gurgaon	Gurgaon	Haryana	2	North	7
25	Dr DY Patil Medical College, Navi Mumbai Medical College, Navi Mumbai	Navi Mumbai	Maharashtra	7	West	8
26	Faculty of Life and Allied Health Sciences, Ramaiah University of Applied Sciences	Bangalore	Karnataka	6	South	9
27	School of Allied Health Sciences, Dayananda Sagar University	Bangalore	Karnataka	7	South	10
28	SME Kottayam - School of Medical Education	Kottayam	Kerala	1	South	11
29	KUHS Thrissur - Kerala University of Health Sciences	Thrissur	Kerala	2	South	12
30	NSHM Kolkata - NSHM Knowledge Campus	Kolkata	West Bengal	3	East	3
31	Pravara Institute of Medical Sciences, Loni	Loni	Maharashtra	8	West	9
31	Center for Social Medicine, Pravara Institute of Medical Sciences, Loni	Loni	Maharashtra	9	West	10
32	Yenepoya Medical College, Mangalore	Mangalore	Karnataka	8	South	13



Rank*	Name of the College	City	State	State Rank	Zone	Zone Rank
33	SCTIMST Trivandrum - Sree Chitra Tirunal Institute for Medical Sciences and Technology	Thiruvananthapuram	Kerala	3	South	14
34	University of Hyderabad, Hyderabad	Hyderabad	Telangana	1	South	15
35	IIHMR University, Jaipur	Jaipur	Rajasthan	2	North	8
36	Lucknow University - University of Lucknow	Lucknow	Uttar Pradesh	2	North	9
37	Amity University Gurgaon - Amity University	Gurugram	Haryana	3	North	10
38	KSHEMA Mangalore - KS Hegde Medical Academy	Mangaluru	Karnataka	9	South	16
39	School of Public Health, SRM Institute of Science and Technology, Kattankulathur	Kattankulathur	Tamil Nadu	3	South	17
40	Amity University, Noida	Noida	Uttar Pradesh	3	North	11
41	Parul Institute of Public Health, Vadodara	Waghodia	Gujarat	2	West	11
42	Global Institute of Public Health, Thiruvananthapuram	Thiruvananthapuram	Kerala	4	South	18
43	Vinayaka Missions University - Vinayaka Mission's Research Foundation	Salem	Tamil Nadu	4	South	19
44	Sri Devaraj Urs Medical College - Sri Devaraj Urs Academy of Higher Education and Research	Kolar	Karnataka	10	South	20
45	RMLAU Faizabad - Dr Ram Manohar Lohia Avadh University	Faizabad	Uttar Pradesh	4	North	12
46	Institute of Clinical Research India, Delhi	New Delhi	Delhi	3	North	13
47	Maulana Azad University, Jodhpur	Jodhpur	Rajasthan	3	North	14
48	Martin Luther Christian University, Shillong	Shillong	Meghalaya	1	North East	1
49	Eternal University, Sirmour	Sirmour	Himachal Pradesh	1	North	15



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**Shiv S. Sharma**  
Founder, Education Post  
(Secretary, FWA)

## YOUR SOLUTION - OUR PRIORITY

Does someone drive in only one lane on the road, on your way to home? Probably NOT, then why to let students think of only 'conventional-but-crowded' courses? Education Post clearly and solemnly believes in "PROVIDING SOLUTIONS" to our youth, students and their parents.

In the section of Futuristic Courses, we present those courses that are unconventional, less popular, but they are so necessary for our nation that studying them will not only give our nation a skilled workforce, but also those futuristic courses will bolster students' career, 'ALWAYS' and for perpetuity.

Here are four such streams for students who are studying physics, chemistry and biology (PCB in short) and want to thrive in the medical and healthcare domain.

## BIO AND MEDICAL INSTRUMENTATION A VITAL STREAM

When it comes to serious disease, e.g. kidney stone, can any doctor detect without the help of ultra-sound machine? Or can a by-pass surgery be accomplished without stent? The answer is a big NO. For those students who have chosen biology in their 12<sup>th</sup> class and thinking to make a career in the medical sector, bio-instrumentation or the field that deals with the medical instrumentation is another unconventional-cum-potential stream in the higher education.

Today, we set sail to explore one such jewel that merges the wonders of biology and micro-electromechanical systems (MEMS) - BIO-MEMS. Hold your breath as we dive into this captivating fusion of science and technology, a course that promises to unlock the mysteries of life on a microscopic level.

### Course Overview

BIO-MEMS, short for (Bio-Micro Electro Mechanical Systems) is a cutting-edge interdisciplinary field of study where biology and engineering converge. This course teaches about the design, fabrication, and application of tiny and very sophisticated devices that bridge the gap between biology and engineering. Through a captivating blend of lectures, laboratory work, and hands-on projects, students are aimed to explore the vast potential of this nascent but highly promising course.

Picture yourself crafting intricate structures on a microscopic scale, seamlessly blending the principles of biology, material science, and Chemical engineering. BIO-MEMS opens the door to manipulating biological systems, such as cells, tissues, and even organs, through the application of microscale devices, sensors, and actuators.

### Career Opportunities

The world of BIO-MEMS is a land of boundless opportunities, where trailblazing graduates can embark on

diverse career paths. As a BIO-MEMS specialist, you could be at the forefront of groundbreaking medical research, contributing to the development of cutting-edge medical devices like lab-on-a-chip systems, smart implants, and drug delivery systems.

For the environmentally conscious pioneers, BIO-MEMS also offers avenues in sustainable agriculture, where microfluidic systems aid in precision farming and resource optimization. The field also extends its embrace to the realm of environmental monitoring, where miniature sensors help monitor pollution levels and preserve our planet's well-being.

### Specializations and Electives

Within the captivating realm of BIO-MEMS, students have the opportunity to embark on various specialized journeys. Whether your passion lies in biomedical devices, environmental applications, or bio-inspired robotics, this course allows you to tailor your learning experience.

Furthermore, electives in genetic engineering, biomaterials, and bioinformatics add a multidimensional facet to your knowledge, equipping you with a diverse skill set coveted by industries around the globe.

### Internship and Practical Training

No educational voyage is complete without hands-on experiences that test the waters of real-world challenges. With BIO-MEMS, students are provided ample opportunities for internships and practical training with esteemed research institutions, biomedical companies, and technology giants. Imagine yourself working side by side with seasoned experts, bringing your theoretical knowledge to life and making a tangible impact in the world.

### Prominent Institutions in India

In India, several esteemed educational institutions offer this

course, ensuring students receive top-notch education and guidance. Among these are:

1. Indian Institute of Technology (IIT) Bombay
2. IIT Madras
3. National Institute of Technology (NIT) Karnataka
4. Manipal Institute of Technology, Manipal
5. VIT University, Vellore
6. SRM Institute of Technology, Noida
7. Amity Institute of Nanotechnology, Noida
8. Satyabhama Institute of Science and Technology, Chennai

As we bid adieu to the uncharted waters of BIO-MEMS, we leave you with a call to action. If you seek to unravel the mysteries of life through the lens of technology, if you yearn to create a meaningful impact in the fields of medicine, agriculture, and environmental preservation, then BIO-MEMS is your vessel to success.

Step forward, brave souls, and seize the opportunity to be pioneers in a realm where possibilities are as vast as the cosmos. Let the pages of your future be inscribed with the wonders of BIO-MEMS, an enchanting journey that beckons you to embark on today!

## GENETICS DELVE INTO THE DNA

Step into the captivating world of Genetics, as we bring you one of the very interesting fields of study where the mysteries of life are unraveled and the blueprint of existence is unveiled. Now, embark on this thrilling journey of discovery, come along with us as we delve deep into this enigmatic field, offering immense potential for aspiring young minds.

### Introduction:

Genetics, which is the science of heredity and variation, provides a profound understanding of the genetic diversities of organisms. This curriculum covers a wide range of subjects, which includes molecular genetics, population genetics, genomics, bioinformatics, and gene editing techniques. Talking about this curriculum, as empower students to explore the very building blocks of life - DNA - and how it influences traits, diseases, and evolution. Basically, this course will provide you all with a strong foundation for further scientific exploration and research in the field of genetics.

### Career Opportunities:

A degree with knowledge about Genetics offers up a plethora of rewarding career paths. The fresh graduates can opt for the role of genetic counselors, research scientists, biotechnologists, clinical geneticists, and genetic engineers. This domain seeks only innovative minds because of personalized medicines and the recent advancements in genetic technologies.

### Specializations and Electives:

Talking about the specializations and electives in this career, Genetics offers exciting opportunities in many different sectors, such as medical genetics, forensic genetics, agricultural genetics, and evolutionary genetics. Many a student also tailor their learning experiences by selecting from a range of electives, which includes gene therapy, epigenetics, and human genomics, according to individuals' interests.

### Prominent Institutions in India:

India boasts top-notch institutions that nurture aspiring geneticists. The Institutions that provide this course are:

1. Indian Institute of Science (IISc) Bangalore,
2. National Centre for Biological Sciences (NCBS),
3. Tata Institute of Fundamental Research (TIFR), and
4. Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR)
5. Institute of Genetic Engineering, Kolkata
6. AIMS, Bangalore
7. Chandigarh University, Chandigarh

### Conclusion:

As healthcare, agriculture, and industry progress, Genetics emerges as a vital lynchpin, ushering in ground-breaking advancements and promising a brighter future for humanity. Embracing this course not only fuels personal growth but also empowers individuals to significantly contribute to the nation's well-being.

Beyond its impact on healthcare and agriculture, Genetics finds profound relevance in the government sector. Understanding genetic diversity and inheritance patterns can aid in formulating policies for biodiversity conservation and sustainable agriculture. It strengthens forensic sciences, enhancing criminal investigations and justice delivery.

*Embrace Genetics, Embrace the Future! Explore the secrets of life and become the architects of tomorrow!*

# MICRO-BIOLOGY

## STREAM THAT GAVE COVID-19 VACCINE

**M**ore than 2.2 billion Covid-19 vaccination has been registered so far in India. It simply means that almost every Indian has received their all the necessary doses of Covid-19 vaccine. Along with two Indian vaccines: Covishield, Covaxine, Indians have been receiving 10 others vaccines that were developed by other countries or foreign organizations.

**But anyone ever wondered who or what kind of experts devise vaccines? The answer is Microbiologist.** From vaccines of polio to cholera or hepatitis-B or any of those diseases that were/are contagious, it is the contribution of microbiologist who works hard to invent a vaccines for disease that are because of virus, fungi, or protozoa.

Microbiology is a field that examines the unseen world of microorganisms. From understanding infectious diseases to developing life-saving medications, this course plays a pivotal role in numerous scientific advancements. Join us as we explore the ins and outs of Microbiology, shedding light on its course overview, career opportunities, specializations, and prominent institutions in India.

### Course Overview:

Microbiology is a multidisciplinary branch of biology that focuses on studying microorganisms such as bacteria, viruses, fungi, and parasites. This course equips students with a comprehensive understanding of the structure, function, and behavior of these microscopic organisms. Students explore into areas such as microbial genetics, immunology, virology, microbial physiology, and microbial ecology.

### Career Opportunities:

Microbiology is a path that opens up a vast array of career opportunities in many different sectors. Fresh graduates can find employment in different industries like Pharmaceutical companies, research laboratories, food and beverage industries, environmental industries, healthcare organizations, and many government agencies. Microbiologists are involved in various roles, including research scientists, laboratory technicians, quality control analysts, clinical microbiologists, epidemiologists, and biotechnologists.

### Specializations and Electives:

Microbiology offers numerous specializations and electives, enabling students to focus on specific areas of interest. Some popular specializations within Microbiology include medical microbiology, industrial microbiology, environmental microbiology, agricultural microbiology, and microbial biotechnology. These specializations allow students to gain expertise in their chosen field and pursue careers aligned with their interests and aspirations.

### Internship and Practical Training:

Internships and practical training play a crucial role in a Microbiology program. Students are provided with hands-on experience in laboratory settings, allowing them to apply theoretical knowledge to real-world scenarios. These practical sessions enhance skills in microbial culturing, identification techniques, biochemical assays, and data analysis. Internship opportunities are often available in research institutions, healthcare facilities, and industrial laboratories, offering students exposure to the practical aspects of microbiological work.

### Prominent Institutions in India:

India boasts several renowned institutions that offer Microbiology courses, known for their academic excellence and research contributions. Some prominent institutions include:

1. All India Institute of Medical Sciences (AIIMS), New Delhi
2. Indian Institute of Science (IISc), Bangalore
3. Jawaharlal Nehru University (JNU), New Delhi
4. University of Delhi (DU), Delhi
5. Tata Institute of Fundamental Research (TIFR), Mumbai
6. Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh
7. Christian Medical College (CMC), Vellore

Microbiology, with its vast applications and contributions to various sectors, presents an exciting and promising career path for aspiring students. By pursuing a course in Microbiology, students can explore the intricacies of the microscopic world and can contribute to advancements in healthcare, biotechnology, and environmental sciences. With a range of specializations, hands-on training opportunities, and renowned institutions, it is a field that holds immense potential for those passionate about unraveling the mysteries of life at its smallest scale.

### Future Need:

Covid-19 pandemic undoubtedly caused plethora of trouble to the whole world, and that's the reason it was labeled as 'pandemic,' but every catastrophe teaches many lessons and so did Covid-19.

Thanks to the pandemic that today, molecular labs, virology labs, pharmaceutical, vaccine and biological diagnosis organizations and many other organizations are desperately seeking microbiologists for their organization, not only in India, even around the whole world. So, a growing career is inevitable if a student opts for microbiology in their graduation/post-graduation. In a nutshell, why to limit oneself only to NEET, MBBS, MD, BAMS, BHMS or even B.Pharma/M. Pharma, while all of them need those who invent vaccines for the better and curable world.

# PHARMACOLOGY

## STUDY OF EFFECTS OF MEDICINE ON BODY

### Introduction:

No one is disease-free today. People often get headache or stomach-ache or any other disease or ailment. What do they do in those situations? They take medicine, tablets, capsules, injections and all the 'cure' things from an apothecary. Study of 'effect of different medicines,' their salt or chemical-compositions is the branch of Pharmacology while the study of Pharmacy deals in preparation and devising new salt-compositions.

Pharmacology is another 'unconventional-less explored-but potential' course in the higher education that students definitely must consider opting for their career. Bachelor/Masters in 'Pharmacy' (B.Pharma and M.Pharma.) has already attracted a sufficient crowd in India. While

### Course Overview:

Pharmacology, as we say, is the science of understanding how drugs react with the human body to treat diseases and improve health. This course offers a comprehensive understanding of drug development, its mechanisms of action, and its impact on various physiological systems.

Its curriculum takes one on an enlightening journey through the intricate web of drug discovery, development, and regulatory processes. From molecular pharmacology to clinical trials, you will be equipped with a versatile skill set that forms the foundation of modern medicine.

### Career Opportunities:

The cosmos of Pharmacology is a treasure trove of opportunities waiting to be unlocked. Fresh graduates will find themselves in high demand across a spectrum of industries in the near future. You can become research scientists, working tirelessly to unveil new therapeutic options, or clinical pharmacologists, aiding in the safe and effective use of drugs.

This pharmaceutical industry is eagerly waiting for these experts to drive innovation and bring life-changing drugs to market. And for those who have a passion for academia, teaching and research positions at prestigious institutions can offer a chance to inspire future generations.

### Specializations and Electives:

As the field of Pharmacology is constantly growing, it is offering various opportunities for specialization. Students can focus on areas like neuropharmacology or cardiovascular pharmacology, aligning their education to cope with their interests.

Elective courses, such as drug toxicology, pharmacogenomics,

and drug delivery systems, offer a comprehensive understanding of specific aspects of pharmacology, providing graduates with a diverse knowledge base.

### Internship and Practical Training:

Internships at research institutions and pharmaceutical companies offer a peek into the charismatic industry, allowing students to apply their knowledge in a practical manner. These experiences will foster invaluable skills and will be nurturing the next generation of pharmacological pioneers.

### Prominent Institutions in India:

India boasts a lineup of esteemed educational institutions that offer world-class Pharmacology programs. These institutions pave the way for students to embark on a transformative academic journey.

1. All India Institute of Medical Sciences (AIIMS)
2. Jamia Hamdard, New Delhi
3. NIPER Ahmedabad
4. Panjab University, Chandigarh
5. University of Mumbai, Mumbai
6. Osmania University, Hyderabad
7. Manipal Academy of Higher Education, Manipal
8. JSS College of Pharmacy, Ooty
9. Bombay College of Pharmacy, Mumbai
10. Sardar Patel College of Pharmacy, Mumbai

### Also, Contribution to the Nation and Governments:

Pharmacology plays an essential role in shaping the health landscape of a country or nation. With the production of skilled pharmacologists, a nation can boost its pharmaceutical research and development capabilities, leading to the creation of novel drugs that pander to specific diseases prevalent in the region.

Till today, government healthcare agencies and regulatory bodies rely on pharmacologists to ensure the safety and efficacy of drugs introduced into the market. The expertise of pharmacologists in assessing and managing drug interactions and adverse effects is indispensable in safeguarding public health.

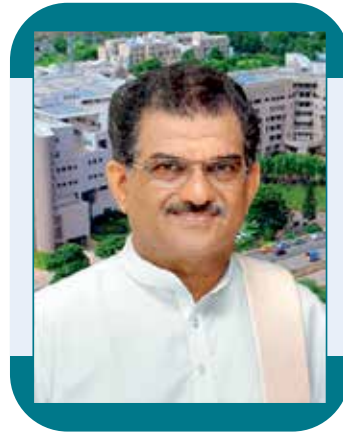
In a nutshell, by choosing a career in Pharmacology, students DEFINITELY empower themselves, as it is more in demand now, having lesser crowd, and contribute significantly to the well-being of the nation and its people.

## Shri Dharmasthala Manjunatheshwara University (SDM University):

SDM University was established on 19<sup>th</sup> December 2018 as a State Private University at Sattur, Dharwad under Karnataka Act No.19 of 2018. This University has been sponsored by Shri Dharmasthala Manjunatheshwara Educational Society (SDM Educational Society), Ujire, Dakshina Kannada District, Karnataka State. The Chancellor of this University is Poojya Shri D. Veerendra Heggade who is also the President of SDM Educational Society and Dharmadhikari (the Head) of Shree Kshetra Dharmasthala. SDM Educational Society runs over 55 Educational Institutions, having the Academic Streams Medicine, Dentistry, Physiotherapy, Nursing, Biomedical Sciences, Engineering, Management, Law, Ayurveda, Naturopathy and Social Sciences which adds glory to SDM University and SDM Educational Society.

SDM University sets the highest standards of teaching and learning, awakening the intelligence of the students and nurturing the creativity hidden in them by creating an environment where the ancient wisdom blends with modern science to transform them into human being to face the challenges.

The University functions with the mission to ensure the journey of education is inspiring, pleasant and enjoyable to attract best of the Teachers and Students. The objective of the University is to transform the students of today to be a Leaders of tomorrow, a better human being and to produce passionate teachers.



**Poojya Shri D. Veerendra Heggade**  
Hon'ble Chancellor &  
Rajya Sabha Member (GOI)

### The Visionary Leader:

The SDM Group of Educational institutions runs various parts of Karnataka with the excellent visionary leadership of the Chancellor of the University, Poojya Shri D. Veerendra Heggade. He is a multi-faceted personality with over 5 decades of vast experience in the varied fields as religious head, social reformer, philanthropist, philosopher and educationist.

### Awards & Recognitions:

Poojya Shri D. Veerendra Heggade has been bestowed with the second highest civilian award of the Country, the Padma Vibhushan, the highest civilian award of the State, Karnataka Rathna, the Rajashri Award, Honorary Doctorates from different Universities are the various jewels at his crown.



Scan for  
more Information

Constituent Institutions of  
SDM University

## Courses Offered

### SDM COLLEGE OF MEDICAL SCIENCES & HOSPITAL DHARWAD (Recognized by NMC, New Delhi)

#### BACHELOR OF MEDICINE & BACHELOR OF SURGERY (MBBS) DOCTOR OF MEDICINE (MD)

- ▶ Anatomy
- ▶ Anesthesiology
- ▶ Biochemistry
- ▶ Community Medicine
- ▶ Dermatology
- ▶ Emergency Medicine
- ▶ Forensic Medicine
- ▶ General Medicine
- ▶ Microbiology
- ▶ Paediatrics
- ▶ Pathology
- ▶ Pharmacology
- ▶ Physiology
- ▶ Psychiatry
- ▶ Radio-diagnosis
- ▶ Hospital Administration
- ▶ Respiratory Medicine

#### MASTER OF SURGERY (MS)

- ▶ General Surgery
- ▶ Obstetrics & Gynecology
- ▶ Orthopedics
- ▶ Otorhinolaryngology
- ▶ Ophthalmology

#### DIPLOMA

Public Health

#### DOCTORATE OF MEDICINE (DM)

Nephrology

#### MASTER OF CHIRURGIAE (M.Ch.)

- ▶ Plastic & Reconstructive Surgery
- ▶ Paediatrics Surgery

#### FELLOWSHIP PROGRAMS IN MEDICAL FACULTY

- ▶ Neonatal Intensive Care
- ▶ Minimally Invasive Surgery (Gynaecology)
- ▶ Rhinology
- ▶ Reproductive Medicine
- ▶ Consultation-Liaison Psychiatry
- ▶ Orthopaedic Trauma

#### B.Sc. MEDICAL ALLIED SCIENCE COURSES:

- ▶ Renal Dialysis Technology
- ▶ Medical Lab Technology
- ▶ Medical Imaging Technology
- ▶ Optometry
- ▶ OT Technology
- ▶ Anaesthesia Technology
- ▶ Emergency and Trauma Care Technology
- ▶ Medical Records Technology
- ▶ Respiratory Therapy

#### BACHELOR IN AUDIOLOGY AND SPEECH LANGUAGE PATHOLOGY

#### CERTIFICATE COURSES IN ALLIED SCIENCES (POST CMLT/ DMLT/ B.Sc.)

- ▶ Blood Bank Technology
- ▶ Histo - Technician
- ▶ Advanced Cert. in Medical Micro. Lab. Technology

### SDM COLLEGE OF DENTAL SCIENCES & HOSPITAL, DHARWAD (Recognized by DCI, New Delhi)

#### BACHELOR OF DENTAL SURGERY (BDS)

#### MASTER OF DENTAL SURGERY (MDS)

- ▶ Conservative Dentistry
- ▶ Oral & Maxillofacial Surgery
- ▶ Oral Medicine & Radiology
- ▶ Oral Pathology
- ▶ Orthodontics
- ▶ Pedodontics
- ▶ Periodontics
- ▶ Prosthodontics
- ▶ Public Health Dentistry

#### FELLOWSHIP PROGRAMMES IN DENTAL FACULTY

- ▶ Cleft Lip & Palate (Oral Surgery)
- ▶ Forensic Odontology
- ▶ Oral Implantology

#### CERTIFICATE COURSES IN DENTAL FACULTY (POST BDS):

- ▶ Forensic Odontology
- ▶ CAD CAM Dentistry
- ▶ Fundamentals of Digital Dentistry

### SDM COLLEGE OF PHYSIOTHERAPY, DHARWAD

(Recognized by Govt. of Karnataka)

#### BACHELOR OF PHYSIOTHERAPY (BPT)

#### MASTER OF PHYSIOTHERAPY (MPT)

- ▶ Musculoskeletal Disorders
- ▶ Sports
- ▶ Paediatrics
- ▶ Cardiorespiratory Disorders
- ▶ Community Physiotherapy
- ▶ Obstetrics & Gynecology (OBG)
- ▶ Neurological and Psychosomatic Disorders

### SDM INSTITUTE OF NURSING SCIENCES, DHARWAD

(Recognized by Indian Nursing Council, New Delhi)

#### BACHELOR OF SCIENCE NURSING (B.Sc.)

#### MASTER OF SCIENCE NURSING (M.Sc.)

- ▶ Medical Surgical Nursing
- ▶ Community Health Nursing
- ▶ Nursing in Psychiatry
- ▶ Child Health Nursing
- ▶ Obstetrics & Gynecology (OBG)

#### DIPLOMA IN NURSING (GENERAL NURSING & MIDWIFERY)

### SDM RESEARCH INSTITUTE FOR BIOMEDICAL SCIENCES DHARWAD

#### M.Sc. in BIOMEDICAL SCIENCE

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- ▶ Medicine
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- ▶ Physiotherapy
- ▶ Nursing
- ▶ Biomedical Sciences

6<sup>th</sup> Floor, Manjushree Building, SDM College of Medical Sciences & Hospital  
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# VISIT MAURITIUS



Ministry of Tourism  
Republic of  
Mauritius

## MATHEMATICS CHALLENGE

### CMT - SERIES PROBLEMS - by GANIT MATH (गणित मठ)

#### CMT-2020/ 42 :

If  $m = (x^7 + y^7) \div (x^5 + y^5)$  and  $n = a^2 + b^2$ ,

where,

$$x + y = 3; x^2 + y^2 = 1;$$

$$a^2 b^{-1} u + a^{-1} b^2 v = 1; u : v :: a^{-1} : b^{-1};$$

$$\text{and } \left[ \sqrt{u^2 + v^2} - (u^2 - v^2) \div \sqrt{u^2 + v^2} \right] = 2v^2,$$

then,

$$\left( \frac{4(m+n)^2}{mn} - 16 \right) \left( \frac{(m+n)^2 - mn}{mn} \right) \div \left( \frac{m^3 + n^3}{mn} \right) = ?$$

#### CMT-2020/ 43 :

If  $\alpha, \beta$ , and  $\gamma$  are natural numbers such that :

$$\frac{\alpha + \sqrt{\alpha^2 - 1}}{\alpha - \sqrt{\alpha^2 - 1}} + \frac{\alpha - \sqrt{\alpha^2 - 1}}{\alpha + \sqrt{\alpha^2 - 1}} = 482;$$

$$\frac{\beta + \sqrt{\beta^2 - 1}}{\beta - \sqrt{\beta^2 - 1}} + \frac{\beta - \sqrt{\beta^2 - 1}}{\beta + \sqrt{\beta^2 - 1}} = 1154$$

$$\frac{\gamma + \sqrt{\gamma^2 - 1}}{\gamma - \sqrt{\gamma^2 - 1}} + \frac{\gamma - \sqrt{\gamma^2 - 1}}{\gamma + \sqrt{\gamma^2 - 1}} = 2114$$

$$\text{then } \frac{\alpha^3(\beta - \gamma) + \beta^3(\gamma - \alpha) + \gamma^3(\alpha - \beta)}{\alpha^2\beta - \alpha^2\gamma + \beta^2\gamma - \beta^2\alpha + \gamma^2\alpha - \gamma^2\beta} = ?$$

#### ANSWERS :

CMT-2020/41: 1

Answers will be published in the next issue . You can ask any queries and send your solution to Email : ganitmath.india@gmail.com , M: +91 8826337312, 9711733366, Website : www.ganitmath.in  
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I highly recommend all the young learners to solve Mental Maths Workbook (by Ganit Math Publications)

- Saanvi Puri

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1. JSTSE, NTSE
2. KVPY SA, KVPY SX (AIR- 198)
3. JEE MAIN(PERCENTILE:99.42)
4. CBSE X: 98.6%, CBSE XII: 99.25% (PCMB)
5. NEET UG 2022 AIR- 368 (690/720)
6. NEET Physics: 180/180; CBSE X, XII Maths- 100/100
7. JEE ADV. AIR 3354



SAANVI PURI  
... a student of  
गणित मठ

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»» Emergency & Trauma Care

Technology

»» B.Sc Renal Dialysis Technology

»» Cardiac Care Technology

»» Optometry

##### MPH

#### College of Nursing Sciences

##### PB B.Sc Nursing

##### B.Sc Nursing

##### M.Sc.Nursing

#### College of Physiotherapy

##### BPT

##### MPT

#### College of Pharmaceutical Sciences

##### Pharm. D.

##### B. Pharm

##### M. Pharm

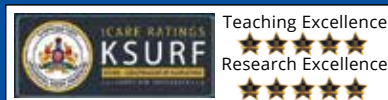
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