

PRESS RELEASE

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NUS enhances undergraduate healthcare education to future-proof Singapore's healthcare system

- ***Common curriculum for Dentistry, Medicine, Nursing and Pharmacy undergraduates to increase intellectual breadth and depth, and foster interprofessional collaboration***
- ***New Minor in Biomedical Informatics for Medicine students***
- ***New Minor in Integrative Health for students from other disciplines***

Singapore, 15 August 2023 — The National University of Singapore (NUS) has introduced three initiatives to further enhance the training of future-ready health professionals to meet Singapore's evolving care needs. This timely repositioning of the University's healthcare education tailors the development of healthcare talents in response to Singapore's 'Healthier SG' vision, a new national initiative focusing on integrated and preventive care.

The 'Healthier SG' vision entails a major reform of the healthcare system to facilitate ageing in place through the use of technology and analytics. This requires doctors, nurses, dentists and pharmacists to work together to support and holistically care for the community in all aspects of their healthcare needs. Interdisciplinary training and the breaking of siloes in healthcare provision will, therefore, be critical.

Future doctors, nurses, dentists, pharmacists, and professionals trained by NUS will need to be equipped with the knowledge, skills, and attitudes to help shape a resilient and responsive healthcare system in Singapore. For example, besides strong clinical training, future doctors can better serve their patients by providing integrated care alongside other health professionals. They can also harness AI and data science to analyse patient risks, needs and diagnoses for more informed decisions on clinical and healthcare options.

Starting from August 2023, NUS has implemented a new interdisciplinary common curriculum for undergraduates in Dentistry, Medicine, Nursing and Pharmacy. The new Common Curriculum for Healthcare Professional Education has been carefully crafted to ensure that the learning outcomes are aligned with the 'Healthier SG' vision.

About 870 first-year students from Dentistry, Medicine, Nursing and Pharmacy will be taking five specially-designed courses together, and they will collaborate across the four healthcare disciplines as part of their learning journey. The common curriculum, which is to be completed in the first two years of their candidature, will complement the existing curriculum of the respective degree programmes.

In conjunction with the new Common Curriculum for Healthcare Professional Education, the NUS Yong Loo Lin School of Medicine (NUS Medicine) has also enhanced its curriculum for Medicine undergraduates by implementing a Minor that delves into Artificial Intelligence (AI) and Biomedical Informatics, to better prepare students for the new era of AI-driven digital medicine. Medical students will need to complete this Minor during their undergraduate candidature.

Students from other NUS faculties, schools and colleges will also have the opportunity to acquire knowledge about the workings of modern healthcare systems through a new Minor in Integrative Health.

Professor Aaron Thean, NUS Deputy President (Academic Affairs) and Provost, said, “This latest effort to imbue interdisciplinary perspectives in healthcare education aims to better prepare our graduates for enriching careers in a fast-changing world. As Singapore’s healthcare needs evolve rapidly, an interdisciplinary approach becomes increasingly relevant. We need to increase our efforts to foster interprofessional collaboration across the healthcare sector and adjacent fields such as business, engineering, law and social sciences. We believe that this is important to prepare our students to be future-ready for the many healthcare professions, thus contributing positively to quality health services for Singaporeans.”

“Health and well-being are more than just caring for the sick. To help people stay healthy as long as they live, and better care for them when they are ill, we need to look beyond the traditional confines of medicine and science, and draw upon other disciplines. Health sciences education should prepare tomorrow’s doctors, nurses, dentists and pharmacists to harness the power of artificial intelligence, computing, business analytics, even music and the arts, in the provision of holistic, patient-centric healthcare,” said Professor Chong Yap Seng, Dean of NUS Yong Loo Lin School of Medicine.

(1) NUS Common Curriculum for Healthcare Professional Education

The specially curated two-year common curriculum draws on the academic content from Dentistry, Medicine, Nursing, and Pharmacy. It comprises five courses, with each course to be completed within 13 weeks.

This cross-disciplinary curriculum seeks to cultivate in students from Dentistry, Medicine, Nursing, and Pharmacy the awareness of social issues and their impact on health, teamwork, communication skills, professionalism, digital literacy, and interprofessional education. Lessons are conducted through blended learning with a mix of online and in-person classes. These classes will be customised to feature group as well as individual learning sessions such as case-based discussions, fireside chats and self-reflections.

A key content pillar in the Common Curriculum is the *Social and Behavioural Determinants of Health* pillar, which will educate healthcare students on the practical, social and emotional needs that affect individuals’ health and wellbeing in communities. This pillar forms the foundation for the other four content pillars, which will cover areas such as professionalism and ethical practice, teamwork and communication skills, as well as data and digital literacy.

The Common Curriculum prepares healthcare students for population healthcare planning, delivery and evaluation. It also equips them with design thinking and collaborative skills to engage in interprofessional interactions.

Students will also engage in interdisciplinary experiential learning through the *Longitudinal Patient Experience*, where teams of students from various healthcare disciplines will visit patients in their homes and living environments continually for one year. This immersive learning journey provides students with opportunities to apply the concepts learnt in class to

provide holistic care for their patients. At the same time, it fosters empathy and resilience in the students.

“I attended the pilot session for the common healthcare curriculum in August 2022. It was eye-opening to learn that we should adopt a multi-faceted approach to health, and not view health as merely a physical condition or illness. It was also interesting to understand how non-medical factors, such as social and environmental factors, play an important role in how doctors view and manage a patient’s health. This will be an essential skill for me as a doctor in future,” said Ms Yunn Honey Aye Kyaw, Phase II student at NUS Medicine.

She added, “Personally, the course, ‘Social and Behavioural Determinants on Health’, which delved into the topic on health in vulnerable groups, stood out for me. It highlighted the various barriers vulnerable patients face, such as the social, economic, environmental or political aspects of their lives, which affect how they receive care. These sessions have allowed me to reflect how I can be a better advocate for health, and reinforced the importance of being empathetic towards my future patients.”

Please refer to [Annexe 1](#) for more information about the Common Curriculum.

(2) Minor in Biomedical Informatics

Biomedical informatics holds tremendous potential in the healthcare system. It harnesses data and technology to improve patient care, advance medical research, enhance population health management, and in turn, shapes the future of healthcare delivery.

The Minor in Biomedical Informatics offered by NUS Medicine combines healthcare, data science, artificial intelligence, and information technology to provide medical students with the necessary knowledge and skills to stay ahead of the healthcare curve.

Students will develop skills in large language models, data management, health information systems, biomedical data analysis, and medical decision support systems. They will also learn core skills such as evidence-based clinical decision-making, effective communication, strategic leadership, and entrepreneurship.

All first-year medical students in the current Academic Year 2023/2024 are required to complete this Minor during their undergraduate candidature.

Please refer to [Annexe 2](#) for more information on the new Minor in Biomedical Informatics.

(3) Minor in Integrative Health

A major aspect of integrative health involves the provision of optimal health and wellness, which will rely on advancements in areas such as healthcare technologies, environmental and building design, psychological care, data analytics, health economics, and healthcare innovations.

The new Minor in Integrative Health, which is open to first, second and third-year undergraduate students from non-healthcare disciplines from Academic Year 2023/2024, aims to educate and inspire students to lead, implement, and coordinate health-promoting research and development efforts using an interdisciplinary and cross-domain approach. Students will also cultivate an interdisciplinary mindset to solve complex health issues, and enhance individual and population health.

This Minor is offered by NUS Medicine, together with academic units such as the Department of Information Systems and Analytics at the NUS School of Computing, as well as the

Department of Architecture, Division of Industrial Design, and Department of The Built Environment at NUS College of Design and Engineering. It is also designed in consultation with NUS Centre for Future-ready Graduates and industry partners from sectors such as healthcare, medical technology, pharmaceuticals, consulting, design, architecture, and facilities management.

Students will complete a total of five courses over two years or more. The inaugural cohort will comprise 50 students with the prospect of increasing the intake over the next three years.

Please refer to [Annexe 3](#) for more information on the new Minor in Integrative Health.

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About National University of Singapore (NUS)

The National University of Singapore (NUS) is Singapore's flagship university, which offers a global approach to education, research and entrepreneurship, with a focus on Asian perspectives and expertise. We have 16 colleges, faculties and schools across three campuses in Singapore, with more than 40,000 students from 100 countries enriching our vibrant and diverse campus community. We have also established our NUS Overseas Colleges programme in more than 15 cities around the world.

Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and complex issues relevant to Asia and the world. Researchers in our faculties, research centres of excellence, corporate labs and more than 30 university-level research institutes focus on themes that include energy; environmental and urban sustainability; treatment and prevention of diseases; active ageing; advanced materials; risk management and resilience of financial systems; Asian studies; and Smart Nation capabilities such as artificial intelligence, data science, operations research and cybersecurity.

For more information on NUS, please visit nus.edu.sg.

Annexe 1: NUS Common Curriculum for Healthcare Professional Education

In line with the emphasis on patient-centric and relationship-based healthcare in Singapore, NUS undergraduate students studying Dentistry, Medicine, Nursing and Pharmacy will be able to gain deeper and broader knowledge and understanding of healthcare issues and challenges through a new cross-disciplinary common curriculum.

The new Common Curriculum for Healthcare Professional Education will apply social and behavioural determinants of health to social prescribing and planetary health; use data and digital literacy to enable population healthcare planning, delivery and evaluation; and strengthen interdisciplinary engagement as well as experiential learning.

The Common Curriculum comprises five pillars:

1. Social and Behavioural Determinants of Health (Year 1)

This pillar examines the influence of social and environmental factors on important health outcomes in the life course and across vulnerable groups, as well as how these factors affect lifestyle, preventive, and curative behaviours.

2. Professional Practice 1: The Foundations of Health Professionalism (Year 1)

Students will learn what makes a patient-centric healthcare professional through professional identity formation and communication skills. They will also gain an understanding of the legal and ethical principles underpinning the practice and delivery of health services.

3. Data Literacy for Healthcare (Year 1)

This pillar features components of evidence-based practice, and covers the principles of data analysis as well as decision-making under uncertainty which are relevant to clinical practice.

4. Professional Practice 2: Basic Skills in Health Professionalism (Year 2)

Students will delve deeper into the ethical challenges that commonly arise in clinical practice, health systems, and research, to acquire practical skills in ethical reasoning as well as working and communicating well in multidisciplinary teams.

5. Digital Literacy for Healthcare (Year 2)

This pillar explores skills such as computational thinking, data science, artificial intelligence, and machine learning in the healthcare context, and more.

Annexe 2: Minor in Biomedical Informatics

The Minor in Biomedical Informatics, required of all medical students, combines healthcare, data science, artificial intelligence and information technology to provide students with the necessary knowledge and skills to excel in the evolving field of healthcare informatics.

The Minor consists of five courses, two of which — *Digital Literacy in Healthcare* and *Data Literacy in Healthcare* — are embedded within the NUS Common Curriculum for Healthcare Professional Education.

1. Digital Literacy in Healthcare (fulfilled as part of the NUS Common Curriculum for Healthcare Professional Education)

Students will acquire skills such as computational thinking, data science, artificial intelligence and machine learning in the healthcare context, and more.

2. Data Literacy in Healthcare (fulfilled as part of the NUS Common Curriculum for Healthcare Professional Education)

This course features components of evidence-based practice, and covers the principles of data analysis, and decision-making under uncertainty, relevant to clinical practice.

3. Value-based Healthcare

This course highlights the framework for improving patient outcomes, safety, and satisfaction, with the strong support of structural data management and analytics.

4. Clinical Data System Design Testing and Governance

This course highlights effective use of data derived from medical records systems, devices and its impact on healthcare.

5. Introduction to Medical Data and Data Processing

This course highlights how data standards, sources (traditional and contemporary), and applications in healthcare allow interoperability and information flows across different IT systems.

The comprehensive curriculum ensures that students gain proficiency in using data effectively, enhancing patient outcomes through data management and analytics while fostering seamless information flow across healthcare IT systems. By empowering medical students with these essential skills, the Minor in Biomedical Informatics positions them to lead the way in shaping the future of healthcare delivery.

Annexe 3: Minor in Integrative Health

The new Minor in Integrative Health reflects the importance of disciplines other than medical sciences in the workings of modern health systems. Like all other sectors, health systems require fields such as engineering, business, legal and social sciences to complement and enable the work of healthcare professionals.

Open to first, second and third-year NUS undergraduates from non-healthcare disciplines, this Minor aims to educate and inspire these students to lead, implement and coordinate health-promoting research and development efforts using an interdisciplinary approach. Students will also cultivate an interdisciplinary mindset to solve complex health issues, and enhance individual and population health.

Students will complete five courses over two years or more. These five courses are:

1. What Impacts Health?

This course highlights various World Health Organization (WHO) health dimensions and elaborates on the Healthier SG initiative in Singapore.

2. Improving Health: Beyond Medicine

Students will learn about key local-regional conditions and the medical sciences behind them.

3. Barriers to Health

This course examines the barriers to health among demographic groups of interest in Singapore.

4. The Landscape of Health: Evolving Spaces and Technology

Students will explore the future of health through system- and user-centric design to fulfil healthcare needs.

5. Integrative Health Capstone

In collaboration with industry and community partners, students will apply their knowledge from the other four courses to work on capstone projects to solve real-world problems.

In this Minor, students will gain a better understanding of the strengths and limitations of their own disciplines in relation to other disciplines, and at the same time build networks beyond their own disciplines. They will also learn to be adept and flexible across diverse fields to safeguard health. In turn, they will develop interdisciplinary competencies for an employment advantage.