

BIOMEDICAL INFORMATICS

MASTER OF SCIENCE (MSC)

Elevate Your Career in Healthcare and Be Future-Ready



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Welcome to the Department of Biomedical Informatics.

Biomedical Informatics is set to change the way healthcare is transacted in the future. NUHS hopes to develop capabilities in academia and research in this field to be a leader in Singapore and the region.

The increased availability of Electronic Health Records (EHR) and the popularisation of machine learning methods in recent years catalysed a technological revolution in healthcare using Big Data and advanced analytics. Concurrently, technological advancements in Natural Language Processing (NLP), deep neural networks and speech recognition applied to healthcare have spurred innumerable innovations in new services such as telehealth and virtual care services.

The department is well positioned to undertake this transformation due to its natural advantages of being an academic medical centre attracting top research-inclined clinicians, collaborating with NUS academia that are the best in Asia, access to vast computing resources and world class facilities for clinical trials.

We endeavour to support and build an international network of biomedical informaticians and thought leadership in their education and research journeys and bring about higher quality of care through personalised medicine in healthcare.

Professor Ngiam Kee Yuan

Head, AI Office, NUHS
Head & Senior Consultant, Division of General Surgery (Endocrine & Thyroid Surgery), Department of Surgery, NUH
Professor, Department of Surgery, NUS Medicine
Senior Consultant, Division of Surgical Oncology, NCIS



“Traditionally, healthcare has been very fragmented, where many different groups serve specific clinical needs without necessarily coordinating with each other. But going forward, the trend is towards integration – not just of things like databases and systems, but integration of the way we process the data and how this influences the clinical workflow”

- Professor Ngiam Kee Yuan





Transformative Education. Multidisciplinary Research.

National University of Singapore (NUS) is one of the world's leading universities, with over 40,000 students across three campuses.

By offering a distinctively Asian yet global experience, NUS is recognised for its breadth of academic programmes, experiential learning, entrepreneurship education and impactful research.

As we continue from strength to strength, we take pride in nurturing our students and equipping them with the necessary skills to be the leaders of tomorrow.

Established in 1905 to educate and train medical professionals in Singapore, the NUS Yong Loo Lin School of Medicine (NUS Medicine) is a leading medical educational and research institution in Asia.

Created to help prepare healthcare workers to succeed in an increasingly technological field, the Master of Science in Biomedical Informatics (MSc in BMI) is a postgraduate degree offering specialisations in **Analytics or Hospital Management**.



NUS
National University
of Singapore

OVERVIEW

THRIVE IN THE TECHNOLOGICAL REVOLUTION

Be equipped with training in data visualisation, machine learning, and more in today's increasingly technological healthcare landscape.

GAIN EXPERIENCE WITH BIG DATA

Get access to real-time, desensitised healthcare data from actual institutional healthcare settings and utilise big data for validation in real clinical settings.

BE PREPARED FOR THE FUTURE OF HEALTHCARE

Keep your career opportunities open as more companies in the healthcare space increase their hiring rate.

GAIN EXPOSURE TO PRESTIGIOUS COMPANIES

Intern, participate in projects, and collaborate with international companies.

RISE OF TECHNOLOGY IN HEALTHCARE: WHY BMI?

- Digitalisation of healthcare through electronic health records
- Adoption of new technologies such as cloud computing, holomedicine and robotics
- Advancements in Machine Learning, Artificial Intelligence and Large Language Models

Using HoloLens 2, a form of mixed reality (MR) technology to assist with surgeries





THRIVE IN THE TECHNOLOGICAL REVOLUTION

**ACADEMIC MEDICAL CENTRE ATTRACTING
TOP RESEARCHERS & CLINICIANS**

**PROXIMITY TO NUS COMPUTING &
NUS ENGINEERING FACILITIES**

ACCESS TO VAST COMPUTING RESOURCES

WORLD CLASS FACILITIES FOR RESEARCH

Elevating the Healthcare Sector through Digital Transformation

The coursework of the MSc in BMI introduces a significant pool of skilled workers into the healthcare sector.



CORE SKILLS

The MSc in BMI aims to impart to students a suite of core skills including:

Evidence-based clinical decision making
Machine learning
Data visualisation
Effective communication
Strategic leadership
Entrepreneurship

Analytics Specialisation

Students will be trained to reason, critically analyse and subsequently evaluate the effectiveness of clinical decision support systems, as well as to lead and implement strategic clinical innovations or projects.

Hospital Management Specialisation

Aimed at training students in various aspects of hospital work, such as the implementation of public health policies, evidence-based patient care and clinical decision support systems.

FACULTY

Renowned faculty members from NUS School of Computing (SOC), NUS Saw Swee Hock School of Public Health (SSHSPH) and the NUS Institute of Systems Science (ISS), who are subject matter experts in their respective domains, will teach the curriculum. Research fellows and associates in the Department of Biomedical Informatics will also support the delivery of curriculum content with their background in biomedical informatics research.





WHO IS THE COURSE FOR?

Junior Clinicians

The programme will cover advanced modules of the American Medical Informatics Association (AMIA) curriculum, as well as offer relevant exposure to the Information Technology (IT) industry through joint courses and workshops.

Non-Clinicians

This course is also applicable to non-clinicians with industry expertise and skills, for instance, computer scientists. It will introduce them to the healthcare informatics field through upskilling and contributing to the Singapore Government's vision of a Smart Nation.

COURSE FEATURES

Highly intensive collaborative curriculum

with faculty from School of Computing,
School of Public Health and Institute of
Systems Science

Skilled resources and real-time desensitised
healthcare data from trained clinicians in
NUS Medicine

**Hands-on internships with prestigious
companies** enable students to work on
potential clinical applications with the goal
of improving patient care

**Big Data sourced from actual healthcare
institutional settings** (including primary care and
community hospitals) provide students with real-
world exposure that no other university in
Singapore can offer

CAREER PATHWAYS

MSc in BMI graduates can explore career pathways in the healthcare and biomedical industries, including but not limited to:

Leadership

Chief Medical Informatics Officer
Chief Innovation Officer
Data Scientist
Chief Strategy Officer
Chief Data Officer
Chief Technology Officer

Data Science

Biomedical Data Engineer
Health Tech Innovator
AI and Machine Learning Specialists
Big Data Specialist
Information Security Analyst
Digital Transformation Lead
Digital Transformation Specialists
Internet of Things Specialist
Fintech Engineers (Health Finance)
DevOps Engineer
Database and Network Professionals
Specialist Medical Practitioners

COURSES | CORE UNITS

BMI5101 | Advanced Biomedical Informatics

BMI5111 | Capstone Project

BMI5207 | Medical Data and Data Processing

BMI5306 | Advanced Agile Project Management

IT5001 | Software Development Fundamentals



COURSES | ANALYTICS

BMI5102 | Health Sciences for Non-Clinicians

**Not for Clinicians*

BMI5109 | Advanced Scientific Research Methods

BMI5110 | Molecular Informatics

BMI5206 | Advanced Human Factors Engineering

DL5102 | Digital Agility and Change Leadership

IT5003 | Data Structures and Algorithms

IT5005 | Artificial Intelligence

IT5006 | Fundamentals of Data Analytics

MDG5241 | Advanced Statistical Methods for Bioinformatics

SPH5409 | Qualitative Methods in Public Health

SPH6004 | Advanced Statistical Learning



COURSES | ANALYTICS / HOSPITAL MANAGEMENT

BMI5102 | Health Sciences for Non-Clinicians
**Not for Clinicians*

DL5102 | Digital Agility and Change Leadership

IT5005 | Artificial Intelligence

IT5006 | Fundamentals of Data Analytics

SPH6004 | Advanced Statistical Learning



COURSES | HOSPITAL MANAGEMENT

BMI5102 | Health Sciences for Non-Clinicians

**Not for Clinicians*

BMI5106 | Clinical Decision Support Systems

BMI5107 | Advanced Evidence Based Patient Care

BMI5108 | Advanced Value Based Healthcare

BMI5201 | Advanced Clinical Data Systems

DL5102 | Digital Agility and Change Leadership

DL5201 | Strategic Thinking and Digital Foresight

DL5302 | Managing Digitalisation Complexity

IT5005 | Artificial Intelligence

IT5006 | Fundamentals of Data Analytics

MDG5248 | Ethics of Health Data and Artificial Intelligence

SPH5007 | Implementing Public Health Programmes and Policies

SPH5003 | Health Behaviour and Communication

SPH5401 | Health Economics and Financing

SPH5412 | Economic Methods in Health Technology Assessment

SPH5416 | Introduction to Integrated Care

SPH6004 | Advanced Statistical Learning

ADMISSION REQUIREMENTS

- Fresh graduates with M.B,B.S degree, Bachelor's (Hons) degree in Quantitative Sciences (e.g Mathematics, Applied Mathematics, Statistics and Physics) or Engineering or Computer Science or Business or Health Sciences related Discipline
- Candidates with other qualifications and experience may be considered on a case-by-case basis
- Admission is on a competitive basis and candidates with relevant industry experience will be considered favourably
- International applicants are to submit TOEFL or IELTS test scores as evidence to demonstrate their language ability and readiness for graduate study. Candidates may be required to sit for other tests as prescribed by the School.
- The minimum TOEFL scores for Internet Based Test (IBT) is 85; or IELTS score of 6.0.
- The TOEFL/IELTS scores are valid for two (2) years from the test date and should not have expired at the point of application; expired scores will not be considered for the application.

PROGRAMME STRUCTURE & CANDIDATURE

The programme is offered on a full-time or part-time basis with the option to specialise in either Analytics of Hospital Management. The programme has one intake per academic year, with candidates joining in August.

To graduate from the programme, students are required to read and pass five core courses and five elective courses.



**APPLY NOW
FOR A
BETTER
FUTURE.**

APPLICATION

TUITION FEE

\$60,653

(inclusive of prevailing GST)

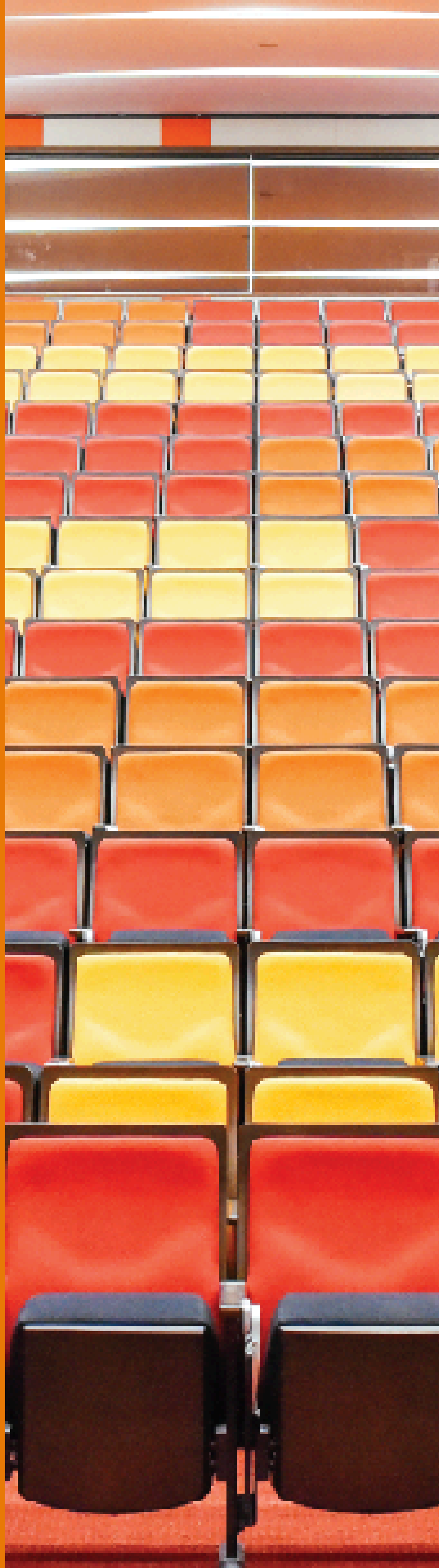
APPLICATION PERIOD

1 October 2024 to

31 January 2025

(Local and International)

Apply now at
medicine.nus.edu.sg/dbmi



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