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NTU’s new School of Physical and Mathematical Sciences – interdisciplinary education in science and mathematics

The new School of Physical and Mathematical Sciences (SPMS) of the Nanyang Technological University (NTU) aims to provide a broader education in the sciences as, increasingly, many challenging scientific questions cut across disciplines, for example in cancer and global climate change research.

When established in 2005, the new SPMS, previously referred to as School of Physical Sciences, will offer a four-year direct honours programme with students graduating with a Bachelor of Science (Honours) (B.Sc.(Hons)) degree. SPMS will also offer graduate coursework and research leading to the Master of Science (MSc) and Doctor of Philosophy (PhD) degrees.

Students will not only be knowledgeable in their respective disciplines of chemistry, physics, or mathematics, but will also have a broader understanding and appreciation across various disciplines at NTU where science and mathematics have an influence. These include Biological Sciences, Engineering, Social Sciences, and Business, as well as education programmes at NTU’s National Institute of Education.

NTU’s SPMS aims to provide a quality of undergraduate education similar to that of top universities/colleges such as Caltech, Massachusetts Institute of Technology, Johns Hopkins, etc.
For example, the major in Chemistry will follow the rigorous American Chemical Society accredited Chemistry programmes. The major in Physics will cover the six core theories with a good balance of experiments that demonstrate how science advances technology, and the major in Mathematics will include a good mix of fundamental, as well as the applied, computational and industrial aspects of mathematics and statistics. The Physical Sciences major will take an appropriate cross section of such courses depending on the challenging questions the student is attracted to.

Students will be offered opportunities for industrial and R&D attachments at local and overseas universities, companies and research institutes to keep their pulse on the industry’s needs and trends. There are also plans to offer outstanding students the opportunity to take up an accelerated B.Sc.(Hons) cum MSc degree, and a B.Sc.(Hons) cum PhD degree. However, a good education is not all about acceleration. Talented students can choose to immerse in research as early as in the first year of study, and along the way to prepare for dissertation work as partial fulfillment of the MSc or PhD degree.

SPMS will have an intake of 150 undergraduates and 30 Masters & doctoral students in the first year. By 2010, NTU projects the intake to expand to 600 undergraduates and 100 postgraduates annually.

The newly appointed Dean-designate of SPMS is Professor Lee Soo Ying. Professor Lee succeeds Professor Alex Law who is the Interim Dean of SPMS and concurrently Vice-Dean (Research) at NTU’s School of Biological Sciences. Professor Lee is known to many and he will bring to the new school more than 20 years of academic and management experience. Professor Lee is widely published in renowned journals, has authored chapters of books and is frequently invited to speak at international conferences. His research interest areas are Raman spectroscopy, nonlinear spectroscopy, and chemical reaction dynamics.

Professor Lee is confident that given the commitment to innovative and effective education of science and mathematics as practised by scientists and mathematicians, “Our graduates will be equipped with the necessary science and technological skills, and coupled with their exposure to a full array of disciplines at NTU during their studies, they will be able to address the next generation technologies and skilled manpower needs of Singapore in the global economy.” He added, “They will be a versatile group: some may take up jobs in diverse sectors of the economy or engage in R&D work, others may venture into and become leaders in the business world with acumen and entrepreneurship; while some may excel in areas that are beyond our imagination today.”

Dr Su Guaning, President of NTU, is excited about the bright prospects of SPMS, “The direction of the new school demonstrates NTU’s commitment in providing our students with a broad-based education. SPMS will complement our other degree courses as fundamental science and mathematics concepts are applied widely across all disciplines. It is also noteworthy that the official establishment of SPMS in 2005 coincides with the centenary of Einstein’s landmark discovery in 1905 of revolutionary physical science concepts of light quanta, the special theory of relativity, or more commonly known among the public as E=mc\(^2\), and statistical mechanics of Brownian motion.”
It is also opportune that Professor Lee’s first task as Dean-designate is to chair a public lecture: “So… what really happens at Absolute Zero?” by a Nobel Laureate in Physics, Dr Douglas D. Osheroff, at NTU on 12 Oct 2004. While it is commonly believed that all motion ceases at absolute zero temperature – an idea consistent with our everyday experience and classical physics – that is far from the truth. Professor Osheroff, the J.G. Jackson and C.J. Wood Professor of Physics at Stanford University, will demonstrate, using simple ideas in modern (quantum) physics, why various types of motion must exist at absolute zero. It will be a fascinating journey into a different world of nature. Aside from NTU staff and students, the lecture will be attended by students from various secondary schools and junior colleges, as well as members of the science and research community.

About Nanyang Technological University
The Nanyang Technological University (NTU) is a top-tier university, ranked among the best science and technological universities in Asia. It has a business school that is consistently ranked among the top ten in Asia.

Established in 1991, the university has since been positioning itself to be a global university of excellence and is committed to its mission of Educating Leaders and Advancing Knowledge for Singapore and Beyond. NTU has an undergraduate and graduate enrolment of about 25,000 and an international faculty of over 1,500. It offers a broad-based curriculum, which focuses on the development of global views, entrepreneurship and adaptability, through the following schools:

1. College of Engineering, which consists of five schools:
   - Civil and Environmental Engineering
   - Computer Engineering
   - Electrical and Electronic Engineering
   - Materials Engineering
   - Mechanical and Production Engineering

2. Nanyang Business School

3. School of Biological Sciences

4. School of Communication and Information

5. School of Humanities and Social Sciences

6. School of Art, Design and Media (to be established by 2005)

7. School of Physical and Mathematical Sciences (to be established by 2005)

For more information, visit http://www.ntu.edu.sg

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