The College comprises the Departments of Chemistry, Mathematics and Physics providing quality education programmes with an emphasis on interdisciplinary studies. The College has a strong international reputation in research. The excellence in research can be highlighted by the State Key Laboratory of Marine Pollution, the Center of Super-Diamond and Advanced Films, and the Liu Bie Ju Centre for Mathematical Sciences. In addition, the College has five academicians.
This major provides students with a firm foundation in chemical sciences with a focus in analytical chemistry, environmental chemistry, inorganic chemistry, organic chemistry, and physical chemistry. Students are also offered a wide range of elective courses such as biochemistry, computational chemistry, food chemistry, industrial chemistry, green chemistry, materials chemistry, and medicinal chemistry. The major puts strong emphasis on discovery-enriched curriculum, outside-classroom activities, and independent learning. Thus, students have the opportunity to undertake a directed study, project, local and non-local internship and exchange program. The major is designed to train and produce graduates who are able to pursue a developing career in local and regional industrial, commercial, government, education, and research sectors.

**MSc Chemistry**

*Duration: 1 year (Full-time) or 2 years (Combined mode)*

To train and produce graduates with highly marketable research skills and experiences in a wide variety of advanced chemistry disciplines, such as catalysis, photochemistry, synthetic chemistry, materials & biomaterials chemistry, analytical & bio-analytical science, computational chemistry, environmental chemistry and chemical biology, to meet local, regional and global demands for R&D specialists in the industrial, commercial, and government sectors. Graduates are also eligible for pursuing higher research degrees in local and overseas universities and research institutes.

**Research Degree**

The Department is very unique in a multidisciplinary nature by integrating Chemistry, Biology, and Environmental Science. Research focus and expertise include:

1. **Chemistry**: green and synthetic chemistry, green materials/manufacturing, sustainable development, spectroscopy and catalysis, catalyst design and synthesis, organic electroluminescent devices, inorganic photo-responsive and luminescent chemosensors, organometallic chemistry, homogeneous catalysis, biological chemistry, materials chemistry, computational chemistry, environmental chemistry.
2. **Biology**: chemical biology, developmental and cell biology, nanobiotechnology and biosensing, microbiology and bioactive compounds, genomics and biotechnology, proteomics and metabolomics, environmental biology.
3. **Environmental Science**: freshwater and marine pollution, aquatic ecology and conservation, sustainable development in marine ecosystem, renewable energy, energy storage and management, energy efficiency and conservation, environmental physiology, ecotoxicology, environmental biotechnology, environmental physics, environmental monitoring, environmental measurement, remediation technologies, environmental impact and risk assessment.
Department of
MATHEMATICS

+852 3442 8646
mago@cityu.edu.hk
www.cityu.edu.hk/ma

BSc Computing Mathematics
JUPAS Catalogue No.: JS1206
(for use by applicants with HKDSE examination results)

The Department of Mathematics offers the Bachelor of Science in Computing Mathematics, which aims at equipping students and producing graduates with a strong background in data analysis, mathematical modelling, scientific computing and technical computer software. Graduates will make contributions to finance and industry in the growing technology fields in Hong Kong such as biotechnology, data analysis, environmental science, information technology and intelligent business. The title of “Computing Mathematics” has been chosen as the major will focus on applied areas of mathematics linked to computing and computation.

MSc Financial Mathematics and Statistics
Duration: 1 year (Full-time) or 2 years (Combined mode)

The programme emphasizes the development of students' ability to evaluate and develop financial business and statistical opportunities. It also provides students with the theoretical knowledge necessary for complex financial and insurance operations. Furthermore, the programme enhances their mathematical and computational skills in Financial Mathematics and Risk Management. Graduates should be able to price various modern financial and insurance products and to assess and manage financial and insurance risks. The programme will significantly enhance the competitiveness of its graduates in the job market. It is expected that students majoring in Financial Engineering, Actuarial Science, Mathematics, Statistics, Physics, Engineering, Computing and Information Technology, etc. as well as professionals from both finance and insurance industries will benefit from this master degree programme.

Research Degree

BSc Applied Physics
JUPAS Catalogue No.: JS1208
(for use by applicants with HKDSE examination results)

The Applied Physics major is not an ordinary Physics major. In Applied Physics, students are taught biomedical physics, renewable energy and quantum physics, paving their way to a diversified career path including medicine and health care, education, engineering, commercial and industrial sectors, nuclear radiation facilities or postgraduate study.

Students may take part in the department-based research attachment scheme, which provides them an early exposure to discovery and innovation. Students of the Applied Physics major who meet certain requirements can apply for admission to the Joint Bachelor’s Degree Program between City University of Hong Kong and Columbia University in USA. Students admitted to the Joint Degree Program spend their third and fourth years at Columbia University in USA, and earn a BSc degree from CityU and a BA degree from Columbia University at the end of their study.

MSc Applied Physics (to be launched in 2020/21)
Duration: 1 year (Full-time) or 2 years (Combined mode)

This programme provides post graduate level training in applied physics with highly marketable professional skills in the sub-fields of bio-medical physics and energy materials physics. In addition to an advanced physics education, the graduates will gain knowledge of physical principles and how these principles can be applied to practical problems in specific related professions. The training and knowledge provided are suitable for employment as medical technical specialists and engineers in electronic and renewable energy industries in Hong Kong, China and other South Eastern countries. Graduates of this programme will have the flexibility to seek employment in the industry as well as pursuing Ph.D. studies in a broad range of related fields (e.g. Physics, Materials Science, Electrical Engineering, and Mechanical Engineering).

Research Degree

Research focus and expertise in the Department include: (1) Theoretical and Computational Physics: condensed matter theory, computational solid state physics, computational chemistry, computational biology physics, quantum computation and information, quantum simulation with cold atoms; (2) Spectroscopy and Imaging: sophisticated experiments involving quantum beams such as synchrotron x-ray, neutron, electron, coherent light, and NMR, the structure and phase transition in glass and liquids, Boson peak and the dynamics of glass and liquids, quantum interactions such as spin-orbital coupling in multiferroics; (3) Atomic, Molecular, and Optical Physics: mechanism of noise and decoherence, open quantum system and quantum entanglement, and non-equilibrium physics in AMO system; (4) Low-dimensional Systems: topological quantum computing and Majorana fermions, Dirac and Weyl semimetals, topological and dynamical phenomena and Bose-Einstein condensation and spin-orbit coupling, quantum Hall Effect, transport phenomena, superconductivity, frustrated magnetism, topological superconductors, 2D materials, heterostructures and interfaces; (5) Soft Matter and Biophysics: dynamics of protein and subcellular processes, emergent phenomena in live cells, non-equilibrium mechanisms in active living matter, biological networks, biological and clinical experiments, novel physics-based data acquisition protocol, instrumentation in biomedical imaging, radiation biophysics, ion-track technology.
CityU and Columbia University Joint Bachelor’s Degree Program

Students enrolled in a 4-year degree programme of an eligible major with outstanding academic performance may apply for the Joint Bachelor’s Degree Program. Students will spend two years at CityU and two years at Columbia University. On completion of the curriculum requirements, students will earn two bachelor’s degrees — one from CityU, and the other one from Columbia University.

To learn more about the Joint Bachelor’s Degree Program, please visit gs.columbia.edu/cityu-hk.

A Brand New College Experience

The Joint Bachelor’s Degree Program between City University of Hong Kong and Columbia University offers students an international undergraduate educational experience—a program spanning two continents, in cosmopolitan cities that allow students to engage directly with the world around them. The program draws upon elements both traditional and innovative, combining the academic rigor of two world-renowned universities with an attention to the roles that social and cultural traditions play in a student’s intellectual formation.

4-year degree students in eligible majors with outstanding academic performance may apply for the Joint Bachelor’s Degree program.
Global Outreach & Experiential Learning for Undergraduates

Student Exchange

More than 70 partner institutions at Departmental, College or Institutional level are offering global exchange places for our students, from Asia to Australia and Pacific region, Europe and North America.

Internship Scheme

By taking part in the Overseas Internship Scheme (OIS) or the Industrial Attachment Scheme (IAS), students can gain valuable practical work experience, build professional networks, and prepare for their future career.

Grand Challenges Scholars Program (GCSP)

The GCSP is a combined curricular and extra-curricular program, endorsed by the National Academy of Engineering (NAE) in February 2009, to prepare students to be the future engineers and scientists capable of solving the 14 Grand Challenges facing the world in this century. The learning components include participation in research projects, entrepreneurship schemes, interdisciplinary courses, service learning activities and overseas exchange programme.