**Chemistry**

Chemistry is the science that deals with and investigates the composition, properties, and transformation of substances and various elementary forms of matter. The undergraduate degree in chemistry at BUCT is designed to prepare students for professional careers as chemists, either upon graduation or after graduate study in chemistry or related fields. It may serve as a basis for a wide range of career choices outside of chemistry, including but not limited to: materials science, medicine and other life related occupations. Our chemistry curriculum provides broad and comprehensive training in all areas of modern chemistry, including coursework in the major sub-disciplines of chemistry: organic, inorganic, physical, structural, and analytical. Two optional majors, chemistry and applied chemistry, are set for students to choice at the 5th semester.

**Majors in Mathematical sciences**

Mathematics, has the features that beyond any concrete science and universal relevance. It studies the real world from the purely perspective of quantitative relationship and spatial form, rather than the specific moving morphology and attributes of matters, and plays an importance role as a public foundation.

In nowadays era of high-tech and big data, all fields of research in natural and social sciences have entered a deeper and wider scope. In these researches, the application of mathematics is usually substantial. The Natural Science Foundation of America has already pointed out that: contemporary research of natural sciences is showing a growing involvement of mathematics. In other words, mathematics plays a very important role behind all the high-techs. In related fields of economics and finance, mathematical methods and models are often used to study the problems in economics, financial investment strategy and risk analysis. Therefore, the special status of mathematics is showing growing importance. In the meantime, mathematical applications in other fields such as the literature and art, as well as the language culture are also flourishing.

In the US occupation ranking of recent years, mathematicians, website managers, actuaries, computer system analysts and software engineers rank the top 10 among the 250 occupations. All these top jobs require strong mathematics backgrounds in common. It is reported that, mathematical professionals which will have social needs in futures include: a) professional mathematics researchers, b) researchers of interdisciplinary subjects of mathematics and applied sciences, c) university teachers, d) practical talents in all fields of national economy who use mathematics and computers as their main research tools, e.g. actuaries, financial analysts, software designers, data analysts, experts in engineering calculation and network security, etc.; e) mathematical teachers for fundamental education.

The core curriculums compulsory for all mathematical majors are namely, the mathematical analysis (calculus), advanced algebra, differential equations, numerical analysis, probability theory, mathematical statistics, C language programming, operational research, mathematical models, etc. The courses of calculus, linear algebra and mathematical models in our department are selected as Beijing Excellent Courses. Good study of these courses in the first and second years helps to lay a solid foundation for the practice and study of future courses. Master these courses can not only help to improve our knowledge, but also has great importance in promoting the abilities of logic reasoning, mathematical modeling for solving practical problems, and the computing ability in algorithmic design. All these excellent courses help to lay good foundations for the future professional developments of students.

Our mathematics department sets up three majors. Except for the core curriculums mentioned above, each major has its particular orientations:

The major of applied mathematics offers optional courses such as chemistry, chemical engineering and automatic control theory. The training program of this major puts more focus on the ability and knowledge of chemical and chemical engineering in these selective curriculums.

The major of financial mathematics requires the optional courses of microeconomics, macroeconomics, finance, financial economics, financial risk management, insurance actuaries, option futures and other relevant courses of derivative securities. This major pays more focus on economics and finance, as well as relevant practice in financial data analysis and modeling.

The major of information and computing sciences requires the study of information theory, information security theory, database theory, data structure, digital signal processing, etc. It puts more focuses on the study and practice of computer technology, information security and related knowledge.

In our department, students of senior grades can study senior level courses such as real variable functions, functional analysis, abstract algebra, differential geometry, fuzzy mathematics, computational geometry, computational fluid dynamics, etc. Except for these regular curriculums, foreign experts are also invited by our department to offer short-term courses to students in order to broaden their views. Freshmen and sophomores in our department not only have relevant training in modelling and programming, but also have practical curriculums of mathematical software.

Students in their third year are required to participate in problem-solving mathematical modelling practices in the training bases. Students in financial mathematics will have short-intern opportunities in financial institutions such as banks and securities companies, the aim of this practice is to enrich the social practice ability for these students. Students in information and computing sciences have the opportunity to get their internships in high-tech companies relating to computers and internet.

Other curriculums for improving the study and the comprehensive quality and ability for students are varied in their forms and types. They include e.g. the courses of general physics, general education courses, military training, social practice, innovation and entrepreneurship curriculum, literature review and scientific paper writing, graduation design, as well as the university students' science and technology innovation plan, etc.

**Electronic Science and Technology major**

Electronic science and Technology major is a foundation and frontier discipline which should be strongly developed in the information era. Its main research fields are physical electronics, microelectronics and solid electronics, electromagnetic field and microwave technology as well as circuits and systems. They are widely used in information, energy, materials, aerospace, life, environment, military and civilian fields. Especially with the development of smart phones, robots, artificial intelligence and the internet of physical distribution, the demand for Electronic Science and technology personnel is increasing. At present, the market has a great demand for Electronic Science and technology professionals, especially workers who have been trained in innovative electronic science and technology design and development are urgently needed. The major of Electronic Science and technology in Beijing University of Chemical Technology, relying on the National Engineering Physics Teaching Base, the Physics Experiment Teaching Demonstration Center of Beijing University of Higher Learning, the laboratory of characteristic specialty and the practice and training base outside school, pays attention to cultivating students' solid science foundation and strong engineering practice ability.

The major of Electronic Science and Technology in our university trains the basic theory, professional knowledge and experimental ability in the fields of physical electronics, optoelectronics and microelectronics, and can be engaged in the design, manufacture and correspondence of various electronic materials and components, optoelectronic materials and devices, optical communication and information optics, optoelectronic systems and so on. Advanced engineering and management personnel with all-round development of new products, new technology, new technics, research and development.

In the course design, attention is paid to the basic teaching of foreign language, mathematics, theoretical physics, information electronic technology and computer technology, based on the principle of "thick foundation, wide caliber, and more practice" talent cultivation. Basic courses and professional courses include: Mathematical and Physical Methods, Circuit Principles, Digital Electronics, Analog Electronics, Signals and Systems, Microcomputer Principles and Interface Technologies, Physical Optics, Electromagnetic Field and Electromagnetic Waves, Solid State Physics, Laser Principles, Quantum Mechanics, Semiconductor Physics, Solid State Electronics and Optics and Electronics Physics of electronic and semiconductor devices, optoelectronic technology, microwave technology, embedded system design, weak signal detection, ultrasonic detection technology, electronic materials, photoelectric image processing, optical fiber communication and optoelectronic detection technology.

Professional practice includes: metalworking practice, cognitive practice, electrical and electronic practice, electronic technology curriculum design, social practice, production practice, application software practice, integrated curriculum design, electrical innovation practice and graduation design.

This major pays attention to the cultivation of overall quality and innovative spirit, has a stable internship base inside and outside the school and rich practical teaching links, which provides a strong guarantee for students to integrate theory with practice, cultivate practical ability and innovative ability. This specialty is a characteristic specialty in Beijing. In 2013, it was awarded the special contribution team award of our school's employment. Currently, the major has signed a "3 + 2" student coaching agreement with the University of Loughborough and Leicester University. Through two years of study in the UK, qualified students can receive an undergraduate degree from Beijing University of Chemical Technology and a master's degree from Loughborough University or Leicester University.

The ways to improve the course learning and comprehensive quality include: general education courses, military training, social practice, innovation and entrepreneurship education, application software practice, integrated curriculum design, innovation and practice of electrical engineering, graduation design and other courses, as well as subject interest groups, physics associations, mathematical modeling, electronic information competitions. Extracurricular activities such as competition, university students' science and technology innovation plan and so on.