



## 2010 Undergraduate Programs Guide

**Architecture** is a strongly comprehensive subject involving areas such as science, engineering, humanities and art. This subject features a combination of science and art as well as scientific engineering and humanities, thus demanding students to have an expansive knowledge and a strong ability of imagery. (Individuals with color blindness are not accepted into this major)

Main courses include Mathematics, Fundamentals of Computer , Introduction of Building Technology, Architecture Design Studio, Principles of Urban Planning , Preliminary of Designing, Expression of Space Form, Pencil Sketch, Water Color Painting, Architecture Design Sketch, Water Color Rendering, Engineering Technology, Engineering Mechanics, Structural Mechanics, Building Structure, History of Chinese Architecture, History of Western Architecture, History of Contemporary Architecture, Building Economics, Building Physics, Surveying and Drawing of Ancient Buildings, Design Practice and so on.

**Building Environmental and Equipment Engineering** is a comprehensive field of study involving the national economy and the people's livelihood, specializing in solving energy problems for civil, medical, transportation, and aerospace use. This field helps create a salubrious and comfortable environment with just the adequate amount of humidity, light and sound while at the same time widely reducing the required architectural energy and resource consumption.

Main courses include Mathematics, Physics, General Chemistry, Fundamentals of Computer, Introduction of Modern Biology, Building Environment, Heat Transfer, Engineering Mechanics, Fluid Mechanics, Engineering Thermodynamics, Fundamentals of Machine Design, Measurement for Indoor Climate, Introduction to Architecture, Technology for Air-Conditioning & Refrigeration, Heating Engineering, Building Automation System, Building Ventilating Engineering, Fundamentals Applications of Heat and Mass Transfer, Air Cleaning Technology, Water Supply and Drainage for Building, Building Electricity, and Engineering Economics etc.

**Civil Engineering** This major educates students to develop skills which are needed in the planning, designing, research and development, construction, and management of civil engineering so that they can fully engage in the department of design, research, construction, education, or management for buildings, underground structures, bridges, roads, etc.

Main courses include Mathematics, Physics, Fundamentals of Engineering Graphics, Fundamentals of Computer, Engineering Mechanics, Building Materials, Architecture Design and Construction, Soil Mechanics, Hydraulics, Structural Mechanics, Engineering Economics, Technology Building Operation, Planning of Building Operation, Reinforced Concrete Structure, Construction Project Management, Steel Structure, High-rise Building and Anti-seismic Structure, Bridge Engineering, and Underground Structure etc.

**Project Management** This major helps build a solid foundation for natural and industrial sciences, helps create extensive knowledge in liberal arts, helps develop a firm grasp in management, while gaining practical experience in engineering and enhancing research abilities. Job opportunities include being a property project valuer, consultant, project manager, constructor, engineer, planning manager, etc. In order for students to broaden their knowledge and conform to the needs of society, the Department of Construction Management and the Department of Civil Engineering have united to enroll students together. Students will spend their freshman year with Civil Engineering students studying fundamental courses and will return to Project Management in their sophomore year.

Main courses include Mathematics, Physics, Fundamentals of Engineering Graphics, Fundamentals of Computer, Engineering Mechanics, Structural Mechanics, Building Materials, Construction Economics, Engineering Economics, Technology Building Operation, Planning of Building Operation, Building Service Equipments ,

Construction Project Management, Construction Enterprise Management, Construction Projects Appraisal, Real Estate Investment & Finance, Real Estate Appraisal, Estate Management, Risk Management and Safety Management, Introduction to Construction Management, etc.

**Hydraulic and Hydropower Engineering** This major educates students to develop the necessary knowledge and ability needed in water conservancy, water resources, water ecosystem, water environment, water disasters, water management, and water economics etc. Upon graduating, students will be doing scientific research, planning and designing, construction and management in fields such as dam structure, the utilization of underground space, city water conservancy, city water affairs, coastal and port engineering, the informationization of hydro engineering, etc.

Main courses include Mathematics, Physics, General Chemistry, Fundamentals of Computer, Elasticity, Engineering Mechanics, Hydraulics, Soil Mechanics, Reinforced Concrete, Hydraulics Structure, Construction Technology, Urban Water Environment, The Earth and Human Being's Environment, Engineering Economics, Offshore Structures, and Steel Structure etc.

**Mechanical Engineering and Automation** Informationization and modernization are the solid foundation that implements a country's manufacturing industry. In order to adjust to demanding new technologies, the Department of Mechanical Engineering will primarily be focused on material processing and advanced fabrication techniques. Students are trained in the fields of mechanical engineering, automation and material processing to undertake scientific research, technological development, production operation and management to become the scientific talents needed in society.

Main courses include Mathematics, Physics, General Chemistry, Fundamentals of Computer Hardware Technology, Fundamentals of Computer Software Techniques, Mechanical Principle and Mechanical Design, Fundamentals of Manufacturing Engineering, Fundamentals of Control Engineering, Measurement and Test Technology, Basis of Materials Engineering, Theoretical Mechanics, Strength of Materials, Fluid Mechanics, Thermodynamics, Heat Transfer, Fundamentals of Materials Processing, Micro-Computer Control for Mechanical System, Fundamentals of Laser Materials Processing, Robot Engineering and Technology Applications, Modern Manufacturing System Engineering, Systems Engineering, Special Working Technology, and MIS of Manufacturing Process etc.

**Automatic Manufacturing and Control Technology** The Department of Precision Instruments and Mechanics have made mechanics, light, electricity and computation as the principal part of this new interdisciplinary major in order to adapt to the scientific technological needs of today. We enroll students under "Automatic Manufacturing and Control Technology" to expand the students knowledge in many professional fields. The first two years are composed of mathematics, physics, computer courses and other fundamental courses. The third year will be divided into three majors: Mechanical Engineering and Automation, Measurement Control Technology and Instruments and Micro-Electro-Mechanical System Engineering.

**Mechanical Engineering and Automation** is one of the majors students can select to further study according to personal interests after fundamental courses have been completed. Students are educated in mechanical design, manufacturing, automation basics, mechanical knowledge and its application thus being able to undertake mechanical engineering, technology development, research and application, and operation management. This major emphasizes on engineering mechanics, the foundation of mechanical design, thermal engineering, electrical engineering, electronic technology, computer courses, modern cybernetics, the craftsmanship and equipment of material processing, and detection technology etc.

**Measurement Control Technology and Instruments** is a typical major composed of mechanics, light, electricity, and computation, helping students to develop the ability to undertake the scientific research, design and development of engineering such that they can design and produce, operate and manufacture, manage scientific development and technical economics in the fields of mechanics and precision instruments, optical engineering, precision engineering and control technology. Courses of study include the manufacturing and engineering of

precision instruments, the applications of electronic technologies, computer and control technologies, testing and processing signal technologies, optical engineering, laser applications, optical electronics technology and other courses as well as practice in such areas.

**Micro-Electro-Mechanical Systems Engineering** is a new interdisciplinary field composed of many scientific technologies which has mechanics, electronics and especially micromechanics as its foundation, a new interdisciplinary subject composed of many scientific fields. Students are taught to undertake work in the design and manufacturing, production operations, technology development and management in scientific development and technical economics. In this major, aside from being taught such fundamental courses like mechanical design and measurement and control, students will also be taught courses concerning micro-nano technologies and micro-electro-mechanical systems such as micro-electro-mechanical material engineering, the design of micro systems, micro-electro-mechanical devices and systems, micro-nano measurement and testing technologies, micro processing technologies, modern sensing technologies, precision engineering, etc.

**Energy, Power Systems and Automation** This major educates students to be highly skilled talent that can efficiently deal with the research of motive power, technology development, project designing, and management. Students will also be researching and studying the fundamental theory of power and energy, thermal science and technology, application technology, and various advanced power processes and equipment.

Main courses include Mathematics, Physics, General Chemistry, Fundamentals of Computer, Electrical Engineering and Applied Electronics, Automatic Control, Thermodynamics, Heat Transfer, Fluid Mechanics, Theoretical Mechanics, Theory of Combustion, Thermal Power System, and New Energy etc.

**Vehicle Engineering** This major focuses on the cultivation of innovative thinking and the ability to put what is taught into practice, thus being able to undertake the design, technological development and management of the automotive industry as well as its relevant industries. (Individuals with red, green or yellow color blindness or allergic to petrol are not accepted into this major)

After enrolment, students who have selected “Automobile Structure and Body Design” will need to take exams in automobile designing. This direction of study will have fewer courses relevant to engineering and technology, but will instead have courses related to industrial designing such as perspective and structure sketch, fundamentals of comprehensive modeling, plane design and expression, three dimensional design and expression, ergonomics and the fundamentals of color design. The objective is to educate an artistic engineer who has a foundation in engineering.

Main courses include Mathematics, Physics, Fundamentals of Computer, Graphing of Engineering, Elements of Vibration Analysis, Mechanics & Machinery, Engineering Thermodynamics, Strength of Materials, Automobile Construction, Theory of Automobile, Design of Automobile, Automotive Engine, Vehicle Disassemble and Assemble, and Understanding Automotive Electronics etc.

**Industrial Engineering** This major concerns the science of the efficient operation of complex systems, binding both the technology of engineering and the science of management where from a system’s angle can quantitatively analyze, optimize and design the actual engineering and management problems faced today in the enterprises or organizations of the manufacturing industry, service industry, etc. Industrial engineering is a subject where the objective is system efficiency and beneficial result, making it an independent science of engineering. This major has two directions of development: Industrial Engineering and Logistics Management. During the course of the student’s education, one of the two can be selected for primary study according to his/her personal interests.

Main courses include Mathematics, Physics, Fundamentals of Computer, Introduction to Industrial Engineering, Operations Research, Statistics Application, Ergonomics, Facilities Planning and Material Flow Analysis, Production Planning and Control, Quality Engineering, Systems Engineering, Manufacturing system, Management Information System, and Engineering Economics etc.

**Electronic Information Sciences** consists of three majors: Electronic Information Engineering, Electronic Science and Technology, and Microelectronics. In order to cultivate students to form a sturdy foundation and a broad professional perspective, while instilling the ability of independently learning, we have enrolled students under “Electronic Information Sciences”. The first two years, students will be studying department-wide fundamental courses such as Mathematics, Physics, Data organization, Signals and Systems, the Circuit theory, Computers and Networking, Electromagnetic Fields and Waves, Solid State Physics and Semiconductor Physics, Fundamentals of Electronic Technology, Communication Circuits, etc. During the third year, students will be split into one of the three majors, according to their own interests. (Individuals with color blindness are not accepted into this major)

**Electronic Information Engineering** Circuits and Systems, Signals and Signal Processing, Electromagnetic Fields and Waves, Computer and Software Technologies, etc are the foundations of Electronic Information Engineering, where research on various information like voice functions, characters, graphics, radars, the process and exchange of remote sensing information, and the transmission of wireless electric and optical cable is done. With this type of foundation, research and development in various electronic and information systems is made possible. The main areas of research are: the theoretical foundation and technology of processing, transmitting, exchanging, monitoring and recognition of various information, the communication system of satellites and wireless optical fiber, and network technologies; the theory of circuits, the design and application of electronic system, the theory of design automation and technologies of system stimulations and integrated circuits; microwave theory and technology, the application technology of electromagnetic waves, the theory and technology of the electromagnetic compatibility of antennas; the application technology of circuits, the application technology of computers, and the theory and application of information processing.

**Electronic Science and Technology** As modern Physics and Mathematics as its foundation, the field of Electronic Science and Technology researches the mutual interactions of electrons and photons in different mediums; researches the technology that uses computers and signal processing; invents and develops various electronic information materials and devices, information photo-electronic materials and devices, and integrated circuits and integrated electron system. The direction of research is “Physical Electronics” and “Photo-electronic”. The main contents of concern are integrated optoelectronics, nanophotonics, optical fiber communication systems, the technology of the intellectualization of optical networks, photo-electronic devices and its application, new displays and photo-electronic membranous materials and devices, information nanomaterials and devices, high power and high speed electronic devices, micro technologies, the measurement and monitoring technologies of photo-electronic information materials, photo-electronic sensing technologies, etc.

**Microelectronics** is part of the nanoelectronics field, having two directions of research and development: Micro-nano electronics and integrated circuits and systems. This subject cultivates students to systematically master the basic theory, professional knowledge and basic skills in the technology of designing and producing integrated circuits, emphasizing on studying solid state physics, electrodynamics, semiconductor physics, microelectronics processing technology, the analysis and design of digital and integrated circuits, micro and electronic experiments, classes in the design of integrated circuits, very large scale integrated circuits CAD, MEMS and Microsystems, introduction to quantum information, introduction to nanoelectronics, and introduction to microelectronics.

**Computer Science and Technology** This major educates students to develop a comprehensive, firm and systematic understanding of both fundamental and basic professional theories while holding modern knowledge of the profession. These students will become talented computer science technicians, creative but also strongly competent in practice.

Main courses include Mathematics, Physics, Fundamentals of Programming, Principles of Circuits, Computer Organization, Digital Logical and Digital Circuits, Computer Architecture, Computer Network, Operating Systems, Principles and techniques of Compilers, Formal Language and Automation, Discrete Mathematics, Data Structure, Introduction of Artificial Intelligence, System Analysis and Control, Assemble Language Programming, Software Engineering, etc.

**Automation** has cybernetics, systematology, and information theory as its theoretical foundation, fusing together cybernetics, signal processing, and computer technology, thus is a field containing various comprehensive technologies. This major educates students to excel in the analysis, design, development and application of systems of automatic control technologies, automatic information control and other automation fields.

Main courses include Mathematics, Physics, Principles of Circuits, Introduction to Complex Analysis, Discrete Mathematics, Fundamentals of Power Electronics, Data Structure, Computer Organization, Fundamentals of Computer Software, Automatic Control Theory, Operations Research, Message Processing, Signals and System Analysis, Introduction to Data Communications and Networking, Computer Application, Artificial Intelligence, Pattern Recognition, System Identification, etc.

**Computer Software** The Department of Software has made great efforts in searching for an educational mode for the talented exceeding in software to strengthen the link of case studies and practice while also valuing the importance of the cultivation of engineering and internationalization. Students will have gained the ability of mastering computer languages, networks and database management, as well as the ability of designing and analyzing software architecture, data modeling and such aspects.

Main courses include Mathematics, Physics, Fundamentals of Programming, Java Program Design, Discrete Mathematics, Data Structure & Algorithms, Operating System, Principle and techniques of Compilers, Computer Network, Database Principles, Computer Architecture, Embedded System and Application, Database System and Application, Formal Language and Automation, Software Engineering, Artificial Intelligence, Computer Graphics, Software System Design, Software Project Management, Structure Sketching, Digital Image Processing, and Multimedia Technology etc.

**Environmental Engineering** is a comprehensive interdisciplinary field, a frontier science that has a purpose to research, protect and improve the theory of environmental quality, technology principle and engineering measures. In order for students to conform to the needs of society and broaden their professional perspectives, this department has enrolled students under “Environmental Engineering”, implementing the credit system. This field will later be divided into two majors of study of which the student can select according to personal interests: Environmental Engineering or Water Supply and Sewer System Engineering.

**Environmental Engineering** specializes in training students who engage in the control and management of liquid, gas, or solid waste and pollutants in cities, districts, drainage areas and industrial enterprises.

**Water Supply and Sewer System Engineering** focuses on educating students such that they can competently undertake the scientific work of planning, designing and managing urban water supply and drainage.

Main courses include Mathematics, Physics, Fundamentals of Computer, Surveying, Inorganic Chemistry, Analytical Chemistry, Organic Chemistry, Physical Chemistry, Environmental Engineering Monitoring, Engineering Mechanics, Fluid Mechanics, Introduction to Civil Engineering, Engineering Structure, Water Supply and Sewer System Engineering, Principles of Environmental Engineering, Water and Wastewater Treatment Engineering, Air Pollution Control Engineering, Design of Solid Waste Treatment and Disposal Facility, and Environmental Management etc.

**Electrical Engineering and Automation** This field of study cultivates students to be proficient in technologies related with the production, transmission, application, measurement and management of electrical energy. Main fields of specialization in Electrical Engineering and Automation are: electric power systems and automation, high voltage techniques and information processing, motor control, circuit systems and electromagnetic engineering, electronics, electronic monitoring and diagnosis, etc.

Main courses include Mathematics, Physics, Principle of Circuits, Complex Analysis, Electrical Machinery, Fundamentals of Analog Electronics, Fundamentals of Digital Electronics, Power Electronics, Signals and Systems, Principles of Control System, Operations Research, Computer Principle & Application, Electromagnetic Measurements, Electromagnetic Fields, Principle of Optimization, Analysis of Power Systems, Electric Drive and Control, and High Voltage Engineering etc.

**Chemical Engineering and Industrial Biological Engineering** is a field of scientific engineering that studies the transformation, shape, state, and composition of matter in the chemical industry and its related industries. The core of Chemical Engineering is to achieve the conversion of matter through chemical or biological reactions and to either purify or process a product through chemical reactions. This major will cultivate students to be competent in the Petrochemical Industry, in environmental protection and traditional Petrochemical Industries fields such as in energy and food. Also being taught is bioengineering, biochemistry engineering, biomedical engineering and such newly developing industries. (Individuals with color blindness are not accepted into this major)

Main courses include Mathematics, Physics, Fundamentals of Computer, Inorganic Chemistry, Organic Chemistry, Analytical Chemistry, Instrumental Analysis, Physical Chemistry, Biochemistry, Molecular Biology, Principles of Chemical Engineering, Thermodynamics of Chemical Engineering, Chemical Reaction Engineering, Design of Chemical Engineering, Analogue and Optimization of Chemical Engineering, Transport Processes in Chemical Engineering, Principles of Genetic Engineering, Cell Culture Engineering, and Industrial Microbiology etc.

**Polymer Materials and Engineering** This major educates students that have the typical trait of both science and engineering. Students can undertake the research of new polymer materials, material preparation, the development of processing technology, and management of production technology. (Individuals with even weak color blindness are not accepted into this major)

Main courses include Mathematics, Physics, Fundamentals of Computer, Inorganic Chemistry, Organic Chemistry, Analytical Chemistry, Instrumental Analysis, Physical Chemistry, Biochemistry, Chemical Engineering, Polymer Chemistry, Polymer Physics, Advanced Organic Chemistry, Structural Chemistry, Overviews of Material Science, Fundamentals of Material Science, Principles of Polymerization Engineering, and Polymer Processing and Application etc.

**Materials Science and Engineering** Materials are the material base of the social progress. Materials, energy and informatics have been considered as the three pillars of modern civilization. This major here at Tsinghua has developed a unique advantage in the direction of research in areas such as functional materials and devices, biomedical materials, non-equilibrium materials, nanomaterials and devices, energy and environmental materials, high performance ceramic materials, advanced metallic materials, high performance macromolecular and composite materials, computational materials science, and in the theory of material processing. Students will be able to grasp vast yet systematic basic knowledge of Materials Science. (Individuals with color blindness are not accepted into this major)

Main courses included Mathematics, Physics, Fundamentals of Computer, Engineering Mechanics, Quantum and Statistical, Solid State Physics, Fundamentals of Materials Science, Mechanics Properties and Statistics of Ceramics, Physical Properties of Materials, Fundamentals of Mechanics Properties of Materials, Experiments on Chemistry Property of Materials, Advanced Composite materials, and Electron Microscope Analysis etc.

**Biomedical Engineering** is a developing interdisciplinary field composed of science, engineering, medicine and biology which is mainly concerned with the prevention of sickness and disease in people as well as the treatment, recovery and health of people. This field not only applies but also helps to provide an advanced level of scientific and engineering theories and methods to better explore the phenomena and rules of life. Among the vast variety of research opportunities offered, the main areas of research include biomedical processing, medical imaging, biomedical materials, human organs, recovery projects, long-distance treatment and biochips.

Main courses include Mathematics, Physics, Introduction of Modern Biology, Introduction to Biomedical Engineering, Physiology, Fundamentals of Digital Electronics, Fundamentals of Analog Electronics, Programming on Advanced Computer Languages, Principles and Applications of Microcomputers, Computer Graphics, Signal and System, Digital Signal Processing, Automatic Control Theory, Medical electronic equipment, Detecting and processing of information of Kinesiology, Biomedical Electronics, Medical Instruments Design, Image Processing, etc.

**Experimental Class of Biomedical and Biopharmaceutical Sciences:** Based on a credit system with flexible study duration and sectional teaching, this program offers training on scientific thinking to students. Freshmen and sophomores will be learning fundamental courses such as Math, Physics, Chemistry, Biology and Computer Science etc. Juniors can choose a specific direction of study in either Clinical Medicine or Pharmacology and Pharmaceutical Sciences according to their area of interest from their second semester. The total study duration of this program is 8 years: normally a Bachelor of Science in Pharmacology can be obtained in 4 years and a Doctor of Medicine in Clinical Medicine can be obtained in 8 years.

**Pharmacology and Pharmaceutical Sciences** Main courses include General biology and laboratory practice, Biochemistry and laboratory practice, Molecular biology and laboratory practice, Cell biology and laboratory practice, Microbiology and laboratory practice, Genetics and laboratory practice, Laboratory practice of pharmaceutical sciences, Organic chemistry, Pharmaceutical chemistry, Pharmaceutical analytic chemistry, Pharmacology, Pharmaceutics, Spectroscopy identification, Toxicology, Pharmacokinetics, Molecular drug design, Physiology and experiment, Introduction of pathology and pathophysiology, Immunity etc.

**Clinical Medicine** Main courses include Anatomy, Histology, Embryology, Physiology, Pathology, Pathophysiology, Pharmacology, Hygiene, Epidemiology, Social medicine, Diagnostics, Surgery, Medicine, Pediatrics, Obstetrics and gynecology, Communicable diseases, Nuclear medicine, Medical imaging, Medical emergency, Otorhinolaryngology, Dermatology and sexology, Preventive medicine, Psychiatry etc.

**Fundamental Sciences (Mathematics and Physics)** In order to expand the student's knowledge, the Department of Mathematics and Physics have decided to enroll undergraduates in the major of "Fundamental Sciences". Upon being enrolled, students will be comprehensively taught, where studies in the first two years will mainly be focused on firmly learning the fundamentals of mathematics and physics. The following years will be divided into three majors: Mathematics and Applied Mathematics, Information and Computing Science and Physics.

**Mathematics and Applied Mathematics** These courses focus on the standardized training to establish a solid mathematical foundation, guides students to more profound mathematical branches, helps students to come into contact with the ideology and outline of modern mathematics, to expand the fields of knowledge, to motivate the desire to learn, to encourage the interest in exploration and to develop creativity.

Main courses include Analysis, Algebra and Number Theory, Geometry and Topology, Statistics and Probability Theory, Computational Mathematics, Operations Research and Optimization, Algebra, Geometry, Differential Equations, and Mathematics of Randomness etc.

**Information and Computing Science** is a field faced with advanced technologies, where emphasizing on sharp mathematical assessment and the thorough understanding of mathematics is necessary in order for students to develop sharp thinking skills where it is then possible to excel in Information Technology, where mathematics is its foundation, Informatics is its object and computers are its tool. In the first two years, fundamental courses of Mathematics, Computer Programming and the use of mathematic software will be taught. In the next two years, while simultaneously strengthening mathematical courses, courses in Information Science, network technology, large-scale scientific computing, the Optimization Theory and Methods, etc will be taught.

**Physics** is further divided into two directions of educational growth: Physics and the Application of Physics. In the former, students are trained to undertake research in fundamental sciences while in the latter, students are trained to apply the new achievements in the Physics field into the fields of science and technology. Aside from learning all the core courses in the Physics Department, students will be more emphasized on gaining the skills developed in courses involving Experimental Physics, Electronic Technologies, Computer Applications, etc.

Main courses include Advanced Calculus, Advanced Algebra and Geometry, Differential Equations, Functions of a Complex Variable and Equations in Mathematical Physics, General Physics, Analytical Mechanics, Electrodynamics, Quantum Mechanics, Statistical Mechanics, Solid Physics, Lab. of General Physics, Experiments in Modern Physics, Electrical Technology & Electrical Engineering, Program Designing, and Fundamentals of Computer Technology etc.

**Chemistry** is a natural science that studies the properties, composition, structure and application of matter at an

atomic and molecular level. This is the foundation of the development of modern Life Science, Material Science and Environmental Science. This major educates students to develop a strong foundation in Chemistry such that they can undertake research, development and application in Chemistry and other related fields but also to cultivate comprehensive individuals that have sufficient knowledge of interdisciplinary sciences. (Individuals with even weak color blindness are not accepted into this major)

Main courses include Mathematics, Physics, Fundamentals of Computer, Inorganic Chemistry, Analytical Chemistry, Instrumental Analysis, Organic Chemistry, Physical Chemistry, Biochemistry, Structural Chemistry, Molecular Biology, Polymer Chemistry, Elementary Chemical Engineering, Statistical Thermodynamics, Catalysis Kinetics, The Principle and Technology of Separation, and Organic Synthesis etc.

**Biological Science** This major mainly focuses on Biophysics, Structural Biology, Biochemistry, Molecular Biology, Cell Development Biology, and other relevant fields, cultivating students to undertake scientific research, biological education and the development of application. (Individuals with color blindness are not accepted into this major)

Main courses include Mathematics, Physics, Fundamentals of Computer, Organic Chemistry, Inorganic Chemistry, Analytical Chemistry, Molecular Biology, Biochemistry and Experiment, Cell Biology and Experiments, Microbiology and Experiments, Genetics and Experiments, The General Experiment of the Gene Engineering, Lab Work of Cell Biology, Genetics and Development Biology, Biophysics, Neurobiology, Immunology, and Bioinformatics etc.

**Economics and Finance** This major will systematically teach students analyzing methods, the theory of both Economics and Finance, and to develop the skill of resolving the issues in today's modernized economic world such that the individual will not only develop an international aspect on global issues but to also have an understanding of the situation in China. After graduation, employment opportunities can be found in departments of economic management, security companies, investment banks, commercial banks, insurance companies, various investment fund companies, financial organizations, financial management consulting firms and commercial enterprises.

Main courses include Calculus, Geometry and Algebra, Probability and Statistics, Applied Mathematical Statistics, Principles of Economics, Principles of Accounting, Principles of Finance, General Management, Political Economy, Intermediate Macroeconomics, Intermediate Microeconomics, Econometrics, International Economics-Theory and Policy, Developmental Economics, Money and Banking, Principles of Corporate Finance, Investment, International Commerce, International Financial Market, Finance Database, Investment Banking, etc.

**Business Administration—Accounting** Cultivating students into becoming a comprehensive and internationally top quality accountant for the high standard employment market is the objective of the Department of Accounting, while also emphasizing well rounded diverse education and the cultivation of the ability of quantitative analysis. All professional courses adapt internationally top notch textbooks and teaching materials so that students can fully comprehend the knowledge of today's accounting world and thoroughly adapt to international needs.

Main courses include Calculus, Geometry and Algebra, Probability and Statistics, Applied Mathematical Statistics, Computer Programming Language, Managerial Accounting, Accounting, Principles of Finance, General Management, Taxation, International Taxation, Accounting Theory, Accounting Information System, Large Financial Data Analysis, etc.

**Business Administration—Information Management and Information Systems** is a comprehensive class of economics, management theory, and information science. The objective of this major is to educate students so that they will master the construction of information systems, management theory and methods, undertake information management, the design and development of information systems, and the development and application of information resources to become an individual of universal talent. Such a person would be able to analyze economic systems, design, operate, and manage information systems, including electronic commerce systems.

Main courses include Calculus, Geometry and Algebra, Probability and Statistics, Applied Mathematical Statistics, Operational Research, Principles of Economics, Intermediate Microeconomics, General Management, Principles of

Finance, Principles of Corporate Finance, Business Management, Principles of Accounting, Production and Operation Management, Programming Design Language, Data Structures, Principle & Application of Database, Computer Networks, Introduction of Information Management, Management Information Systems, Expert Systems and Decision Support Systems, Optimization Models and Software Tool, Introduction to Electronic Business, System Analysis and Design, etc.

**Experimental Class of Humanities** This experimental class emphasizes on classic literature, multidisciplinary topics, and the spreading of the spirit of humanities and science. Students will be trained and educated to become a comprehensive, innovative, and international individual of talent that is capable of undertaking fundamental research in humanities, research in interdisciplinary subjects, international communication and other relevant subjects. The first two years are taught without a specific major in mind where students can learn about the general knowledge of this subject, Classic Chinese Literature, Classic Western Literature, Ancient Chinese, an Outline of Modern Chinese History, Literary History and Philosophy, etc. In their senior year, according to the student's personal interests, the student is able to select one of the following majors as a primary major of study but also being able to select classes from one of the other majors.

**Chinese Language and Literature** Main courses include A History of Ancient Chinese Prose, History of Modern Chinese Literature, Chinese Contemporary Literature, History of Chinese Language, Thought of Foreign Literature, Contemporary Chinese Language, Paleography, Linguistic Theory, Phonology, Exegetics, Comparative literature, and Literary Masterpieces and Writing Training etc.

**History** Main courses include Before Qin History, History of Late Qing Dynasty, History of Qin and Han Dynasties, The History of Wei, Jin, the Southern and the Northern Dynasties, History of Sui, Tang and the five Dynasties, History from Song to Yuan Dynasty, History of Republic of China, Modern World History, Selected Readings of History, Society and Culture of Ancient China, Topics on Modern Chinese History, Regional or National Histories, and Modern Intellectual History of China etc.

**Philosophy** Main courses include Logic Theory, Introduction to Philosophy, Principles Ethica, Principles of Aesthetics, The History of Science Technology, History of Western philosophy, Modern Western Philosophy, Modern Chinese Philosophy, Philosophy of Science and Technology, Analytic Philosophy, Greek Philosophy, Philosophy of Value, and Neo-Confucianism etc.

**Experimental Class of Social Sciences** This experimental class emphasizes on the cultivation of skills and professional research methods as well as the foundation or mathematics and foreign languages. Students are trained to have an international view on issues, a firm knowledge of humanities and social science as well as a solid method in the research of humanities and social science. The first and second year will be composed of fundamental education in Classic Chinese Literature, Classic Western Literature, Ancient Chinese, an Outline of Modern Chinese History, Literary History and Philosophy, etc. In the third year, students can select Sociology, Economics or International Relations according to their personal interests.

**Sociology** Main courses include Economic Sociology, Social and Flow, Social Survey & Research Method, Social Statistics, Development Sociology, Urban Sociology, Rural Sociology, Political Sociology, Organization Sociology, and The History of Sociological Thought etc.

**Economics** Main courses include Intermediate Macroeconomics, Intermediate Political Economy, Topics on Chinese Economy, Econometrics, History of Economic Thought, Industrial Economy, Mathematical Economics, Financial Economics, International Business Law, Public Economics, Development of Economics, Environmental Economics, Regional Economics, Law of Economy, and International Finance etc.

**International Relations** Main courses include Introduction to International Relation, The History of Contemporary International Relation, Comparative Political Systems, Introduction to National Security, Science Technology and International Security, Science Technology and International Security, Theories of International Economic Law, International Organization, Chinese Foreign Policy, International Law, Japan Studies, and American Politics & Foreign Policy etc.

**Experimental Class of Social Sciences—Psychology** The Department of Psychology at Tsinghua

University was established in 1926, and in 2008 was reestablished with world-renowned Psychologist Dr. Kaiping Peng as the department head. The Psychological Department's objective is to educate students to firmly grasp basic theories, instill fundamental knowledge through application and to cultivate students who hold an international perspective and who are also capable of applying themselves for great achievements in areas such as Politics, Economics, Management, Education, Business, etc. This department maintains long-term cooperations with the University of California, Berkeley, periodically selecting outstanding students for exchange studies in Berkeley.

Main courses include Mathematics, General Biology, Neuroanatomy, Probability and Statistics, General Psychology, Social Psychology, Experimental Psychology, Cognitive Psychology, Developmental Psychology, Psychological Testing and Measurement, Personality Psychology, Psychology of Management, Abnormal Psychology, Research Methods in Psychology, Experimental Social Psychology, Psychology of Cross-Cultural Communication, etc.

**English** This major educates students to develop a firm grasp in the knowledge of the fundamentals of English, to develop the skills of language application, to fluently master the English language, literature and its relevant fields such that after graduation, the student will be involved with translation, education, commerce and trade, management, international exchange, etc.

Main courses include Comprehensive English, English Listening, Spoken English, Interpretation, English Writing, Advanced English, A Survey of English-speaking Countries, English Newspaper Reading, the History of the English Language, English Lexicology, English Stylistics, English Literature, American Literature, and Selected Reading of English Plays etc.

**Japanese** This major educates students to develop a firm foundation in the Japanese language, a strong ability in the application of Japanese, and to have a wide knowledge of fields such as humanities, science and technology, economic trade, etc. After graduating, students can become involved in translation, education, commerce and trade, management, international cultural exchange, etc.

Main courses include Essential Japanese, Listening, Conversation, Extensive Reading, Intensive Reading, Video Course, From the Silver Screen: English Films Appreciation, Grammar, Interpretation, Japanese Society, History of Japanese Literature, and Selected Readings in Newspaper etc.

**Chinese Language and Literature** Advanced classes are split into the following two directions: Chinese and Literature. This major mainly helps students to develop the ability to communicate, read Chinese, proficiently use modern Chinese orally and literarily; develop a systematic understanding and knowledge of the Chinese language, literature, society and culture and to be involved with Sino-foreign economic and cultural exchange issues, and at the same time have a deep understanding of the Chinese language, literature and its relevant theories. After preliminary education, students will have formed a firm foundation to continue their studies and research in the Chinese language and literature. Foreigners in this major will be in a class independent from the Chinese students.

Main courses include A Brief History of China, Contemporary Chinese Language, Classic Chinese Language, An Introduction to Linguistics, Chinese Characters, Chinese Writing, Reading on the Works of Modern Chinese Literature, Reading on the Works of Chinese Contemporary Literature, Reading on the Works of Chinese Ancient Literature, A History of Modern Chinese Literature, A History of Ancient Chinese Literature, Foreign Literature, Introduction to Literature, Special Studies on Chinese Language, and Special Topics on Contemporary Chinese Literature etc.

**Law** The Department of Law has accepted the concept "Knowledge is the public implement for the world, law is one's sensible duty.", taking into reference the valuable experience and pedagogy from China and around the world with which Tsinghua's many subjects can be fully expressed with an advantage of comprehensiveness. Students will gain a firm grasp in the theoretical foundation and knowledge of law as well as having an understanding in natural

science, economic management, and other fields concerning humanities and social sciences, becoming a comprehensive scholar in the field of law.

Main courses include Introduction to Legal Science, Constitutional Law, General Principles of Civil Law, General Principles of Commercial Law, Criminal Law: General Part, International Law, Civil Procedure Law, Administrative Law & Administrative Litigation, Chinese Legal History, Introduction to Economics Law, Criminal Procedure Law, Intellectual Property Law, Jurisprudence, Private International Law, A History of Chinese Legal Thought, and History of Western Legal Theory etc.

**Journalism and Communication** The Department of Journalism and Communication's key directions of development are in media theories and practice, international broadcasting, film-television dissemination, new media journalism and network media management. This major educates students to become highly skilled in the journalism and communication field through both theory and practice. After graduation, students can undertake positions of management, planning, editing and production in press and publications, television broadcasting, internet disseminator, advertising of public relations, etc.

Main courses include Principle of Journalism Studies, The History of Chinese Journalism and Communications, History of Foreign Journalism, Theory of Communications, Editorial Writing, Newspaper Editing, Radio and Television News, Introduction to New Media, Film & TV Art, Business Administration of Media Firms, Media Law, Media Criticism, and News Photography etc.

## **Subjects of Academy of Arts and Design, Tsinghua University**

**Artistic Design** There are 16 directions of study in this major: Design (Textile Design), Design(Fashion Design), Design (Ceramic Design), Design (Visual Communication Design), Design (Interior Design), Design (Landscape Design), Industrial Design (Product Design), Industrial Design (Exhibition Design), Industrial Design (Vehicle Design), Design (Information Design), Design (Animation), Design (Photography), Design (Metal Art), Design (Lacquer Art), Design (Glass Art), and Design (Fiber Art).

**Design (Textile Design)** Main courses include Design of Interior Fabric, Design of Vehicle Fabric, CAD Application of Printing and Dyeing, Artistic Design of Weaving, Fundamentals of Textile Design etc.

**Design (Fashion Design)** Main courses include CAD Application of Apparel, Graphic Clipping, Solid Clipping, Fashion Color by Design(Raiment Color), Fashion Design, Dress Ornament Design etc.

**Design (Ceramic Design)** Main courses include Ceramic Design, Fundamentals of Ceramic Decoration , Foundation of Ceramic Material & Technology, History of Foreign Pottery and Porcelain, History of Chinese Pottery and Porcelain etc.

**Design (Visual Communication Design)** Main courses include Chinese Tradition Decorate Art, Script Design, Visual Expression, Space Composition, Logo Design, Packing Design, Book Design etc.

**Design (Interior Design)** Main courses include Space Composition, Furniture Design, Introduction to Interior Design Style, Interior Design, Display Design , Architecture Design.

**Design (Landscape Design)** Main courses include Architecture Morphology, History and Theory of Architecture and Garden, Environmental Psychology, Landscape Design, Design of Horticulture in Landscape Architecture, Landscape Reconnaissance & Cartography, Layout of Urban Space etc.

**Industrial Design (Product Design)** Main courses include Industrial Design in General, Management of Display Engineering, Application of Multimedia Technology, Display Scheme and Design etc.

**Industrial Design (Exhibition Design)** Main courses include Display Design in General, Management of Display Engineering, Application of Multimedia Technology, Display Scheme and Design etc.

**Industrial Design (Vehicle Design)** Main courses include Design of Vehicle Forms in General, Vehicle Design, Computer Assistant Design of Automobile Forms etc.

**Design (Information Design)** Main courses include Information Art in General, User Interface Design, Interaction Design, Digital Dynamic Design Representation, Interactive Media Design, Digital Video & Audio Design etc.

**Design (Animation)** Main courses include Earlier Stage Creativity of Animation, Originality Animation Skill, Artistic Expression of Animation and Cartoon, Animation Art in General, The Behavioral Regulations of Animation, Digital Dynamic Design Representation, Artistic Design of Animation etc.

**Design (Photography)** Main courses include Photography Aesthetic, Photography technology, Digital Media Foundation, Scientific Photography, Advertisement Photography, Digital Image Production, Fashion Photography etc.

**Design (Metal Art)** Main courses include Introduction to Metal Art, Clay Figure, Flesh Sculpture, Relief, Welding Craft, Casting Craft, Jewelry Art etc.

**Design (Lacquer Art)** Main courses include Lacquer Materials, Line Drawing, Chinese Painting, Lacquer Painting Art, Lacquer Art, Lacquer Materials etc.

**Design (Glass Art)** Main courses include Relief, Flesh Sculpture, Public Art, Pattern Design, Composition, Black and White Painting, Fundamentals of Decoration, Three Dimensional Modeling, Comprehensive Material, Glass Kilning, Glass Blowing, Glass Decoration, Craftwork of Glass Art etc.

**Design (Fiber Art)** Main courses include Relief, Flesh Sculpture, Public Art, Pattern Design, Composition, Black and White Painting, Fundamentals of Decoration, Three Dimensional Modeling, Comprehensive Material, Fiber Art, Fiber Technique, Comprehensive Material, Tapestry Creation etc.

**Plastic Arts** There are 5 directions of study in this major: Painting (Chinese Painting), Painting (Oil Painting), Painting (Printmaking), Painting (Fresco and Public Art), and Sculpture.

**Painting (Chinese Painting)** Main courses include Strong Coloring, Free style (Figure, Flowers and Birds), Sketching, Line Drawing, Chinese Painting etc.

**Painting (Oil Painting)** Main courses include Sketching, Copy and Appreciation of Occidental Oil Painting, Oil Painting From Life etc.

**Painting (Printmaking)** Main courses include Water Color Wood Block Printing, Copperplate Print, Silk Screen, Print Language Training, Black and White Wood Block etc.

**Painting (Fresco and Public Art)** Main courses include Figure Painting in Deep and Bright Colors, Comprehensive Materials, Art History-fresco, Tempera, Fresco Creation etc.

**Sculpture** Main courses include Nude Sketch, Figure in Relief, History of Sculpture, Nude Clay Figure, Life Size of Nude Clay Figure, Concrete Sculpture, Abstract Sculpture, Sculpture in General etc.

## **History of Art**

**Theory of Arts and Design** Main courses include Subjects of the History of Chinese Arts and Crafts - Dynastic History, Subjects of the Art History, Methodology of Art History, Subject of History of Artistic Design, Special Topics on National and Folk Art etc.