# Undergraduate Programme for Computer Science

**(Programme Code: 080901H）**

## I. Length of Schooling

(1) Standard Length of Schooling: 4 years;

(2) Flexible period of schooling: 3-6 years.

## II. Degrees

The students, having obtained the credits as required for the cultivation scheme and complied with the requirements as stipulated by Regulations Concerning the Management of the Student Status and School Roll of Undergraduate of Beijing Jiaotong University, are entitled to obtain the undergraduate diploma of Computer Science and Technology. Both the bachelor degree of engineering of Beijing Jiaotong University and the bachelor degree of science of Lancaster University will be conferred to students who comply with the provisions, subject to the examinations and approval of the respective University Academic Degree Committees.

(1) Bachelor of Engineering in Computer Science and Technology from Beijing Jiaotong University;

(2) and Bachelor of Science from Lancaster University.

## III. Specialty Orientation

Computer Science and Technology is a specialty in the wide range that combines computer science and information technology. The specialty relies on computer science and technology which is listed as a first-level discipline, emphasizing the intersection and integration of computer science and information technology, which constructs a solid theoretical foundation and professional knowledge system for undergraduates; It strengthens the ability of students on computer system analysis and to solve practical issues related to complex engineering, accentuating the cultivate of innovation and personal practical skills, which also provides students a brief understanding of its application on transportation; Senior specialized personnel will be trained to solve and analyze issues on computer system analysis and design, technical research and development, computer engineering design and technical applications related to complex engineering. At the same time, this specialty is enhancing its professional advantages gradually to step to the domestic advanced ranks and to increase international awareness.

## IV. Program Aims

The objectives of Computer Science and Technology are to cultivate students’ all around development of moral, intellectual, physical and aesthetics, enhance their knowledge, ability and quality, and to lay a solid foundation for their professional development and career development by good quality education and professional training. For the comprehensive qualities, students will have high ethical cultural enrichment and scientific research quality, good communication, expression and writing skills, strong sense of social responsibility and lifelong learning ability. Besides, students will have a strong foreign language ability and a solid theoretical basis for mathematics and electronics. What’s more, students will master the basic theory and modern technology of computer system, technology and application. At the same time they will have strong practical ability, sense of innovation and spirit of teamwork. After graduated, students may become senior specialized personnel with a strong sustainable development potential and social adaptability who are able to work in many areas, including scientific research on the level of both computer system and application, system development, technology application, systems integration, teaching, management and so on.

For the development and demand of industries like information technology and rail transportation, engineering and technical personnel are cultivated to master the basic theory and modern technology of computer systems and computer application, who also have innovation awareness, practical ability, team spirit and a certain international vision. The detailed program objectives of this specialty are as follows:

(1) An ability to identify, analyze and solve essential technical issues related to computer science, adapt to independent and team work environments, and to be charge with the work of computer system design, development and implementation.

(2) An ability to identify, analyze and research basic science issues related to computer science, adapt to independent and team work environments, and to undertake scientific research in computer science and technology or related disciplines.

(3) A wide international vision and a certain ability of international competition and cooperation, with good professionalism and strong sense of social service, and to be a management role in a design, development or research team.

(4) An ability to develop knowledge through continuing education or other lifelong learning on the basis of professional knowledge, technical ability and comprehensive quality, adapt to works of other areas initially, and to adapt to the needs of modern science and technology and social development in the future.

## V. Graduation Requirements

There are 12 graduation requirements of Computer Science and Technology, which is represented by 29 indicators. Details are as follows:

**1. Engineering Knowledge: An ability to apply knowledge of mathematics, natural sciences, fundamentals of engineering and professional knowledge appropriate to complex engineering issues related to computer science and technology**

1.1 Students should understand and master the basic knowledge of mathematics, physics and other natural sciences courses, and to have a certain sense of modern scientific and technical methodology.

1.2 Students should understand and master the basic knowledge and methods of computer science and technology, understand the basic engineering knowledge in computer application system, understand the preliminary knowledge and engineering technology in transportation engineering field, and have certain computational thinking.

1.3 Students should be able to solve complex engineering issues in computer systems and applications with mathematics and natural sciences, fundamentals of engineering and professional knowledge in curriculum assessments, practical sessions, science and technology activities, and final year project.

**2．Problem Analysis: An ability to apply the basic principles of mathematics, natural sciences and engineering science to identify and express complex engineering issues, and to obtain effective conclusions through the literature analysis and research of computer science and technology.**

2.1 Students should be able to analyze and identify the complexity of the practical engineering application issues by applying the basic theories and methods of mathematics, natural sciences, computer science and technology, and to clearly describe and express them.

2.2 Students should be able to use a variety of literature search methods to find the required references, and to have the ability to review and analyze relevant literatures.

2.3 Students should be able to analyze, describe, reason and verify relevant complex engineering issues in the areas of curriculum assessments, practical sessions, science and technology activities, and final year project, etc. using mathematics, natural science, computer science and technology.

**3．Solution: An ability to design solutions that meet the specific needs of the system or unit (component) and solutions for complex computer engineering issues, reflect innovation awareness during design stage, and to consider the factors of social, health, safety, legal, cultural and environment.**

3.1 Students should master the basic principles and methods of computer science and technology application engineering issues, and to design reasonable solutions for complex engineering problems.

3.2 Students should be able to understand and master the solutions of computer science and technology and its application of complex engineering issues from the design methodology, and in the process of resolving a certain degree of innovative thinking should be presented.

3.3 Students should be able to establish a comprehensive consideration of social and cultural, health and safety, ethics and law, environment and development and other factors in the curriculum assessments, practical sessions, science and technology activities, and final year project.

**4．Scientific Research: An ability to study complex engineering issues based on scientific principles and scientific methods, including design experiments, analyze and interpret data, and to achieve reasonable and effective conclusions through information synthesis.**

4.1 Students should understand and master the basic theories and methods of computer science and technology, and to understand the basic research methods from the scientific and technical methodology.

4.2 Students should be able to use the relevant theories and methods to establish, analyze and compare qualitative or quantitative models for complex computer engineering issues; and to master the original data collection and processing methods, parameter analysis methods, results validation and comprehensive analysis methods.

4.3 Students should be able to research and develop solutions to complex engineering issues through a number of design experiments, simulation experiments, research workshops or projects in the curriculum assessments, practical sessions, science and technology activities, and final year project.

**5．Modern Tools: An ability to develop, select and use appropriate technologies, resources, modern engineering tools and information technology tools for complex engineering issues, including predictions and simulations of complex engineering problems and to understand their limitations.**

5.1 Students should be proficient in programming methods, environments and tools, including software development integration environments, experimental data analysis tools, emulation and simulation tools, etc.

5.2 Students should be able to master the application environment and development tools of computer systems, including database system environment and tools, operating systems and compiling systems, computer network environments and Internet platforms, computer system components simulation and evaluation, etc.

5.3 Students should be able to select and apply computer science and technology methods, environments and tools for the solutions of complex engineering issues, analyzing and comparing, predicting and simulating, and be able to understand and explain the limitations of proposed solutions.

**6．Engineering and Society: An ability to analyze rationally based on engineering-related background knowledge, evaluate the impact of professional engineering practices and complex engineering problem solutions on society, health, safety, law and culture, and to understand the responsibilities that should be borne.**

6.1 Students should understand the basic knowledge of society, safety, health, ethics, and law, and to understand their interaction with computer science and technology applications.

6.2 In the process of solving complex engineering issues, students should be able to analyze, compare and evaluate from the aspects of humanities and society, health and safety, ethics and law, and to present the obligations, integrity and responsibility.

**7．Environment and Development: An ability to understand and evaluate the impact of engineering practice on the complex engineering issues in the computer and its application systems to the environment and social sustainable development.**

7.1 Students should have the basic knowledge and awareness of environmental and sustainable development, and be able to understand the impact and importance of computer science and technology and their applications on the current social environment, the natural environment and sustainable development.

7.2 Students should understand that any engineering practice in complex engineering issues is likely to have an impact on the environment and sustainable development, and the solution to specific problems should be analyzed and evaluated in terms of environmental and sustainability impacts.

**8．Professional Norms: An ability to cultivate the humanities and social science literacy, social responsibility, and to understand and abide by the professional, ethics and norms, fulfill the responsibility in computer science and technology engineering practice.**

8.1 Students should understand the basic knowledge of humanities and social sciences related to the current social development situation, present the health psychology, the correct values, and the knowledge and literacy of humanities and social sciences in practical problem solving.

8.2 Students should be able to understand the practical problems of complex engineering issues may involve humanities and social environment, professional ethics and norms, and to comply with professional engineers professional ethics and norms, fulfill social responsibility in engineering practice.

**9．Individual and Team: An ability to understand and function effectively on the roles of individuals, team members, and leaders in a multidisciplinary team and play a corresponding role.**

9.1 Students should understand the importance of respecting individual rights and interests, understand the relationships of individuals, teams, and society, understand the unity of interests of individuals and teams, and the role of different members and leaders of the team.

9.2 Students should participate in certain cross-departmental, cross-disciplinary organizations or competitions and other scientific and technological activities, or participate in certain engineering practice, social practice, public welfare activities, research, etc., and in which to play its corresponding role.

**10．Expression and Communication: An ability to communicate and exchange effectively with industry peers and the public audiences on complex engineering issues, including writing reports, presentations and articulating views, etc., and to communicate and exchange in a cross-cultural context, with a certain international perspective.**

10.1 Students should be able to read literatures and retrieve documents using a foreign language in computer science and technology, with professional foreign language communication and writing skills, an international perspective, and be able to communicate and exchange in a cross-cultural context.

10.2 Students should be able to communicate and exchange effectively with students, peers, and the public audiences in a variety of teaching and practical sessions, including writing reports and designing manuscripts, presenting statements, articulating views, responding to questions, etc.

**11．Project Management: An ability to understand and master the computer application system analysis and design issues of engineering management principles and economic decision-making methods, and to be applied in a multi-disciplinary environment.**

11.1 Students should understand and master the general project planning and management, basic knowledge and methods of engineering decision-making and economic, and a certain understanding of the current computer science and technology related industries.

11.2 Students should be able to understand and apply the multidisciplinary knowledge of engineering management principles and economic decision-making methods to solve complex engineering issues in curriculum assessments, practical sessions, science and technology activities, and final year project.

**12．Lifelong Learning: An ability to engage in autonomous learning and lifelong learning, and to learn and adapt to the current development continuously in the process of scientific research and technology application.**

12.1 Students should be able to understand the importance of autonomous and lifelong learning, and the need to master a certain method on autonomous learning and lifelong learning.

12.2 Students should be able to present autonomous and lifelong learning in all aspects of the teaching and practice, and demonstrate a certain degree of autonomous and lifelong learning in solutions to complex engineering issues.

## VI. Core Subject Courses

There are 12 core subject courses for the major of computer science.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **Course Code** | **Course Name** | **Credits** | **Hours** | **Delivered By** |
| 1 | WB80L002Q | Advanced Programming Language (A) | 4 | 64 | BJTU |
| 2 | WB80L004Q | Discrete Mathematics (A) I | 3 | 48 | BJTU |
| 3 | WB80L207Q | Discrete Mathematics (A) II | 3 | 48 | BJTU |
| 4 | WK80L100Q WK80L200Q | Software Development | 5 | 80 | LU |
| 5 | WK80L101Q WK80L201Q | Fundamentals of Computer Science | 5 | 80 | BJTU |
| 6 | WK80L102Q WK80L202Q | Information Systems | 5 | 80 | LU |
| 7 | WK80L203Q  WK80L103Q | Digital Systems | 5 | 80 | BJTU |
| 8 | WK80L108Q | Databases | 3 | 48 | BJTU |
| 9 | WK80L109Q | Computer Networks | 3 | 48 | LU |
| 10 | WK80L106Q | Operating Systems | 3.5 | 56 | BJTU |
| 11 | WK80L111Q | Distributed Systems | 3 | 48 | LU |
| 12 | WK80L112Q | Languages and Compilation | 3 | 48 | BJTU |

## VII. The Statistical Information of the Courses

In this programme for the major of the computer science, the statistical data are shown below..

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Total Hours** | **Lancaster Uni.** | **Percentage Delivered by LU** |
| Total Contact Hours | 2600 | 1044 | 40.15% |
| Total Number of Courses | 53 | 20.5 | 38.68% |
| Total Number of Core Courses | 12 | 4 | 33.33% |
| Total Contact Hours of Core Courses | 744 | 256 | 34.41% |

Note: No including the course SCC 300: Final Year Project.

And the distribution of all the courses is shown below.

Program for

Computer Science

149.5 Credits

(minimum) in total

(139.5Compulsory Credits,

10 Optional Credits)

Basic Courses of Humanities and Social Sciences

32 Credits in total (29 Compulsory Credits, 3 Optional Credits)

Ideology & Politics (13 Compulsory Credits)

English (12 Compulsory Credits)

Military Theory & Training (3 Compulsory Credits)

Physical Education (1 Compulsory Credit, 3 Optional Credits)

Basic Courses of Natural Science Foundation

(28 Compulsory Credits in total)

Major Courses (81.5 Compulsory Credits)

Major Optional Courses (6 Optional Credits)

Specialty Courses

87.5 Credits in total

(81.5 Compulsory Credits, 6 Optional Credits)

Mathematics (18 Compulsory credits)

Physics (10 Compulsory credits)

Courses of

General And Public Foundation

60 Credits

(Compulsory 57 credits, Optional 3 Credits)

General Public Courses 2 Credits （Compulsory 1 Credit, Optional 1 Credit）

（Compulsory 1 credits）

Introduction to Transportation（Compulsory 1 Credit）

Fundamentals of Computer (Optional 1 Credit）

## VIII. Cross-References of the Courses

In this section, we list the cross-references of all the Lancaster University course names in both Chinese and English, as well as the course numbers and the credits in both Lancaster University and Beijing Jiaotong University.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LU**  **Course No.** | **BJTU**  **Course No.** | **Course Title**  **英文课程名称** | **Chinese Title**  **中文课程名称** | **LU Credits** | **BJTU**  **Credits** |
| SCC 110 | WK80L200Q | Software Development I | 软件开发技术I | 20 | 2 |
| SCC 110 | WK80L100Q | Software Development II | 软件开发技术II | 3 |
| SCC 120 | WK80L201Q | Fundamentals of Computer Science I | 计算机科学基础 I | 20 | 2 |
| SCC 120 | WK80L101Q | Fundamentals of Computer Science II | 计算机科学基础 II | 3 |
| SCC 130 | WK80L202Q | Information Systems I | 信息系统I | 20 | 2 |
| SCC 130 | WK80L102Q | Information Systems II | 信息系统II | 3 |
| SCC 150 | WK80L203Q | Digital Systems I | 数字系统原理I | 20 | 2 |
| SCC 150 | WK80L103Q | Digital Systems II | 数字系统原理II | 3 |
| SCC 201 | WK80L108Q | Databases | 数据库系统 | 15 | 3 |
| SCC 202 | WK80L104Q | Human Computer Interaction | 人机交互技术 | 15 | 3 |
| SCC 203 | WK80L109Q | Computer Network | 计算机网络 | 15 | 3 |
| SCC 204 | WK80L105Q | Software Design | 软件设计技术 | 15 | 3.5 |
| SCC 205 | WK80L110Q | Professional Issues and Research Methods | 职业素质与研究方法 | 15 | 3 |
| SCC 210 | WK80S204Q | Group Project I | 分组项目 I | 15 | 2 |
| SCC 210 | WK80S205Q | Group Project II | 分组项目 II | 2 |
| SCC 211 | WK80L106Q | Operating Systems | 操作系统 | 15 | 3.5 |
| SCC 212 | WK80L107Q | Advanced Programming | 高级程序设计方法 | 15 | 3.5 |
| SCC 300 | WK80S206Q | Final Year Project | 毕业设计项目 | 30 | 6 |
| SCC 306 | WK80L115Q | Internet Applications Engineering | 互联网应用工程 | 15 | 3 |
| SCC 311 | WK80L111Q | Distributed Systems | 分布式系统 | 15 | 3 |
| SCC 312 | WK80L112Q | Languages and Compilation | 语言与编译 | 15 | 3 |
| SCC 360 | WK80L116Q | Computer Science Seminars | 计算机科学与技术讲座 | 15 | 3 |
| SCC 361 | WK80L113Q | Artificial Intelligence | 人工智能 | 15 | 3 |
| SCC 363 | WK80L114Q | Security and Risk | 计算机安全与风险 | 15 | 3 |
| SCC 365 | WK80L117Q | Advanced Networking | 高级网络技术 | 15 | 3 |
| SCC 366 | WK80L118Q | Media Coding and Processing | 多媒体编码与处理 | 15 | 3 |
| SCC 369 | WK80L119Q | Embedded Systems | 嵌入式系统 | 15 | 3 |

## IX. Conducting Schema of the Major Courses

The programme includes all the compulsory courses and some optional courses of the computer science major in the Lancaster University. In this section, the learning time allocation is given below. In the BJTU autumn semester, the total weeks contain one week holiday in the first week in October; In the BJTU spring semester, the total weeks contain three public holidays.

| **No.** | **Course No. & Name** | **Hours** | **Weeks** | **BJTU**  **Credits** | **LU**  **Credits** | **Lecture Hours** | **Tutorial**  **Hours** | **Practical**  **Hours** | **Taught**  **by** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 01 | WB80L006Q:Fundamentals of Computer | 32 | 8 | 1 | N/A | 24 | N/A | 8 | BJTU |
| 02 | WB80L005Q: Introduction to Computer Majors | 16 | 8 | 1 | N/A | 16 | N/A | N/A | BJTU |
| 03 | WB80L002Q:Advanced Programming Language (A) | 64 | 16 | 4 | N/A | 48 | N/A | 16 | BJTU |
| 04 | WB80L004Q: Discrete Mathematics (A) I | 48 | 12 | 3 | N/A | 48 | N/A | N/A | BJTU |
| 05 | WB80L207Q: Discrete Mathematics (A) II | 48 | 12 | 3 | N/A | 48 | N/A | N/A | BJTU |
| 06 | WB80L139Q: Object-Oriented Programming | 64 | 16 | 4 | N/A | 48 | N/A | 16 | BJTU |
| 07 | WK80L200Q: Software Development I | 32 | 12 | 2 | 20 | 12 | N/A | 20 | LU |
| 08 | WK80L100Q: Software Development II | 48 | 16 | 3 | 18 | N/A | 30 | LU |
| 09 | WK80L201Q: Fundamentals of Computer Science I | 32 | 12 | 2 | 20 | 22 | 10 | N/A | BJTU |
| 10 | WK80L101Q: Fundamentals of Computer Science II | 48 | 16 | 3 | 32 | 16 | N/A | BJTU |
| 11 | WK80L202Q: Information Systems I | 32 | 12 | 2 | 20 | 12 | 10 | 10 | LU |
| 12 | WK80L102Q: Information Systems II | 48 | 16 | 3 | 18 | 20 | 10 | LU |
| 13 | WK80L203Q: Digital Systems I | 32 | 12 | 2 | 20 | 22 | 10 | N/A | BJTU |
| 14 | WK80L103Q: Digital Systems II | 48 | 16 | 3 | 32 | 16 | N/A | BJTU |
| 15 | WK80L108Q: Databases | 48 | 12 | 3 | 15 | 30 | N/A | 18 | BJTU |
| 16 | WK80L104Q: Human Computer Interaction | 48 | 12 | 3 | 15 | 28 | N/A | 20 | LU |
| 17 | WK80L109Q: Computer Networks | 48 | 12 | 3 | 15 | 38 | N/A | 10 | LU |
| 18 | WK80L105Q: Software Design | 56 | 12 | 3.5 | 15 | 34 | N/A | 22 | BJTU |
| 19 | WK80L110Q: Professional Issues and Research Methods | 48 | 12 | 3 | 15 | 24 | N/A | 24 | BJTU |
| 20 | WK80S204Q: Group Project I | 32 | 12 | 2 | 15 | 8 | N/A | 24 | BJTU  & LU |
| 21 | WK80S205Q: Group Project II | 32 | 12 | 2 | 8 | N/A | 24 | BJTU  & LU |
| 22 | WK80L106Q: Operating Systems | 56 | 12 | 3.5 | 15 | 24 | N/A | 32 | BJTU |
| 23 | WK80L107Q: Advanced Programming | 56 | 12 | 3.5 | 15 | 30 | N/A | 26 | LU |
| 24 | WK80S206Q : Final Year Project | 0 | N/A | 6 | 30 | 18 | N/A | 110 | BJTU  & LU |
| 25 | WK80L115Q: Advanced Internet Applications (Optional) | 48 | 11 | 3 | 15 | 24 | N/A | 24 | BJTU |
| 26 | WK80L111Q: Distributed Systems | 48 | 12 | 3 | 15 | 30 | N/A | 18 | LU |
| 27 | WK80L112Q: Languages and Compilation | 48 | 15 | 3 | 15 | 30 | N/A | 18 | BJTU |
| 28 | WK80L116Q: Computer Science Seminars (Optional) | 48 | N/A | 3 | 15 | 24 | N/A | 24 | BJTU  & LU |
| 29 | WK80L113Q: Artificial Intelligence | 48 | 15 | 3 | 15 | 30 | N/A | 18 | BJTU |
| 30 | WK80L114Q: Security and Risk | 48 | 12 | 3 | 15 | 24 | N/A | 24 | LU |
| 31 | WK80L117Q: Advanced Networking (Optional) | 48 | 12 | 3 | 15 | 24 | N/A | 24 | LU |
| 32 | WK80L118Q: Media Coding and Processing (Optional) | 48 | 12 | 3 | 15 | 24 | N/A | 24 | BJTU |
| 33 | WK80L119Q: Embedded Systems (Optional) | 48 | 12 | 3 | 15 | 18 | N/A | 30 | BJTU |

## X. The Process Table of All the Courses

| **No.** | **Course**  **Category** | **Course Name** | **Compulsory**  **/Optional** | **BJTU**  **Credits** | **Hours** | **Exam**  **/CWA** | **LG**  **/ N** | **Semester**  **& Weeks** | **Credits**  **Required** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A01 |  | WB61L001T: The Outline of Chinese Modern History | Compulsory | 2 | 32 | CWA | LG | 2 | 13  Credits |
| A02 | Ideology  & Politics | WB61L006T : Ideological and Moral Cultivation and Legal Basis | Compulsory | 2.5 | 48 | CWA | LG | 1 |
| A03 | WB61L008T: Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics | Compulsory | 3 | 64 | CWA | LG | 4 |
| A04 | WB61L007T: Introduction to the Basic Principles of Marxism | Compulsory | 2.5 | 48 | CWA | LG | 3 |
| A05 | WB61S002T: Social Practice of Ideological and Political Theory | Compulsory | 1 | 2Weeks | CWA | Pass/ Fail | 5 |
| A06 | WB61L005T: Situation and Policy | Compulsory | 2 | 32 | CWA | Pass/ Fai | 1-7 |
| B01 | English | WK62L001T: English and Study Skills I | Compulsory | 3 | 96 | Exam | LG | 1  1-16 | 12  Credits |
| B02 | WK62L002T: English and Study Skills II | Compulsory | 3 | 96 | Exam | LG | 2  1-16 |
| B03 | WK62L003T: English and Study Skills III | Compulsory | 3 | 96 | Exam | LG | 3  1-16 |
| B04 | WK62L004T: English and Study Skills IV | Compulsory | 3 | 96 | Exam | LG | 4  1-16 |
| C01 | Military Theory & Training | WB00L003T: Military Theory | Compulsory | 0.5 | 32 | CWA | Pass/ Fai | 1 | 3  Credits |
| C02 | WB00S001T: Military Training | Compulsory | 2.5 | 14 Days | CWA | Pass/ Fai | 1 |
| D01 | Physical  Education | WB60S001T : Physical Education I | Compulsory | 1 | 32 | CWA | LG | 1  1-16 | 4  Credits |
| D02 | WB60S002T  WB60S003T  WB60S004T  Physical Optional Courses | Optional | 3 | 32 | CWA | Pass/ Fai | 2-4  1-16 |
| E01 | Mathematics | WB73L001Q : Calculus (B) I | Compulsory | 6 | 96 | Exam | N | 1  1-16 | 18  Credits |
| E02 | WB73L003Q: Calculus (B) II | Compulsory | 5 | 80 | Exam | N | 2  1-16 |
| E03 | WB73L002Q : Geometry and Algebra (B) | Compulsory | 3.5 | 56 | Exam | N | 1  1-16 |
| E04 | WB73L004Q: Probability and Mathematical Statistics (B) | Compulsory | 3.5 | 56 | Exam | N | 3/4  1-16 |
| F01 | Physics | WB73L149Q: University Physics(A) I | Compulsory | 4 | 64 | Exam | N | 2  1-16 | 10  Credits |
| F02 | WB73L150Q : University Physics(A) II | Compulsory | 4 | 64 | Exam | N | 3  1-16 |
| F03 | WB73S194Q: Experiments in Physics I | Compulsory | 1 | 32 | CWA | LG | 2  1-16 |
| F04 | WB73S195Q: Experiments in Physics II | Compulsory | 1 | 32 | CWA | LG | 3  1-16 |
| G01 | General Public | WB80L006Q:Fundamentals of Computer | Optional | 1 | 32 | CWA | Pass/ Fai | 1  1-8 | 2  Credits |
| G02 | WB70L007T: Introduction to Transportation | Compulsory | 1 | 16 | CWA | Pass/ Fai | 1 |
| H01 | Major  Foundation  Courses | WB80L005Q: Introduction to Computer Science Major | Compulsory | 1 | 16 | CWA | Pass/ Fai | 1 & 2 | 35  Credits |
| H02 | WB80L002Q:Advanced Programming Language (A) | Compulsory | 4 | 64 | Exam | N | 1  1-16 |
| H03 | WB80L004Q: Discrete Mathematics (A) I | Compulsory | 3 | 48 | Exam | N | 1  1-12 |
| H04 | WB80L207Q : Discrete Mathematics (A) II | Compulsory | 3 | 48 | Exam | N | 2  1-12 |
| H05 | WB80L139Q: Object-Oriented Programming | Compulsory | 4 | 64 | Exam | N | 2  1-16 |
| H06 | WK80L200Q: Software Development I | Compulsory | 2 | 32 | CWA | LG | 3  1-12 |
| H07 | WK80L100Q: Software Development II | Compulsory | 3 | 48 | Exam | N | 4  1-16 |
| H08 | WK80L201Q: Fundamentals of Computer Science I | Compulsory | 2 | 32 | CWA | LG | 3  1-12 |
| H09 | WK80L101Q: Fundamentals of Computer Science II | Compulsory | 3 | 48 | Exam | N | 4  1-16 |
| H10 | WK80L202Q: Information Systems I | Compulsory | 2 | 32 | CWA | LG | 3  1-12 |
| H11 | WK80L102Q: Information Systems II | Compulsory | 3 | 48 | Exam | N | 4  1-16 |
| H12 | WK80L203Q: Digital Systems I | Compulsory | 2 | 32 | CWA | LG | 3  1-12 |
| H13 | WK80L103Q: Digital Systems II | Compulsory | 3 | 48 | Exam | N | 4  1-16 |
| I01 | Major Courses | WK80L104Q: Human Computer Interaction | Compulsory | 3 | 48 | Exam | N | 5  1-12 | 44.5  Credits |
| I02 | WK80L105Q : Software Design | Compulsory | 3.5 | 56 | Exam | N | 5  1-12 |
| I03 | WK80L106Q: Operating Systems | Compulsory | 3.5 | 56 | Exam | N | 5  1-12 |
| I04 | WK80L107Q: Advanced Programming | Compulsory | 3.5 | 56 | Exam | N | 5  1-12 |
| I05 | WK80S204Q: Group Project I | Compulsory | 2 | 32 | CWA | N | 5  7-16 |
| I06 | WK80S205Q : Group Project II | Compulsory | 2 | 32 | CWA | N | 6  1-10 |
| I07 | WK80L108Q: Databases | Compulsory | 3 | 48 | Exam | N | 6  1-12 |
| I08 | WK80L109Q : Computer Networks | Compulsory | 3 | 48 | Exam | N | 6  5-16 |
| I09 | WK80L110Q: Professional Issues and Research Methods | Compulsory | 3 | 48 | CWA | N | 6  1-10 |
| I10 | WK80L111Q : Distributed Systems | Compulsory | 3 | 48 | Exam | N | 7  1-12 |
| I11 | WK80L112Q : Languages and Compilation | Compulsory | 3 | 48 | Exam | N | 7  1-12 |
| I12 | WK80S206Q : Final Year Project | Compulsory | 6 | N/A | CWA | N | 7-8 |
| I13 | WK80L113Q : Artificial Intelligence | Compulsory | 3 | 48 | Exam | N | 8  1-12 |
| I14 | WK80L114Q: Security and Risk | Compulsory | 3 | 48 | CWA | N | 8  1-12 |
| I15 |  | WK80L207Q ：Engineering and Society | Compulsory | 2 | 32 | CWA | N |  | 2 Credits |
| K01 | Major Optional  Courses | WK80L115Q: Advanced Internet Applications | Optional | 3 | 48 | Exam | N | 7  1-12 | 6  Credits |
| K02 | WK80L116Q: Computer Science Seminars | Optional | 3 | 48 | CWA | N | 7-8  1-16 |
| K03 | WK80L117Q: Advanced Networking | Optional | 3 | 48 | Exam | N | 8  1-12 |
| K04 | WK80L118Q: Media Coding and Processing | Optional | 3 | 48 | CWA | N | 8  1-12 |
| K05 | WK80L119Q: Embedded Systems | Optional | 3 | 48 | CWA | N | 8  1-12 |

## XI. Schedule of Each Semester

This schedule aims at guiding the students to select the courses as they are required to pay more attention to the semester credits control, the well-matched package of the optional courses and the self-independent studies as planned or scheduled according to the learning interests.

The total credits of this program are 149.5, with 139.5 credits compulsory and 10 credits optional. There are 33 major courses. In the first 4 semesters, students are required to complete fundamental courses in humanities and social science, natural science and fundamental specialty courses. To graduate in the fourth year, you should acquire approximately 18 credits each semester during the period of specialty learning.

Note: In the following tables, LG stands for Letter Grade, and N stands for Numerical grade.

### Military Training (Summer Semester)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Name** | **Compulsory**  **/Optional** | **LU**  **Credits** | **BJTU**  **Credits** | **Hours** | **Exam**  **/CWA** | **LG**  **/ N** | **Teaching**  **Weeks** | **Hours**  **/Week** | **Taught**  **by** |
| WB00L003T: Military Theory | Compulsory | N/A | 0.5 | 32 | CWA | Pass/ Fai | 2 |  | BJTU |
| WB00S001T: Military Training | Compulsory | N/A | 2.5 | 14 Days | CWA | Pass/ Fai |  |  | BJTU |
| Credits Required | Credits Recommended: 3 Compulsory Credits+ 0 Optional Credits | | | | | | | | |

### Year 0: Autumn Semester

| **Course Name** | **Course code** | **Compulsory**  **/Optional** | **LU**  **Credits** | **BJTU**  **Credits** | **Hours** | **Exam**  **/CWA** | **LG**  **/ N** | **Teaching**  **Weeks** | **Hours**  **/Week** | **Taught**  **by** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| The Outline of Chinese Modern History | WB61L001T | Compulsory | N/A | 2 | 32 | CWA | LG | 1-16 | 2 | BJTU |
| Situation and Policy | WB61L005T | Compulsory | N/A |  |  |  |  |  |  | BJTU |
| Physical Education I | WB60S001T | Compulsory | N/A | 1 | 32 | CWA | LG | 1-16 | 2 | BJTU |
| English and Study Skills I | WK62L001T | Compulsory | N/A | 3 | 96 | Exam | LG | 1-16 | 6 | LU |
| Calculus (B) I | WB73L001Q | Compulsory | N/A | 6 | 96 | Exam | N | 1-16 | 6 | BJTU |
| Geometry and Algebra (B) | WB73L002Q | Compulsory | N/A | 3.5 | 56 | Exam | N | 1-16 | 3.5 | BJTU |
| Advanced Programming Language (A) | WB80L002Q | Compulsory | N/A | 4 | 64 | Exam | N | 1-16 | 4 | BJTU |
| Fundamentals of Computer | WB80L006Q | Optional | N/A | 1 | 32 | CWA | Pass/ Fai | 1-8 | 4 | BJTU |
| Discrete Mathematics (A) I | WB80L004Q | Compulsory | N/A | 3 | 48 | Exam | N | 1-12 | 4 | BJTU |
| Introduction to Computer Science Major | WB80L005Q | Compulsory | N/A |  |  |  |  |  |  | BJTU |
| Introduction to Transportation | WB70L007T | Compulsory | N/A | 1 | 16 | CWA | Pass/ Fai |  | 4 | BJTU |
| Credits Required | Credits Recommended: 23.5Compulsory Credits + 1 Optional Credit | | | | | | | | | | |

### Year 0: Spring Semester

| **Course Name** | **Course Code** | **Compulsory**  **/Optional** | **LU**  **Credits** | **BJTU**  **Credits** | **Hours** | **Exam**  **/CWA** | **LG**  **/ N** | **Teaching**  **Weeks** | **Hours**  **/Week** | **Taught**  **by** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ideological and Moral Cultivation and Legal Basis | WB61L006T | Compulsory | N/A | 2.5 | 48 | CWA | LG | 1-16 | 3 | BJTU | |
| Situation and Policy | WB61L005T | Compulsory | N/A |  |  |  |  |  |  | BJTU | |
| Physical Optional Courses | WB60S002T | Optional | N/A | 1 | 32 | CWA | Pass/ Fai | 1-16 | 2 | BJTU | |
| English and Study Skills II | WK62L002T | Compulsory | N/A | 3 | 96 | Exam | LG | 1-16 | 6 | LU | |
| Calculus (B) II | WB73L003Q | Compulsory | N/A | 5 | 80 | Exam | N | 1-16 | 5 | BJTU | |
| University Physics(A) I | WB73L149Q | Compulsory | N/A | 4 | 64 | Exam | N | 1-16 | 4 | BJTU | |
| Experiments in Physics I | WB73S194Q | Compulsory | N/A | 1 | 32 | CWA | LG | 1-16 | 2 | BJTU | |
| Discrete Mathematics (A) II | WB80L207Q | Compulsory | N/A | 3 | 48 | Exam | N | 1-12 | 4 | BJTU | |
| Object-Oriented Programming | WB80L139Q | Compulsory | N/A | 4 | 64 | Exam | N | 1-16 | 4 | BJTU | |
| Introduction to Computer Science Major | WB80L005Q | Compulsory | N/A | 1 | 16 | CWA | Pass/ Fai |  |  | BJTU | |
| Credits Required | Credits Recommended: 23.5 Compulsory Credits + 1 Optional Credits | | | | | | | | | |

### Year 1: Autumn Semester

| **Course Name** | **Course Code** | **Compulsory**  **/Optional** | **LU**  **Credits** | **BJTU**  **Credits** | **Hours** | **Exam**  **/CWA** | **LG**  **/ N** | **Teaching**  **Weeks** | **Hours**  **/Week** | **Taught**  **by** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics | WB61L008T | Compulsory | N/A | 3 | 64 | CWA | LG | 1-16 | 4 | BJTU | | |
| Situation and Policy | WB61L005T | Compulsory | N/A |  |  |  |  |  |  | BJTU |
| Physical Optional Courses | WB60S003T | Optional | N/A | 1 | 32 | CWA | Pass/ Fai | 1-16 | 2 | BJTU |
| English and Study Skills III | WK62L003T | Compulsory | N/A | 3 | 96 | Exam | LG | 1-16 | 5 | LU |
| Probability and Mathematical Statistics (B) | WB73L004Q | Compulsory | N/A | 3.5 | 56 | Exam | N | 1-16 | 3.5 | BJTU |
| University Physics(A) II | WB73L150Q | Compulsory | N/A | 4 | 64 | Exam | N | 1-16 | 4 | BJTU |
| Experiments in Physics II | WB73S195Q | Compulsory | N/A | 1 | 32 | CWA | LG | 1-16 | 2 | BJTU |
| Software Development I | WK80L200Q | Compulsory | 20 | 2 | 32 | CWA | LG | 1-12 | 3 | LU |
| Fundamentals of Computer Science I | WK80L201Q | Compulsory | 20 | 2 | 32 | CWA | LG | 1-12 | 3 | LU |
| Information Systems I | WK80L202Q | Compulsory | 20 | 2 | 32 | CWA | LG | 1-12 | 3 | LU |
| Digital Systems I | WK80L203Q | Compulsory | 20 | 2 | 32 | CWA | LG | 1-12 | 3 | LU |
| Engineering and Society | WK80L207Q | Compulsory |  |  |  | CWA | N |  |  |  |
| Credits Required | Credits Recommended: 22.5 Compulsory Credits + 1 Optional Credits | | | | | | | | | | |

Notes: The entries of LU Credits are filled in the whole credits about the courses SCC 111, SCC 120, SCC 130, and SCC 150.

### Year 1: Spring Semester

| **Course Name** | **Compulsory**  **/Optional** | **LU**  **Credits** | **BJTU**  **Credits** | **Hours** | **Exam**  **/CWA** | **LG**  **/ N** | **Teaching**  **Weeks** | **Hours**  **/Week** | **Taught**  **by** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| WB61L007T: Introduction to the Basic Principles of Marxism | Compulsory | N/A | 2.5 | 48 | CWA | LG | 1-16 | 3 | BJTU |
| WB61L005T: Situation and Policy | Compulsory | N/A |  |  |  |  |  |  | BJTU | |
| WB60S004T：Physical Optional Courses | Optional | N/A | 1 | 32 | CWA | Pass/ Fai | 1-16 | 2 | BJTU |
| WK62L004T: English and Study Skills IV | Compulsory | N/A | 3 | 96 | Exam | LG | 1-16 | 5 | LU |
| WK80L100Q: Software Development II | Compulsory | 20 | 3 | 48 | Exam | N | 1-16 | 3 | LU |
| WK80L101Q: Fundamentals of Computer Science II | Compulsory | 20 | 3 | 48 | Exam | N | 1-16 | 3 | LU |
| WK80L102Q: Information Systems II | Compulsory | 20 | 3 | 48 | Exam | N | 1-16 | 3 | LU |
| WK80L103Q: Digital Systems II | Compulsory | 20 | 3 | 48 | Exam | N | 1-16 | 3 | LU |
| WK80L207Q：Engineering and Society | Compulsory |  |  |  | CWA | N |  |  |  | |
| Credits Required | Credits Recommended: 17.5 Compulsory Credits + 1 Optional Credits | | | | | | | | | |

Notes: The entries of LU Credits are filled in the whole credits about the courses SCC 111, SCC 120, SCC 130, and SCC 150.

### Year 2: Autumn Semester

| **Course Name** | **Compulsory**  **/Optional** | **LU**  **Credits** | **BJTU**  **Credits** | **Hours** | **Exam**  **/CWA** | **LG**  **/ N** | **Teaching**  **Weeks** | **Hours**  **/Week** | **Taught**  **by** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| WB61S002T : Social Practice of Ideological and Political Theory | Compulsory | N/A | 1 | 2Weeks | CWA | Pass/ Fai |  |  | BJTU |
| WB61L005T: Situation and Policy | Compulsory | N/A |  |  |  |  |  |  | BJTU | |
| WK80L104Q: Human Computer Interaction | Compulsory | 15 | 3 | 48 | Exam | N | 5-16 | 4 | LU |
| WK80L105Q: Software Design | Compulsory | 15 | 3.5 | 56 | Exam | N | 3-16 | 4 | BJTU |
| WK80S204Q: Group Project I | Compulsory | 15 | 12 | 32 | CWA | N | 7-16 | 4 | BJTU  & LU |
| WK80L106Q: Operating Systems | Compulsory | 15 | 3.5 | 56 | Exam | N | 1-14 | 4 | BJTU |
| WK80L107Q: Advanced Programming | Compulsory | 15 | 3.5 | 56 | Exam | N | 5-16 | 4 | LU |
| WK80L207Q：Engineering and Society |  |  |  |  | CWA | N |  |  |  |
| Credits Required | Credits Recommended: 16.5 Compulsory Credits + 1 Optional Credits | | | | | | | | | |

### Year 2: Spring Semester

| **Course Name** | **Compulsory**  **/Optional** | **LU**  **Credits** | **BJTU**  **Credits** | | **Hours** | **Exam**  **/CWA** | | **LG**  **/ N** | **Teaching**  **Weeks** | | **Hours**  **/Week** | | **Taught**  **by** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| WB61L005T: Situation and Policy | Compulsory | N/A |  | |  |  | |  |  | |  | | BJTU | |
| WK80L108Q: Databases | Compulsory | 15 | 3 | | 48 | Exam | | N | 1-12 | | 4 | | BJTU |
| WK80L109Q: Computer Networks | Compulsory | 15 | 3 | | 48 | Exam | | N | 5-16 | | 4 | | LU |
| WK80L110Q: Professional Issues and Research Methods | Compulsory | 15 | 3 | | 32 | CWA | | N | 1-10 | | 4 | | BJTU |
| WK80S205Q: Group Project II | Compulsory | 15 | 12 | | 32 | CWA | | N | 1-10 | | 4 | | BJTU  & LU |
| WK80L207Q：Engineering and Society | Compulsory |  | 2 |  | | CWA | N | |  |  | | BJTU | | |
| Credits Required | Credits Recommended: 13 Compulsory Credits | | | | | | | | | | | | | |

### Year 3: Autumn Semester

| **Course Name** | **Compulsory**  **/Optional** | **LU**  **Credits** | **BJTU**  **Credits** | **Hours** | **Exam**  **/CWA** | **LG**  **/ N** | **Teaching**  **Weeks** | **Hours**  **/Week** | **Taught**  **by** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| WB61L005T: Situation and Policy | Compulsory | N/A | 2 | 32 | CWA | Pass/ Fai |  |  | BJTU |
| WK80S206Q: Final Year Project | Compulsory | 30 | 0 |  | CWA | N | 7-16 |  | BJTU  & LU |
| WK80L111Q: Distributed Systems | Compulsory | 15 | 3 | 48 | Exam | N | 1-12 | 4 | LU |
| WK80L112Q: Languages and Compilation | Compulsory | 15 | 3 | 48 | Exam | N | 1-12 | 4 | BJTU |
| WK80L115Q: Advanced Internet Applications | Optional | 15 | 3 | 48 | Exam | N | 1-12 | 4 | BJTU |
| WK80L116Q: Computer Science Seminars | Optional | 15 | 0 |  |  |  |  |  | BJTU  & LU |
| Credits Required | Credits Recommended: 8 Compulsory Credits + 3 Optional Credits | | | | | | | | |

### Year 3: Spring Semester

| **Course Name** | **Compulsory**  **/Optional** | **LU**  **Credits** | **BJTU**  **Credits** | **Hours** | **Exam**  **/CWA** | **LG**  **/ N** | **Teaching**  **Weeks** | **Hours**  **/Week** | **Taught**  **by** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| WK80S206Q: Final Year Project | Compulsory | 30 | 6 |  | CWA | N | 1-10 |  | BJTU  & LU |
| WK80L113Q: Artificial Intelligence | Compulsory | 15 | 3 | 48 | Exam | N | 1-12 | 4 | BJTU |
| WK80L114Q: Security and Risk | Compulsory | 15 | 3 | 32 | CWA | N | 5-16 | 4 | LU |
| WK80L116Q: Computer Science Seminars | Optional | 15 | 3 | 48 | CWA | N | 1-12 | 4 | BJTU  & LU |
| WK80L118Q: Media Coding and Processing | Optional | 15 | 3 | 48 | CWA | N | 1-12 | 4 | BJTU |
| WK80L117Q:Advanced Networking | Optional | 15 | 3 | 48 | Exam | N | 5-16 | 4 | LU |
| WK80L119Q: Embedded Systems | Optional | 15 | 3 | 48 | CWA | N | 1-12 | 4 | BJTU |
| Credits Required | Credits Recommended: 12 Compulsory Credits + 3 Optional Credits | | | | | | | | |