Welcome to SSE of BJTU, CHINA

2014

GUIDE FOR STUDENTS

BEIJING JIAOTONG UNIVERSITY
School of Software Engineering
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INTRODUCTION

About Beijing

China is a wondrous, awe-inspiring country. It has a history of five thousand years, and it is the only ancient civilization in the world to have continuity into the present. Other ancient civilizations have withered or perished. However Chinese culture is coherent and dynamic, that China has been able to constantly regenerate and revitalize itself, standing the test of time. Beside its rich and profound culture, in recent decades China has achieved remarkable advances in both social and economic spheres. Among them, the software industry in China is surging rapidly with the development of science and technology.

The School of Software Engineering at Beijing Jiaotong University is centrally located in Beijing, which is the center of the nation’s politics, culture and international exchanges. If you can only visit one city in China, it should be Beijing, because many of the capital's “bests” are also China's “bests”. Most known among these are the Forbidden City, the Temple of Heaven, Tiananmen Square and the Great Wall, which is the only man-made structure visible from space.

If you haven’t been to China, you won’t yet have experienced a place where ancient beauty and modern cities intermingle so well. The extravagant building projects of the 2008 Beijing Olympic Games, include the eye-catching "Bird’s Nest", and the "Water Cube", the largest aquatic center in the world. These amazing feats of architecture coupled with China’s diverse culture have made Beijing a world-renowned city. Beijing contains 5,000 of China’s cultural heritage sites along with the advancing knowledge and ideas of our modern society and scenes foretelling the world’s cosmopolitan future.

Welcome to Beijing! Welcome to Beijing Jiaotong University!
School Profile

Introduction to Beijing Jiaotong University

http://www.bjtu.edu.cn

Beijing Jiaotong University (BJTU) is a national research university which has 117-year history, and one of the “211 Project” universities under the direct administration of the Ministry of Education (MoE). At present the university has 2,842 full-time employees, 14000 undergraduates, 2200 doctoral candidates, 5900 graduates, 5000 in-service professional degree graduate students, 724 international students and more than 100000 students have graduated from the university over the past 117 years.

The University is located in Beijing’s Haidian District, which is known as China’s “Home of Higher Education”. To the north of the University is Zhongguancun, which is known as China’s “Silicon Valley”. The University covers an area of 73 acres and is composed of east and west campuses. The campuses have complete facilities and beautiful environment. And a new campus will be constructed in Pinggu district of Beijing.

The University has 14 academic faculties. The University has 34 master’s programs and 20 doctoral programs under first-level discipline categories, 15 post-doctoral research stations, and 10 professional degree programs.

BJTU has put great emphasis on enhancing international cooperation in education and has always taken strengthening international cooperation as an important way to promote the development of BJTU. The University has established concrete cooperative relations with more than 10 countries such as America, Britain, Germany and France, and over 60 universities in these countries. To encourage the culture communication among the various country students, the International Culture Festival is been held every 2 years in the university.
About SSE

http://rjxy.bjtu.edu.cn

Founded in March 2003, the School of Software Engineering (SSE) became one of the National Pilot Software Engineering Schools among top 37 universities first accredited by Ministry of Education in November 2006. Aiming at being a top-ranked international school and educating innovative software engineers, School of Software Engineering offers students unique education by emphasizing on industry-oriented, real-world project capacity, team spirit and hands-on practical experience to match industry requirements.

SSE has two Ministry of Education featured programs, the school is comprised of Department of Software Engineering, Department of Digital Media and Software Engineering Experiment Teaching Demonstration Center, measuring more than 3,000 square meters. The school has established concrete cooperative relations with more than 19 well-known universities in USA, Canada, Australia, Britain, Germany and France, and over 40 well-known enterprises domestic and overseas. SSE has explored actively co-operative education management system security mechanism for cultivation of talents. We constructed the curriculum system which focuses more on abilities training and improves teaching quality.

As of now 1500 students graduated from SSE. SSE has over 1300 current students, of which 720 undergraduates, 280 graduates, 4 doctoral candidates, over 300 international students.
**SSE Offers**

**English Program**
SSE uses the latest in international standard education system: including curriculum system, teaching content, teaching methods and other aspects of international education standards. All undergraduate and graduate courses are in English.

**Teaching Team**
SSE has a highly qualified international team, including 20 full-time teachers, 35 part-time teachers from enterprises and 17 foreign teachers, all of them have a rich software development engineering experience.

**Abilities Training**
SSE is a world-leading engineering school, and also a member of the CDIO Initiative™ Federation. Guided by CDIO educational philosophy, the school works closely with companies and organizations, creates and develops new software engineering courses, training students to master cutting-edge technologies in the field of software engineering including knowledge of international rules. The School has a project based learning education involving real projects from enterprises, with students learning by doing and training to their highlight abilities such as: focus on lifelong learning, teamwork, innovation and entrepreneurship, multicultural communication skills, software development and design, ability to adapt to the international environment and other abilities.

**Multi-cultural Environment**
SSE has more than 1,500 students, of whom 30% of the students are from the United States, France, Spain, Germany, Switzerland, South Korea and other countries.
Here, from all around the world international students choose and take courses with Chinese students together. Furthermore, we have outstanding teachers and enterprise experts from around the world to teach students. School of Software Engineering has recruited international administrative staff to achieve a unified management for Chinese and international students. The School also established the Buddy Plan, as arranging a Chinese student partner for every international student, so that student will integrate more easily with Chinese culture, studies and life.

**Excellent internship opportunity**
SSE has established an internship and employment base at Microsoft, Oracle, SAP, Google, Baidu, Digital China, Huawei, Neusoft, Chinasoft and 45 other famous domestic and international software enterprises. Moreover, the School set up a special guidance center to assist and recommend students for internship and employment. All School graduates employment rate is 100 per cent.

**Chinese Culture Experience**
The School offers to all international students Chinese language courses, regularly organize students to visit cultural attractions in Beijing. In China’s traditional festivals such as Dragon Boat Festival, Mid-Autumn Festival and Spring Festival, the School organizes different activities to experience the profound Chinese culture. The International Culture Festival has already become a platform for cultural exchange between students from different countries.

**Scholarship & Financial Aid**
To encourage outstanding students, the School offers a number of different scholarships, such as: Chinese Government Scholarship, Beijing Municipal Government Scholarship, Beijing Jiaotong University Scholarship and others, while also providing teaching assistantships, research assistantships and other paid internship and trainee positions.
COURSES

Undergraduate Program

The major of Software Engineering takes open type and international cooperation training mode to cultivate elite who can get used to the development of the industry requirement, and have solid professional theory basis & strong practical skills. With all these skills, students are becoming elites who can design and develop computer systems software and application software. The major of Software Engineering values the combination and practice. The first 2 years of undergraduate program emphasize on the basic theory of computer science and technology. The last 2 years focus on the software specialty knowledge and practicing them by real projects. Other than these courses, students will attend other trainings like Class Projects Training, Practical Project, Enterprise Internship, and graduate design. With the help of teachers from school and technical staff from companies, students can participate in the analysis, design and development of some high level software development, and finally become an engineer with the knowledge of project management and teamwork spirit.

Technical direction of software engineering training to solid software analysis, design, development of basic theory, but also has some knowledge of project management software, the integrated use of the knowledge and skills to analyze and solve practical problems of high-quality, practical software engineering talent.

Direction of digital media technology training to master both game design and development, computer animation, digital audio and video and other digital media related to the basic theory, but also has high artistic accomplishment, the integrated use of the knowledge and skills to analyze and solve practical problems in science and art of combining the compound talents.
Undergraduate Courses List for transfer students (2+2)

(the details see the course description)

<table>
<thead>
<tr>
<th>NO.</th>
<th>Course ID</th>
<th>Course Name</th>
<th>Hours</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A0L237Q</td>
<td>Object-Oriented Programming and Design</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>A0L323Q</td>
<td>Introduction to Software Engineering</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>A0S174Q</td>
<td>Practice in Object-oriented and Interactive Application Development</td>
<td>64</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>A0L235Q</td>
<td>Introduction to Software Engineering Major II</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>A0L240Q</td>
<td>Operating System</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>A0L241Q</td>
<td>Database System</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>A0S176Q</td>
<td>Comprehensive Practice on Database Application System</td>
<td>64</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>A0L248Q</td>
<td>Software Architecture</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>A0S179Q</td>
<td>Comprehensive Practice of Software Engineering</td>
<td>64</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>A0L243Q</td>
<td>User Interface Design and Evaluation</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>A0L282Q</td>
<td>Principles of Computer Organization</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>A0L242Q</td>
<td>Computer Network</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>A0L255Q</td>
<td>Quality Assurance</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>A0L256Q</td>
<td>Data Mining and Data Analysis</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>A0L257Q</td>
<td>Distributed Computing</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>A0L258Q</td>
<td>Service Oriented Architecture</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td>A0L259Q</td>
<td>.NET Framework and Application</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>A0L232Q</td>
<td>Principle and Application of ERP</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>19</td>
<td>A0L265Q</td>
<td>Research Methodology of Software Engineering and Creativity Education</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>A0L300Q</td>
<td>Elementary Chinese</td>
<td>64</td>
<td>4</td>
</tr>
<tr>
<td>21</td>
<td>A0L306Q</td>
<td>Spoken Chinese</td>
<td>32</td>
<td>2</td>
</tr>
</tbody>
</table>
LIFE

Campus Life

There are dormitories, restaurants, supermarkets and other services on campus to facilitate Chinese and international students’ daily life. Provide on-campus accommodation for all students, two people in a room dormitory with bathroom, shower, TV, air conditioning and other facilities, 24-hour hot water, communal laundry room and kitchen, providing gigabit network access. There are various student organizations to provide students a platform for Chinese and international students exchange, regularly organize sightseeing, various sports events, festivals party, etc. to enrich students’ extracurricular life.

Here is an estimate of monthly living expenses for a student in Beijing:

<table>
<thead>
<tr>
<th>Service</th>
<th>Monthly Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlimit internet access</td>
<td>11 US$</td>
</tr>
<tr>
<td>3 meals per day in student canteen</td>
<td>6 US$ (in student canteen)</td>
</tr>
<tr>
<td>Electricity per month</td>
<td>10 US$</td>
</tr>
<tr>
<td>Laundry</td>
<td>12 US$</td>
</tr>
<tr>
<td>Public transportation</td>
<td>15 US$</td>
</tr>
<tr>
<td><strong>Total expenses per month</strong></td>
<td><strong>230-300 US$</strong></td>
</tr>
</tbody>
</table>

(Up to where to eat)
Accommodation

All the international students may live in dormitory on campus. You can find some information here about on campus dormitories offer.

1. Room type B (Standard Double Room of Block C International Students Dormitory)

Long-term per bed/per semester: 7280RMB (about 1220 US$)
Short-term per bed/per day: 65RMB (about 11 US$)

- Each room is 20 square meter with simple decoration
- Private toilet
- Private shower room
- Public laundry for each floor
- No kitchen
- TV
- Air conditioner
- Telephone
- Internet Access
- Desks, chairs, wardrobes, bookshelf, beds and beddings are provided
2. Room type C (Superior Double Room of Block C International Students Dormitory)

Long-term per bed/per semester: 8400RMB (about 1400 US$)
Short-term per bed/per day: 80RMB (about 14 US$)

- Each room is 20 square meter with full decoration
- Private toilet
- Private shower room
- Public laundry for each floor
- Public Kitchen for each floor
- TV
- Air conditioner
- Telephone
- Internet Access
- Desks, chairs, wardrobes, bookshelf, beds and beddings are provided
SCHOLARSHIP AND APPLICATION

How to Apply to Chinese Government Scholarship

<table>
<thead>
<tr>
<th>Scholarship Program</th>
<th>To Whom</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese Government Scholarship</td>
<td>For undergraduate and postgraduate students National: USA; GPA: above 2.0</td>
<td>(1) Exempt from registration fee, tuition fee and fee for accommodation on campus; (2) Monthly living allowance: 1,400 CNY /Person /Month; (3) One-off settlement subsidy after registration: 1,500 CNY/Person</td>
</tr>
</tbody>
</table>

Note: For EDMONDS College students, there will be 10 quotas for the Chinese Government Scholarship.

For details please refer to: [http://www.csc.edu.cn/Laihua/scholarshipdetailen.aspx?cid=97&id=3056](http://www.csc.edu.cn/Laihua/scholarshipdetailen.aspx?cid=97&id=3056)

Applicants for Beijing Jiaotong University shall register at China Scholarship Council’s online application system [http://laihua.csc.edu.cn](http://laihua.csc.edu.cn) (our agency No: 10004) and post hard copies of application documents before March 31st, 2014 to 814# YiFu Building, Software Engineering School, Beijing Jiaotong University, 3# Shangyuancun, Xizhimenwai, Haidian District, Beijing, 100044, P. R. China

Contact: Jenny TANG

Email: sse.info@bjtu.edu.cn, sse.bjtu@gmail.com

Tel: 0086-10-5168 7122, 0086-10-5168 3811

How to Apply to SSE

Please visit website [http://study.bjtu.edu.cn](http://study.bjtu.edu.cn) to apply to SSE.

List of documents to bring for the registration:
(1) Application Form for Overseas Academic Program of Beijing Jiaotong University;
(2) Notarized diploma and transcripts in English or Chinese (originals should be shown at registration);
(3) Passport photocopy (scanned copy or facsimiled copy);
(4) 2 inch passport-size photos with light blue or white background (minimum size 640 × 480 pixels);

If you can’t visit the website, please send all documents to sse.bjtu@gmail.com or sse.info@bjtu.edu.cn.

Note: Please submit both application of Chinese Government Scholarship and application of SSE.
Schedule and Fees

Fall Semester: Apply before March 31st. Open on the end of August.

<table>
<thead>
<tr>
<th>Charging Item</th>
<th>Fee</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Fee</td>
<td>¥ 600 (about US$ 100)</td>
<td>once</td>
</tr>
<tr>
<td>Dorm Deposit</td>
<td>¥ 500 (about US$ 95)</td>
<td>Refunded</td>
</tr>
<tr>
<td>Medical Certificate</td>
<td>¥ 60-400 (about US$ 10-70)</td>
<td></td>
</tr>
<tr>
<td>Residence Permit</td>
<td>¥ 500 (about US$ 75)</td>
<td>per year</td>
</tr>
<tr>
<td>Insurance Fee</td>
<td>¥ 600 (about US$ 100)</td>
<td>per year</td>
</tr>
<tr>
<td>Visa</td>
<td>¥ 700 (about US$ 105)</td>
<td>once</td>
</tr>
<tr>
<td>Tuition Fee</td>
<td>¥ 29000 (about US$ 3500)</td>
<td>per year</td>
</tr>
<tr>
<td>Dormitory Fee</td>
<td>¥ 8400 (about US$ 1400)</td>
<td>per semester</td>
</tr>
</tbody>
</table>

CONTACT US

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No.3 Shangyuancun, Haidian District
Tel: +86 10 51687122, +86 10 51683811
Fax: +86 10 51687356
Email: sse.info@bjtu.edu.cn, sse.bjt@gmail.com
Skype: sse.bjtu
Website: http://rjxy.bjtu.edu.cn/bjtu/index_en.jsp
COURSES DESCRIPTION

Undergraduate Program

1. Object-Oriented Programming and Design
The main goal of the Object Oriented Programming Language course is to provide you with the knowledge and skills necessary for object-oriented programming of advanced Java applications. The course mainly about the basic knowledge of Java programming language, also introduced object-oriented programming methods and characteristics, basic java programming techniques, such as graphical user interfaces (GUIs), multithreading, exception handling, input and output streams, and network programming, etc. Learning through this course, students can master the development of Java object-oriented programming knowledge and skills necessary for the development of large and complex applications and lay a good foundation for future study.

2. Introduction to Software Engineering
“Introduction to Software Engineering” is the core course for Software Engineering major students. The course doesn’t aim to teach in detail someone technique or tool for software development, which will focuses on the systematic knowledge and methodology in software engineering major by introducing the study case. Through this course, students will be equipped with the macroscopic and systematic views on software engineering, learn of the major knowledge areas and structure, and understand software engineering from system and engineering perspectives. The main content covered in the course is as following: (1) Concept on software and software engineering; (2) Software process and modeling from the view of software system development; (3) Software quality management from the view of quality assurance; (4) Software project management from the view of project. Students will learn about and understand the knowledge structure on software engineering major, use modern software modeling methods, develop software system by using advanced platform and tools, build the good system and engineering awareness, grasp the engineering principle (including technique, method, tools and environment) to develop and manage software system. The course lays a solid foundation for sequential specialty courses and the systematic engineering analysis and design in the real world project development.

3. Practice in Object-oriented and Interactive Application Development
This is one of the integrated practical courses for students majoring in software engineering. The course focuses on the practice in GUI and object-oriented design and programming, aiming to help the students with basic programming skills. The objectives of the course includes: mastering the object-oriented analysis, design and implementation technologies; mastering the user interface design and evaluation rules and methods; and learning to use object-oriented technologies and user interface design and evaluation technologies to develop the interactive applications with graphic user interface. The students are required to comply with the standardized software development process including analysis, design, coding, debug, test and submission, and to complete interactive GUI applications in accordance
with mission requirements, prepare the documents of the software project, finally complete the project with presentation.

This course is divided into three parts. The first part is course experiments, the second the integrated curriculum designs, and the third the real enterprise projects.

After the course, the students can lay a solid foundation for the development of large-scale and complicated enterprise software applications.

4. Introduction to Software Engineering Major

“Introduction to Software Engineering Major” is the core course, as well as the introducing course for the freshmen of Software Engineering major. The main five parts are covered in the course: (1) Software and software engineering concepts, including software and its components, software features, classification, crisis, software engineering, ten phases of software lifecycle, to understand what’s software and software engineering, etc.; (2) Software engineering knowledge structure according to SWEBOK, SE2004 and CDIO, to understand the major knowledge and discipline development; (3) Software talents training, including problems analysis, key factors and goals, major and curriculum introduction, software talents training approach, international teaching and learning environment, etc., to understand how to be a high-qualified internationalized software engineer; (4) Software industry, including global and Chinese software marketplace, software talents demands, etc., to learn about the development and talents demands of software industry; (5) Talks and visit in company, to learn of edge-cut techniques and experience real working environment.

By the end of this course, students will be able to:
Learn of the systematic knowledge structure in software engineering major;
Understand the concept of software and software engineering;
Learn about the internationalized software talents training;
Learn of the software industry development and talents demands;
Have perceptual knowledge on the real working environment.

5. Operating System

OS (Operating System) is a kernel course in computer science and software engineering. Many concepts and techniques introduced in OS, including memory management, synchronization, deadlock, file management etc., are the basis to understand the mechanism of many other important systems, such as DBMS (Database Management System), Embedded System, High-Performance Servers, Parallel systems, etc. If you’ve noticed that those above systems are the basis of our information society, you must agree the importance of learning OS well. Besides, as the complex enough software for students, many ideas and algorithms covered by OS could be used as good practices for students to exercise their knowledge learned from other courses before, including Programming (A0L236Q), Computer organization (A0L328Q) and Data structure (A0L238Q). After the projects of this course and later training part, the students’ programming skills could be much improved.

6. Database System

Database System is a core course of Software Engineering and other related disciplines. It is for sophomores majoring in Software Engineering. This course provides an introduction to relational database systems. The topics covered in this course include fundamentals of database architecture, the relational model, Structured Query Language (SQL), query processing, query optimization, schema normalization and integrity constraints, database design theory and methods, transactions
management, database recovery, concurrency control and database security.

Database system is a combination of theory and practice. This course is aimed at improving and strengthening the understanding of the database principles and hands-on skills. It will not only bring students the professional knowledge, but also the capability of analyzing and solving problems. It will as well improve students’ logical thinking skill and make students meet the demand of industry.

After studying of principles and applications of database design in this course, Students will learn how to use a relational database system and write programs in SQL, and learn how to design and implement a web-based application database system. They also will know about the development trend of Database theory and technology.

7. Comprehensive Practice on Database Application System

Comprehensive Practice on Database Application System is a core course of software engineering and other related disciplines. It is for sophomores majoring in software engineering.

Students successfully completing this course will know the principles of operating and database system, understand and grasp the kernel algorithms of operating system and database system, be able to manipulate proficiently the data over a certain DBMS, and design and implement a database application system based on web.

This course includes two sections. The first section consists of several basic course practicing on database system and operating system; and the second section is an enterprise project training which is a database application system based on web.

8. Software Architecture

The course is one of main courses for Software Engineering specialty. The motivation is to make students to further study the ideas and methods of modern software architecture design and be able to grow into an excellent software system architects in five to eight years after their graduation.

The course mainly comprises three parts, the idea of software architecture design, principles of object-oriented design, and design patterns. In the course, students need to learn the basic concepts of software architecture, software architectural style, principles of object-oriented design, design patterns, software product line and quality attributes. During the course learning, students are required to grasp the knowledge points and the software design methods, and apply the theory and methods learned in the course to solve practical engineering problems according to the actual situation of projects. By the end of this course, students will be able to Grasp the idea of architecture design in the field of software engineering. Apply software architectural styles into software architecture design of real projects from industry. Utilize design patterns in the detailed design of software projects from industry. Find and abstract new software architectural styles or design patterns from the development of software.

9. Comprehensive Practice of Software Engineering

This course is designed to provide students a several-week long immersion in the development of software systems with a focus on software engineering development and management processes and practices adopted by the leading software developers. The training will stimulate the real development environment and based on the real user requirements.

The training is designed to help the students to develop the skills that will enable them to capture the need from the users and transform the users’ needs to a holistic software solution and enable them to construct software with proved quality.

The training focuses on fostering students’ understanding on the technological areas such as
software analysis and design, project management and quality assurance and improving their working and communication skills in a collaborative developmental environment.

10. User Interface Design and Evaluation
User interface is essential to successful software design. This course combines a component that teaches programming interactive user interfaces with one that teaches methods to evaluate and improve the usability of those interfaces.

This course is organized into four parts - the basic psychology for interface design, a rapid-prototyping programming language, interface design and interface evaluation.

Students successfully completing this course will be able to design and create usable, human-friendly user interfaces, critically evaluate the usability of user interfaces, including those that are not computer-based and report their findings in a systematic fashion.

11. Principles of Computer Organization
The course explains a single computer principles and internal operating mechanism, including arithmetic unit components, controller parts, memory subsystem, input/output subsystem (bus interface), and input/output system device. Knowledge is introduced for each part, which includes the function, composition, design and implementation. Through the study of this course, students should to be able to understand the general computer Organization, the principle and internal operation mechanism, and build up the foundation for learning the professional successor courses and hardware-related technical work.

12. Computer Network
Through this course, the students will be aware of the basic concepts of computer network, and acquire the in-depth understanding of the basic working principles of network and protocol designs. They will master the computer network architecture and standards, the network practical techniques, and be familiar with a variety of network technology, as well as the basic principles of network management, network security, and the related methods and technologies.

13. Quality Assurance
"Quality Assurance" is an important course for the undergraduate software college students. It is for the students after taking courses like Software Project Management and Software Testing Technology, whose aim is to help the students master the basic elements of management in the software projects, the technical means to improve product efficiency and quality of the whole project, and to further improve the maturity of software enterprise management.

Through the analysis of and characteristics of quality and software projects, the course introduces the key process and activities to ensure the quality of software, and focuses on how to use peer review method in the early stage of the project, to build defect prevention model for quality control. And through the introduction of international advanced quality assurance model and standard, the course focuses on these methods in the project to ensure the project to improve its quality and optimize the project process. This course will also introduce how individuals, as software engineers, use international advanced methods of personal software process improvement and quality control of PSP self-process.

14. Data Mining and Data Analysis
Along with the widespread use of IT techniques, many companies have collected huge business related data from their everyday activities. It is more and more important to distill valuable information to help business decision. And data analysis is becoming more and more popular. The requests for qualified data analysts are then becoming indispensable for business enterprises to
ensure their competitive power and advantage.
The course tries to expand the abilities of juniors majoring in software engineering. It is necessary for them to master concepts and techniques closely related to practical implication. From the instruction of the course they will master the basic knowledge of data mining and analysis, frequently used methods and models to enhance the students’ hand-on ability and innovative ability. Aiming to introduce the basic concepts and techniques of data analysis, the course covers many topics including the models, algorithms and techniques for users to understand the data, and make appropriate decisions based on the data. The first part of the course is focused on distilling from statistics, one popular technique helpful for users to understand data. The second part of the course is data mining, which aims to discover valuable knowledge from the huge collection of data. The third part is the introduction of popular software used now in real applications to data analysis, such as Data Warehouse, OLAP (On-Line Analysis Processing), etc.

To ensure the ability of data analysis after this course, many manual computation questions will be used during the course. And many practices will be proposed as projects for students to use given data and software (SPSS, Clementine – now called SPSS Modeler, Weka) for data analysis. Students are required to finish a document for each project to demonstrate their understanding of the related algorithms, and data processing procedure. By those assignments, students can not only understand the related concepts, algorithms and techniques of data analysis, but also master the necessary skills to carry out data analysis, like using software, and writing documents.

15. **Distributed Computing**

This is designed for the third year students as a technical elective course. With the growth of applications via internet and cloud computing, our computing environment is more and more focusing on the net-centric computing. Distributed computing, which is distinct from the communication and network, provides a higher level of abstraction to deal with the programming paradigms, toolkits and protocols and standards in the context of net-centric computing.

In a field as wide as the distributed computing, it is impossible for one course to cover all the disciplines and topics, therefore this course is designed for undergraduate students to understand the basic principles of the distributed computing, focusing on the upper layers of the net-centric computing, specifically on distributed paradigms and incorporating both theoretical and practical topics to enable the learn-by-doing approach.

16. **Service Oriented Architecture**

This is designed for the third year students as a technical elective course. In this course, we will introduce the service oriented architecture from both an architectural and development perspective. We will learn the concepts as well as the principles and patterns of Service Oriented Architecture (SOA), and also the implementation of these principles and patterns in a modern SOA platform. In particular, we will cover the principles of service oriented analysis and design, second generation web service standards, enterprise service bus (ESB) functionality and web service orchestration using the Business Process Execution Language (BPEL). More specifically, from this course, we will learn to:

1. Design and apply modern SOA — specific methodologies, technologies and standards;
2. Evaluate and analyze an organization to map it as a "set of services";
3. Develop service architectures using the Service-Oriented Modeling Framework (SOMF);
4. Convert logical designs into specifications to drive any development environment;
5. Orchestrate services to create new applications by leveraging SOA. A hand-on exercise with programming activities using SOA tools will also be included in this course. So that the students will be able to get the first hand experience of:
   - Mapping an organization as a set of services;
   - Driving service design from business requirements;
   - Modeling the SOA messages from business use cases;
   - Orchestrating services in SOA to create new applications;
   - Designing composite services by applying the optimal composition style.

17. .NET Framework and Application

.NET Framework is a software framework developed by Microsoft that runs primarily on Microsoft Windows. It includes a large library and provides language interoperability across several programming languages. This course will cover various aspects of .NET knowledge to help students use skillfully VSTS to develop wonderful applications.

The main contents include the basic concepts of the .NET framework, C# grammar, object-oriented design, ADO.NET, XML processing, and Windows Form Programming, GDI drawing, ASP.NET, Web services, file and registry operation, and Windows phone APP development, etc.

This course emphasizes on practice. Students will complete at least 5 typical .NET applications as the homework and complete one .NET enterprise application as the final project. In addition to the .NET programming, the students will learn how to design .NET application architecture at the enterprise level.

18. Principle and Application of ERP

The aim of this course is to enable the students to master ERP, the advanced management ideas and technologies widely used in the manufacturing sectors, distribution and services with significant economic benefits. It will broaden the students' knowledge, enhance their career strengths and professional state.

The concepts and methods of ERP epitomize the objective laws and the demands in the process of the production and management for manufacturing enterprises. Its functions comprehensively cover the processes of entire production and management and all financial activities, involving market forecasting, production planning, material requirements, capacity requirements, inventory control, workplace management and sales. The course is a comprehensive introduction to the basic principles, processing logic, implementation and operational and management methods and strategies about ERP. The students will acquire the perceptual knowledge of the data input and output and will experience the change of the cash flow and the information flow within the system by practicing on the computers. It will achieve the goal to develop the students' ability to put their knowledge into usage.

19. Research Methodology of Software Engineering and Creativity Education

There are four types of creations which are divided into theory, technology, method and application. Every type of creation locates on different level and represents different contributions in value. Moreover, creation can also be the innovation of different objects. These objects can be divided into the types of business, product and service. Creative talents are the elite groups who have the ability to recognize problems and scientifically solve problems to create value by comprehensively applying knowledge.

20. Spoken Chinese
This course is designed for the students to review what they have learned in the *Elementary Comprehensive Chinese* (Level One), which focuses to improve the students’ listening and speaking abilities. After this course, the students will be capable of understanding simple language materials related to their daily life and they will be familiar with the simple greetings. They will be able to communicate with others by simple words and sentence patterns, to follow, repeat or recite all the words and sentences that they have learned. Sometimes, with the help of the body language, they can answer simple questions, introduce themselves or others.

**21. Elementary Chinese**

After finishing the course, the students will be capable of pronouncing the basic sounds of Pinyin, mastering 300 words related to daily life and school life, recognizing strokes and their order in writing the characters. They will also know and master the basic word order, common sentence patterns, common nouns, numerals and measure words. The students will be able to enhance everyday communication abilities by using basic expressions and gain introductory Chinese cultural knowledge and acquire preliminary cross-cultural awareness and international perspectives.