Consolidate the Foundation and Keep Innovation to Build a World-class Undergraduate Education System with Chinese Characteristics

Xi’an Jiaotong University
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Part 1

Develop education with distinctive characteristics to make our country strong

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PART 1

**Mission:** Developing education to make our country strong, taking root in western China, giving service to the country.

- In 1896, Nanyang College was established to develop education, keep talents in reserve, and build a strong nation.
- In 1956, the main body of Jiaotong University was relocated to Xi’an in western China to respond to the call of the central Government. It has made irreplaceable and historical contributions to national higher education layout and structural optimization.
PART 1

XJTU has been listed in all national education support programs

XJTU: for the nation, for the country and for the times

- In 1959, XJTU was listed as one of the 16 key universities in China “Project 985”
- In 1984, XJTU was among seven key universities under the Government support
- In 1999, XJTU was one of the six priority universities in China “top-notch students training program in basic disciplines”
- In 2009, XJTU was listed in “top-notch students training program in basic disciplines”
- XJTU has been supported continuously under the “Project 211” and “Project 985”
Current Situation of XJTU

Xi’an Jiaotong University is a comprehensive research university with four campuses: the Xingqing campus, the Yanta campus and the Qujiang campus, covering an area of 2.0385 million square meters (about 203 hectares), and the new campus Western China Innovation Harbour under construction covers an area of about 3.6 million square meters (about 360 hectares).
PART 1

Orientation: *taking root in western China, giving service to the nation, developing into a world-class university*

- Western China accounts for 71% of the total area in China with a population of about 350,000,000 people accounting for 28% of the total. The GDP per capita is lower than 2/3 of China’s per-capita GDP, and is 40% less than that of the East.
- About 50% of the undergraduates in XJTU are from western China, with nearly 30% from Shaanxi Province; 60% of the postgraduates are from western China.
- Since it was renamed Xi'an Jiaotong University in 1959, XJTU has cultivated more than 240,000 students, of whom more than 102,000 working in western China; it has graduated 9,995 students with doctor’s degrees and 61,355 with master’s, of whom more than 32,600 Master’s degree graduates and more than 4,6200 graduates with doctor’s degree work in western China, accounting for nearly 60% of the total.

The fundamental goal of Relocating Jiaotong University to western China and its great mission ever since then has been to cultivate outstanding talents for the socio-economic development in western China!
Guiding Principle 1: Advocating morality and integrity

- **XJTU Motto:** Rigor, integrity, determination, and loyalty.
- **Spirit of Relocation to Western China:** Consciousness of overall situation, selfless contribution, promotion of good traditions, and appreciation of hard work.
- **XJTU Ethics:** Loving China and XJTU; Striving for the truth; Working conscientiously; and, Living a simple life.
- **XJTU Culture:** When drinking the water, forget not its source.
Guiding Principle 2: Pursuing rigorous scholarship and striving for excellence

- Love the country and honor XJTU to exercise their courage of shouldering responsibility;
- Be scientific and rigorous to train the quality of striving for excellence in scientific research;
- Organize and manage to develop the skill of collaborating and innovating leadership.

QIAN Xuesen, model of rigorous scholarship

- Scientific spirit of QIAN Xuesen: Being patriotic, advocating science, pursuing truth and serving the people.

Having found a symbol was missing in hydraulics exam, Qian Xuesen changed the mark from 100 to 96 after getting approved by the teacher.
Guiding principle 3: Higher starting point, more solid foundation, stricter requirements, more emphasis on practice, and stronger innovative ability

- **“Higher starting point”**: First, updating educational ideas and concepts. Second, providing students with cutting-edge knowledge and creating an environment of high level practice and innovation. Third, heightening the requirements of enrollment.

- **“More solid foundation”**: It reveals the basic task of our university teaching – consolidating the foundation in "basic theories, basic methods and basic skills" and training students in thinking.

- **“Stricter requirements”**: It is the central reflection of the spirit of being practical and pursuing excellence, shown in strict classroom teaching, assessment scores and rules.

- **“More emphasis on practice”**: “Knowledge and practice” educational model can closely link teaching with research, theory with practice, learning with application.

- **“Stronger innovative ability”**: Establishing innovative incentive mechanism with a solid foundation, good quality with high scientific and technological content.
Status and Contributions of Undergraduate Education: Innovative & Pioneering

- In the early 20th century, XJTU firstly set up majors including civil engineering, electrical engineering and navigation;
- In 1930s, XJTU gradually formed the educational pattern featuring three pillars, science, engineering, and management, and it began to integrate with the world and won the reputation of “Oriental MIT”;
- In 1956, XJTU consecutively established departments of radio engineering, engineering physics, mathematical mechanics, and new majors in national frontier domains including computer, nuclear technology, industrial automation;
- In 1985, XJTU founded the “Class for Exceptionally Gifted Joveniles”, which is the only education class for top-notch and innovative students enrolled from junior middle schools in China;
- In 1995, XJTU was first granted the title of “excellent university in undergraduate teaching”;
- In 2007, XJTU initiated the “QIAN Xuesen Trial Class” to carry out the reform pilot of engineering education, setting up QIAN Xuesen College in 2016 which is the only college named after QIAN Xuesen;
- In 2017, XJTU began to enroll students according to the category of disciplines and implement the new mode of education of “general education + wide-scoped major education”.
Inheriting, Innovating, Continuing to strive to Be a Pioneer in Education in the Future

The status of XJTU today has been built by 240,000 XJTU alumni, while the talents we cultivate now have the responsibility of shoring up status in the next two decades!

Nowadays, what should XJTU do to answer the call of the Party and the Central Government?

- XJTU will follow the call of the central government to cultivate students who will be “the light of the world”;
- Taking root in western China, giving service to the country, XJTU is working on the new campus Western China Innovation Harbour to explore the world-class education system with Chinese characteristics in 21st century;
- XJTU will address major scientific and technological issues in drives for innovation and the progress of human beings.
Part 2
Building a world-class undergraduate teaching system

Modes

Contents

Innovations
Ten Tasks: innovation in education modes and contents

1. Enrollment by category of disciplines and training mode
2. Outstanding teachers, high-quality courses and teaching materials
3. Intensive basic and general education
4. Intensive teacher training system
5. Optimized summer sessions for interdisciplinary practice platforms
6. Collaboration with enterprises for elite classes
7. Large-class teaching and small-group counseling
8. Project for international exchange and dual degrees
9. Cultural quality education for college students
10. Smart classrooms and educational informationization
1. Enroll students by category of disciplines to adapt to the new national policy for college entrance examinations

The enrollment for the 84 undergraduate majors is carried out under the 7 categories and 7 trial classes.

### 7 categories

<table>
<thead>
<tr>
<th>Category</th>
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<tr>
<td>1</td>
<td>Engineering Experimental Classes (Mechanical Engineering)</td>
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<tr>
<td>2</td>
<td>Engineering Experimental Classes (Electrical Engineering)</td>
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<tr>
<td>3</td>
<td>Science</td>
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<tr>
<td>4</td>
<td>Economic and Management</td>
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<tr>
<td>5</td>
<td>Medicine</td>
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<td>6</td>
<td>Humanity</td>
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<td>7</td>
<td>Foreign Languages</td>
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### 7 trial classes

<table>
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<td>Hou Zonglian Medical Trial Class</td>
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<td>3</td>
<td>Science Trial Class</td>
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<td>4</td>
<td>Science Trial Class</td>
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<td>5</td>
<td>Science Trial Class</td>
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<tr>
<td>6</td>
<td>Science Trial Class</td>
</tr>
<tr>
<td>7</td>
<td>Special Class for Exceptionally Gifted Youth</td>
</tr>
</tbody>
</table>
2. The project for developing outstanding teachers, high-quality courses and teaching materials

Outstanding teacher training project 3.5 million yuan
- By 2020, we aim to train 5 teachers to be national-level Outstanding Teachers, 30 at the provincial level, and 100 at the XJTU level

Project for developing quality courses and teaching materials 5.5 million yuan
- By 2020, we plan to develop 50 core courses for general education
- 80 brand courses (50 for undergraduates, 30 for graduates), 100 publications of national planning text-books (75 for undergraduates, 25 for graduates)

Project for developing teaching resources 5.5 million yuan
- At least 50 on-line MOOC courses, with at least 2 million registered learners
3. New mode of education (general education + wide-scoped major education)

**Enrollment by category of disciplines**

**General and basic education**
General education, basic courses in natural sciences introduction to discipline, fostering education for freshmen

**wide-scoped disciplinary major education**
platform courses for categories of disciplines (experimental platform)

- **Specialized core courses, specialized elective courses**

**Postgraduate**

- **Professional Academic**
- **Interdisciplinary**
- **Employment/Professional Application**
- **Business Creating**

**Society**
4. Strengthening teacher development in teaching methods

In order to enhance teachers' teaching ability and professional quality, a new system for teacher training and teaching research has been formed with the support of the national teachers' development center.

- Instructing and helping teachers to carry out teaching research to improve their teaching ability
  --- expert guidance, theoretical improvement, outcome condensation, exchanging popularization
- Renewing teaching concepts, innovating teaching methods, and constructing teaching culture
  --- raising questions, discussing hot issues, researching together, testing through practice
- Establishing teaching research projects to encourage the application of research results in teaching practice
  --- to improve the professionalization of education and to promote the combination of teaching and research
5. The establishment of 8 interdisciplinary practice and innovation platforms

- Energy and Chemical Industry
- New Materials
- Aeronautics and Astronautics
- Civil Engineering
- Biological Medicine
- Electronic Information
- Smart Electrical Equipment
- Electromechanical Integration
6. Partnering with enterprises to create elite classes

- **Objective:** To integrate innovation and entrepreneurship education into talents training system; partnering with famous scientific research institutions and leading enterprises at home and abroad to carry out collaborative education; improving students' innovative consciousness, spirit, and competence on knowledge application and research-driven learning.
7. Implementing the practice of teaching in large-sized classes, but tutoring in small-sized classes

- **Objectives and Tasks:**
  - A joint working group is set up by the Graduate School, Office of Teaching Affairs, and Teacher Development Center.
  - All basic courses, all general core courses, and some specialized core courses are covered.
  - Each year about 1200 teaching assistant positions are to be advertised, and all doctoral students are required to fulfill the 2-credit requirement of teaching assistantship before graduation.
  - The information management system is set up to offer positions, special training for candidates, process evaluation, better payment for better work, and dynamic employment is to be practiced.
8. Making distinctive plans for Schools to promote international exchanges

**Objectives and tasks:** by 2020, the proportion of undergraduates who have studied abroad will be up to 35% of the total student population compared with that of 2015, when less than 15% of the students had the experience.

**In**
1. Expanding exchange projects, 2+2, 3+1
2. Implementing ABET Professional Accreditation on dominant specialties
3. Striving for CSC plans
4. Enhancing trainings on international exchanges
5. Improving students' English competence
6. Setting up special funds

**Out**
1. Integrating it into undergraduate and graduate enrollment systems
2. Offering more English and bilingual courses
3. Encouraging more professors to supervise overseas students
4. Increasing overseas publicity
5. Improving overseas students' living conditions
6. Setting up special scholarships
9. Implementing comprehensive quality education to the students

1. Fulfilling missions to cultivate excellent students
   Advocating the core values of socialism; impressing the teachers and students with Jiaotong University's profound culture and the spirit for relocation to western China

2. Fulfilling "four tasks of 100 " to improve humanity qualities
   Students who fulfill "four tasks of 100"---reading 100 Classics, attending 100 lectures, getting acquainted with 100 teachers, participating in 100 activities---will obtain 8 extracurricular credits.

3. Promoting "to be a thinker" to improve comprehensive abilities
   Sticking to the orientation of "four services", the university carries forward the project "to be a thinker" by implementing the constructions on ideology, academic training, and culture.

4. Practicing “sports spirit" to make lifelong contributions to the country.
10. Setting up smart classrooms to build a big data platform to monitor the quality of classroom instruction

- Data of student attendance: 187,726 pieces daily, 1,314,083 pieces weekly
- Class videos: 110 clips so far, full-length, and real time; with 12 sampled photos for each classroom session, amounting to about 6,870 photos daily (600MB); reaching a total of 48,000 photos per week (4GB), with a semester collection of 80GB of photos.
- By April 30, 2017, the platform had collected 98,670,000 pieces of data from over 2,200 courses.

Accurate findings: where the students had gone, which courses the students were strongly interested in.
Cultivating upstanding, industrious and truth-seeking talents; Making great contributions to China and the whole world.
With a long history of over 120 years, Jiaotong University has spanned three centuries, surviving many vicissitudes intact. Today, Xi’an Jiaotong University is standing at a new historical starting point; we will persistently adhere to the core goal of educating people, take root in western China, serve the country, and remain the leading role in student education, scientific research, social services and cultural heritage and innovation.
Thank you!