

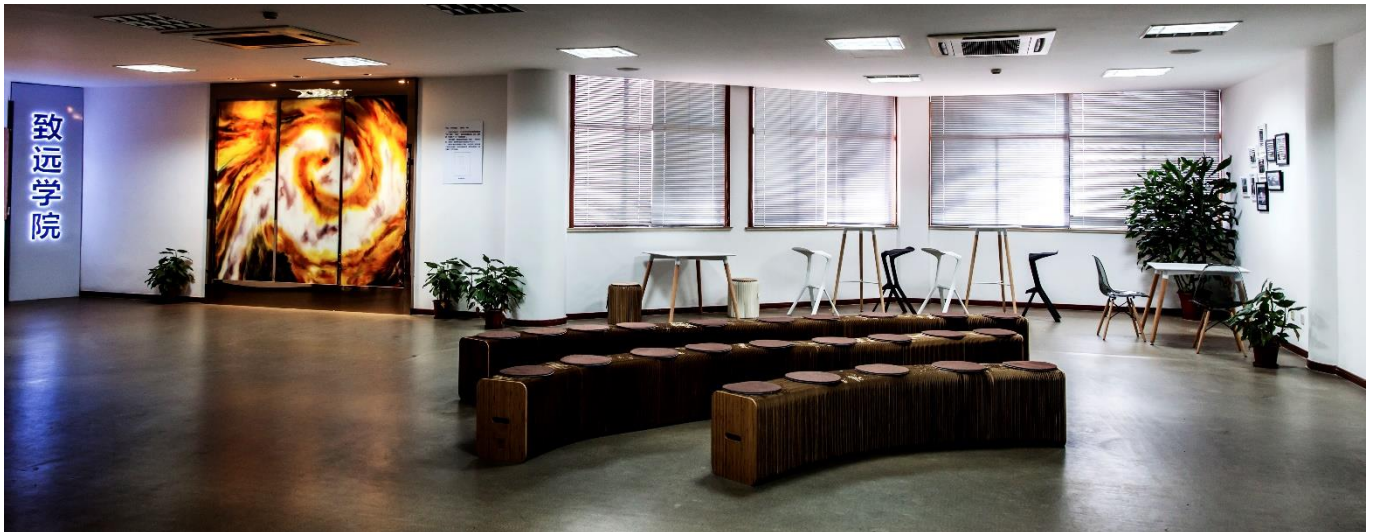


上海交通大学
SHANGHAI JIAO TONG UNIVERSITY

Zhiyuan College

<http://zhiyuan.sjtu.edu.cn>

Zhiyuan College is dedicated to cultivate curiosity-driven future scientists by transforming students' curiosities into an aspiring learning and creative activities, enhancing students' higher academic pursuits, stronger challenge spirits and more initiative cooperation consciousness, cultivating them to be future scientific leaders with critical thinking, knowledge integration, communication and collaborations, as well multicultural understanding and global perspectives.





In order to fulfill Zhiyuan's objectives, we have designed a framework to combine a residential college (Zhiyuan College), an institute (Institute of Natural Sciences, INS) and an innovative center (Zhiyuan Innovative Research Center, ZIRC) into a single program. The college is responsible for enacting of cultivation plan, recruiting faculty fellows and arranging pedagogical practice. INS serves as an interdisciplinary research platform of basic sciences of SJTU and an academic supporting base of the college. ZIRC is specifically designed to be a multidisciplinary research platform to facilitate students' innovation.



According to the achievement motivation mechanism of success-approach and failure-avoidance, Zhiyuan College has conducted systematic design in curriculum design, faculty arrangement and study environment, which would urge students to be more ambitious towards success, more fearless of failure and more concerned with collaborations.

Table1 Zhiyuan System Design

Means Goals	Pedagogical Design	Faculty Arrangement	Study Environment
Ambitious towards Success	Integrated Curricula System	International Prominent Faculty	Free Academic Environment
Fearless of Failures	Challenging Learning Tasks	Personalized Tutor System	Mutually Inspired Competitive Ambience
Concerned with Collaborations	Collaborative Learning Modality	Coordinated Teaching Instruction	Diversified Independent Study



1) Integrated Curricula System. Recruit one prominent professor to be the project director in each subject field, integrally design cultivation plan and effectively integrate curricula. Enhance introductory course so that students could acquire a full view of subject under famous professors' instruction, comprehend laws of discipline through thinking training and discover interests under curiosity. For example, converge knowledge from traditional *General Physics* to set a new course, *Introduction to Physics* so as to enable students to acquire a comprehensive study of the subject. Zhiyuan College emphasizes openness of curricular system and encourages students to select transdisciplinary courses independently based on their own study interests.



2) Challenging Learning Tasks. Demanding courses of *Mathematical Analysis*, *Linear Algebra*, and *Introduction to Physics* have been set for all the students in Zhiyuan that enable students to acquire comprehensive Mathematical and Physical knowledge, as well as gather together all the students from different majors. The rolling selection mechanism ignites students' scientific passion and challenging spirits with 22% students exit while 10% students admitted to Zhiyuan.





3) Collaborative Learning Modality. Since fresh year, students can participate in seminars combined with platform courses and students rostrum. From sophomore year, there are professional seminars instructed by prominent professors each semester. As junior students, they are encouraged to participate in various summer sessions in top universities abroad. In senior year, undergraduate thesis seminars have been set up.



4) International Prominent Faculty. The college establishes Zhiyuan professorship to recruit most outstanding professors in the world., invites prominent academic masters to give lectures and instruct in summer seminars, as well selects young faculty fellows assisting teaching so as to maintain stability and sustainability of faculty quality. Chair Professor in Zhiyuan computer science, Turing Award Winner John Hopcroft from Cornell University received the 2016 *Friendship Award* authorized by the Chinese government, which is a grand prize for foreign experts with great contributions to China.



5) Personalized Tutor System. Enhance the role of tutors that each student can obtain at least two hours to communicate with tutors weekly. Tutors can guide students' individualized development through the "one-to-one" interaction.



6) Coordinated Teaching Instruction. Change traditional teaching mode to self-preview textbooks and course videos, teacher-interpret key points and difficult points



in class, complete self-prepared/assigned homework independently or cooperatively. The new mode leads students to explore and think independently, eventually forms coordinated teaching mode of students' autonomous learning.

The faculty and teaching fellows of Zhiyuan are composed of 202 professors from related departments at Shanghai Jiao Tong University, 42 professors from other institutions in China and 82 international scholars. Till Sept., 2016, there are 1141 students enrolled in Zhiyuan College and 359 students have completed the program and graduated.

Zhiyuan has also been dedicated to cultivate students' curiosity in their early stage. In 2009, it collaborated with 11 high schools to establish "Top-notch Innovative Talents Cultivation Base" and cultivate high school students' scientific spirits via collaborative classes. Up to now, Zhiyuan College has appointed 103 teaching fellows from SJTU to participate in over 100 courses design and over 1,000 high school students involved.

7) Free Academic Environment. Except flexibility of elective courses, Zhiyuan supports students' personalized research scheme. Freshmen can comprehend research preliminarily via "Freshmen Seminars".



Relied on "Student Innovation Practice Program", sophomores carry out research exploration under mentors' instruction. Students start topics selection of undergraduate theses at their third year summer and work with graduate students from related subjects in a same lab or perform research in overseas labs.

8) Mutually Inspired Competitive Ambience. Zhiyuan students demonstrate their wisdom, intelligence and potential very well, in virtue of all kinds of platforms offered by the university and the college. They have participated in plenty of home or abroad contests and won awards or medals, such as ACM International Collegiate Programming Contest, American College Students Mathematical and Physical



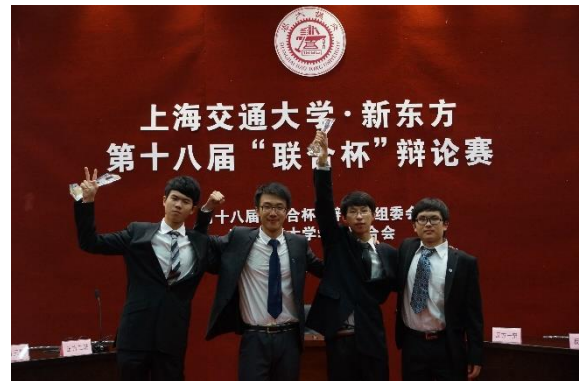
Modeling Contest, IGen and other international competitions, as well won medals in domestic level. Students' challenging spirits are improving in constant practices.



ACM team in pursuit of excellence. ACM team on behalf of Shanghai Jiao Tong University has won 4 gold medals since 2008, which inevitably linked to diligence of team members and tutors, as well as mutually inspired competitive atmosphere. After each training contest, ACM team published rankings that stressed on exchanging experience, respecting for rivals and learning from rivals.

ACM team members were requested to write brief summary regularly, so as to summarize improvements and team cooperation experience.

Eloquent debaters. As a merging force, Zhiyuan College's debate team won championship of SJTU's Campus Debate in 2013 and 2015. Debate requires long-term training of logic thinking and presentation skills. After each training, debate team would replay the contest to find bugs or defects of expression and improve constantly. Every success was a breakthrough to encourage every debater to pursue higher achievements.



9) Diversified Independent Study. On the basis of high quality classroom teaching, Zhiyuan College carries out students-oriented activities on the theme of "Learning at Zhiyuan" to arouse students' subjective initiative, encourage them to be their own "academic masters" and cultivate their scientific spirits and critical thinking.

Zhiyuan students' Colloquia. The Colloquia is a





monthly informative lecture cover a broad range of subjects carried out by Zhiyuan College's Youth League Committee. The colloquia are all presented by junior grade students, which is a stage of "Students are the Masters".

ZY-INS Colloquia.

Cooperating with the Institute of Natural Sciences, Zhiyuan College invites professors to present their research, share their scientific experience and build a communication bridge



between students and teachers. ZY-INS Colloquia enable students to get in touch with research, so as to find their research interests as soon as possible.

"Zhiyuan Inheritance" experience sharing. The session is about senior students share study experience with junior students to help them find appropriate learning methods. In addition, the experience sharing session also invites outstanding alumni to share their growing experience.



Zhiyuan club. Zhiyuan club is composed of excellent sophomores who are on duty for Q&A for junior grade students every day. The younger students can also study at the club to increase study efficiency.



One journal. *Zhiyuaner* is an academic journal covers five fundamental disciplines edited by students. Science association in Zhiyuan College's Youth League Committee established editorial department that selects and edits articles from Nature, Guokr (a science website) and also writes creative comments, which enhance their scientific accomplishments to a great extent.



One channel. Zhiyuan channel brings Zhiyuan students' Colloquia online. The instructor introduces small topics with a 15 minutes video combined collected video data, and the small topics could be related to natural sciences, arts and humanities. The videos also published on Student Union app platform, which is highly praised by students.

One platform. The ZY-INS interdisciplinary seminars held by students is designed to establish an interdisciplinary communication platform through reports of different disciplines to comprehend frontier questions and challenges in different fields, enhance students' communication and promote interdisciplinary acquisition. Many of the presenters are doctoral students and some are undergraduate students with science research achievements. Those lectures set the audience as freshmen and sophomores by omitting complicated mathematical inferences to allow them ask questions anytime that builds a dynamic academic ambience.

