Grand Challenges Scholars Program at Peking University

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Center for Water Research, College of Engineering
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The vision is to have our GCSP help ensure the GC Scholars achieve a broadened education and innovative research training to address the Grand Challenges, and to educate future engineering leaders and entrepreneurs with global perspectives and social awareness.

Among the 61 universities, PKU is the first from mainland China joining in the GCSP in October, 2017.
History of Engineering Education at PKU

Imperial University of Peking

- Established
- Renamed As Peking University

1898

Engineering Branch Established

- 1910
- 1912

Renamed As Peking University

1910-1952, 23 academicians trained

1952

Merged to Tsinghua & Tianjin Univ.

Mechanical Engineering Merged to COE

College of Engineering Reestablished

2005

Since 1952, 19 academicians have been trained

100th Anniversary of Engineering Branch

2006

2010

2020

World-class College of Engineering

100th Anniversary of Engineering Branch
Shiyi Chen
Founding Dean of COE, PKU
President of SUSTech
Academician of Chinese Academy of Sciences

Dongxiao Zhang
Current Dean of COE, PKU
Member of the U.S. National Academy of Engineering
Faculty of Sciences

Faculty of Humanities

Faculty of Information & Engineering

Faculty of Social Sciences

Health Science Center

COE and 6 Departments

- School of Information Science and Technology
- Institute of Computer Science & Technology
- College of Engineering
  - College of Environmental Sciences & Engineering
  - School of Software & Microelectronics
- Dept. of Mechanics and Engineering Science
- Dept. of Energy and Resources Engineering
- Dept. of Biomedical Engineering
- Dept. of Materials Science and Engineering
- Dept. of Aeronautics and Astronautics
- Dept. of Industrial Engineering and Management
## Facts and Figures

<table>
<thead>
<tr>
<th>Faculty</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member of Chinese Academy of Sciences</td>
<td>6</td>
</tr>
<tr>
<td>Member of Chinese Academy of Engineering</td>
<td>4</td>
</tr>
<tr>
<td>“National Thousand Talents Plan” Recipient</td>
<td>14</td>
</tr>
<tr>
<td>Cheung Kong Scholar</td>
<td>16</td>
</tr>
<tr>
<td>NSF Outstanding Young Researcher</td>
<td>25</td>
</tr>
<tr>
<td>MOE Trans-Century and New Century Talents</td>
<td>17</td>
</tr>
</tbody>
</table>

### Undergraduate Students

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>104</td>
<td>139</td>
<td>113</td>
<td>130</td>
<td>112</td>
</tr>
</tbody>
</table>

### Graduate Students

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>218</td>
<td>234</td>
<td>233</td>
<td>235</td>
<td>267</td>
</tr>
</tbody>
</table>

### Research Grants

- 2006: 13.63 million Yuan
- 2007: 24.61 million Yuan
- 2008: 56.67 million Yuan
- 2009: 69.52 million Yuan
- 2010: 106.5 million Yuan
- 2011: 164.79 million Yuan
- 2012: 203.89 million Yuan
- 2013: 202.14 million Yuan
- 2014: 228.5 million Yuan
- 2015: 316.6 million Yuan

- Million Yuan

### Graph

- X-axis: Years 2006 to 2015
- Y-axis: Research Grants in million Yuan
- Bar chart showing the trend of research grants over the years.
World-class Researches

Develop carbon sequestration methods

Make solar energy economical

Engineer the tools of scientific discovery
Engineering Education at PKU

Research/Creativity

Entrepreneurship

Global Perspective

Multidisciplinary

Service Learning/Social Awareness
## Multidisciplinary Curriculum

### Understanding multidisciplinarity of engineering systems

<table>
<thead>
<tr>
<th>Sustainability</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Ethics</td>
<td>Health Care in Traditional Chinese Medicine</td>
</tr>
<tr>
<td>Environmental Issues and Policy in China</td>
<td>Health Lifestyle &amp; Communication</td>
</tr>
<tr>
<td>Environmental Evolution and Global Change</td>
<td>Taiji and Health Preserving through Chinese</td>
</tr>
<tr>
<td>Global Environmental Issues</td>
<td>Characters</td>
</tr>
<tr>
<td>Our Changing Planet ......</td>
<td>Earth Environment and Human Society ......</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Security</th>
<th>Joy of Living</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security of Information System</td>
<td>System thinking about complexity</td>
</tr>
<tr>
<td>Cryptology and Cyber-Security</td>
<td>Introduction to Happiness</td>
</tr>
<tr>
<td>Financial Risk Management</td>
<td>Topics on Philosophy of Taoism</td>
</tr>
<tr>
<td>Global Communication and Society</td>
<td>Art and aesthetic</td>
</tr>
<tr>
<td>Science and Public Policy</td>
<td>Introduction to Music</td>
</tr>
<tr>
<td>Urban Infrastructure Planning</td>
<td>Shadowboxing</td>
</tr>
<tr>
<td>Cross-cultural Management ......</td>
<td>Introduction to Sun--Tzu`s Art of War ......</td>
</tr>
</tbody>
</table>
PKU Makers Lab 创客实践教育中心
CAPSTONE Design Program: Co-work on industry projects
Thesis research and summer research 暑期科研实践及毕业论文设计
Entrepreneurship

- Engineering World Industrial Mentors Program 工行天下导师项目
- Global Innovation and Entrepreneurship Center 全球创新创业中心
- Internship 实习
Global Study Experiences

- GLOBEX Julmester Program: over 20 universities, 350 students each year
- Global Innovation Master Project 对话全球创新大师
- I-Podium Education Cooperation Program 世界课堂
- International relations with over 30 world-class institutes, incl. MIT, Stanford, NUS, JHU, USC, GT, etc.
Service Learning

- Summer social service including tutoring activities and poverty alleviation
- Outreach

暑期社会实践
科普教育
GC Scholars Recruiting

- Application-Assessment System
- GPA above 3.0
- Application form (essay, recommendation letter)
- Interview by the GCSP Committee
- 15-25 scholars (20 on average per year)
Year 1: GCSP Seminar presents fundamental topics for understanding the GC and inspiring students

- Sustainability
- Security
- Health
- Joy of Living

Select one theme and mentor to apply → Interviewed by GCSP committee

Year 2: Working with mentors to design the 5 competencies training

- Research
- Multidisciplinary
- Entrepreneurship
- Global Perspective
- Social Consciousness

Select 1-2 components for in-depth explore → 1st Evaluation by GCSP committee

Year 3: Focus on the 1-2 competencies for high-intensity development

- Component 1
- Component 2

2nd Evaluation by GCSP committee

Year 4: Focus on the 1-2 competencies for high-intensity development, graduation
• Vision of GCSP section: paragraphs describing the school in general, and the ecosystem of the engineering education in particular.

• Program Components section: The activities cannot double-count.

• GC Scholars Recruiting, Mentoring and Evaluation section: the detailed selection criteria for scholar applicants. Appendix needed to illustrate the module of the Application and the Evaluation Forms.

• GCSP Administration section: to elaborate how the GC Director be selected, and the composition of the GCSP Steering Committee, possible funding sources. Use Appendix to list the proposed members of the GCSP Steering Committee.
Challenges & Solutions

• Need to be tested in practice
• How to integrate GCSP with existing activities
• How to secure financial support to GCSP mentors, scholars and relevant activities
  – Closely work with industrial partners
  – Apply for governmental support for innovative engineering education
• Inspire/motivate scholars/mentors and monitor students’ progress
  – Organize relevant competitions and workshops
  – Communicate with GCSP scholars from other schools/countries
  – Credits to mentors
For more details, visit our website:
http://en.coe.pku.edu.cn/gcsp/index.htm

Thank you!