Proposal to establish a
Grand Challenge Scholars Program at

Peking University

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Introduction

The National Academy of Engineering (NAE) has identified 14 Grand Challenges for Engineering and called for a new engineering education paradigm – the Grand Challenges Scholars Program (GCSP) to prepare engineers to address those challenges and change the world. The GCSP has now been implemented at 49 engineering schools around the world, with over 120 more schools planning to join this initiative. Among the joined schools, only 3 are from Asia and Pacific region (City University of Hong Kong, National University of Singapore, and Taylor's University, Malaysia). So far there are no universities from mainland China joining in the GCSP.

As one of the top universities in China, Peking University (PKU) is pleased to submit this proposal to establish a Grand Challenge Scholars Program at PKU. This will be the first university from mainland China joining in GCSP, which is essential not only for promoting the engineering education at PKU, but also for mentoring other institutions overseas interested in developing the GCSP in the future.

In accordance with the NAE GCSP "Operational Document for Proposing a GCSP at Your School", this document describes **PKU's vision for its GCSP, how the five GCSP components will be met, how the GC Scholars will be recruited, mentored and assessed, how the GC Director and faculty mentors will be selected and their specific roles and responsibilities, how PKU will secure the funding and support for GCSP, and the unique aspects of GCSP at PKU.**

PKU's Vision for a GCSP

Peking University

Established in 1898, Peking University is a comprehensive and national key university in China. The campus, known as "Yan Yuan" (the garden of Yan), is situated at Haidian District in the western suburb of Beijing, with a total area of 2,743,532 square meters (274 hectares). It stands near to the Yuanmingyuan Garden and the Summer Palace. Peking University is proud of its outstanding faculty, including 53 members of the Chinese Academy of Sciences, 7 members of the Chinese Academy of Engineering, and 14 members of the Third World Academy of Sciences.

The university has effectively combined research on important scientific subjects with the training of personnel with a high level of specialized knowledge and professional skill as demanded by the country's modernization. It strives not only for improvements in teaching and research work, but also for the promotion of interaction and mutual promotion among various disciplines. It has become a center for teaching and research and a university of a new type, embracing diverse branched of learning such as basic and applied sciences, social sciences and the humanities, and sciences of medicine, management, and education. Over the past few years, Peking University has been actively pursuing its goal of becoming a world-class university.

To fulfill such an aspiration, PKU has committed itself to developing cutting-edge technologies, promoting innovation in its students, providing opportunities for young leaders to emerge, and encouraging higher academic standards. Building a leading engineering program is one of the crucial strategies of PKU's route in becoming an internationally renowned university.

College of Engineering, PKU

In 2005, PKU reestablished the College of Engineering (COE). From its inception, the College has sought to be a top-tier engineering institution. By drawing upon PKU's vast resources in fundamental research and extensive studies, the College of Engineering has successfully created a program that promotes interdisciplinary research. COE includes 120 faculty and teaching and research staff who are renowned both at home and abroad in their individual fields. Most of the faculty has overseas experience, working or studying in leading universities prior to joining in the College of Engineering. They are conducting cutting-edge research in fields ranging from physical sciences and medicine to public health and industrial management.

It is the hope of COE that the students are able to take different approaches in the pursuit of progress and development if provided with a broad spectrum of knowledge. The students are encouraged to be innovative in future engineering and technology exploration for the prospect of national socio-economic development, and are trained to become future leaders and entrepreneurs.

The missions of the COE include: 1. Provide the best educational environment for students to reach their full potential in the study of engineering science and as individuals; 2. Become a world-class research center that is devoted to the discovery and application of new knowledge in engineering and science; 3. Become a national base of engineering research and education, a center of future technology, a driving force for national economic growth, and a cradle for educating future engineering leaders and entrepreneurs.

Vision for a GCSP at PKU

We share the same objective with the NAE's GCSP, which is to educate the future leaders of the Grand Challenges of Engineering. The College of Engineering at PKU already offers strong opportunities for pursuing each of the required GCSP elements. The GCSP will provide our students with the broad education and global perspectives they need, and motivate them to increase their academic engagement and innovation ability throughout their years at PKU.

Our **vision** is to have our GCSP help ensure the GC Scholars achieve the broadened education and innovative research training addressing the Grand Challenges, and to have our GCSP become a cradle for educating future engineering leaders and entrepreneurs with global perspectives and social awareness.

PKU expects its GC Scholars to be able to recognize and act on their ability to make real efforts towards solving the world's Grand Challenges. GC Scholars will create

innovative ideas that will solve the most pressing issues of today to meet the basic needs of all people and work for a higher standard of living. PKU expects them to understand that it takes people from various disciplines to solve these problems, which must be considered from different angles. They will work to build their entrepreneurial skills, which will allow them to take their ideas into the business world. Furthermore, GC Scholars will realize both that they work in a global environment and that they work to sever the public and improve the general welfare of all human being.

Program Components

This section of the operational document describes how the GCSP at PKU will fulfill the **five major components** of the program. Acceptable activities for complementing these components are summarized in Appendix 1. The activities in which the GC scholars engage to satisfy each of the five components of the program should be focused on one or more of the grand challenges, which follow under four cross-cutting themes: SUSTAINABILITY, HEALTH, SECURITY and JOY OF LIVING. The following subsections list the activities under each of the five major components, from which the Scholars can choose to satisfy the requirements for one of those components, but the activities cannot be double-counted.

Research Experience or Hands-On Project

All GC Scholars will be required to participate in a substantial team or independent project relating to a Grand Challenge theme or specific Grand Challenge problem. The extended research project (two semesters minimum) gives scholars the chance to deeply address the identified challenge under the guidance of a faculty member. This component can be fulfilled in a research laboratory, off-campus in industries, or in one of the making and fabrication spaces on campus. PKU already has the culture and infrastructure to support this kind of activities, and fits in the GCSP research theme. Projects/Research platforms and options include:

1. **PKU Makers Lab:** An open platform that provides hands-on practice venues, hardware and software skills training, innovation and entrepreneurship courses and resource docking services for students and scholars. From the cultivation of innovative and entrepreneurial talents, to provide innovative business space and consultations to the entrepreneurial team, from providing innovative entrepreneurial tutors, to raise funds for innovation and entrepreneurship, PKU Makers Lab provides the whole industry chain support, so that real innovators and entrepreneur can succeed.
2. **CAPSTONE Design Program**: The engineering design projects involved are directly connected with the industry customers. The program encourages students to give full play to the spirit of self-innovation, and is closely linked with the discipline, students can freely choose to design topics, the entire project students not only accept the technical guidance of enterprises, but also accept the cooperation of teachers guidance; Both to meet the engineering theory standards, but also to meet the needs of enterprises.

3. Two semesters or more **thesis research** in an approved PKU and/or industry laboratory, and an approved intensive **summer research** project. This gives the scholar the chance to deeply address the identified challenge under the guidance of a faculty member. This component can be fulfilled in a research laboratory, off-campus in an industrial laboratory, or in one of the making and fabrication spaces on campus.

Interdisciplinary Curriculum

The interdisciplinary curriculum will prepare GC Scholars to face up the complex Grand Challenges and understand that technical solutions never occur in isolation, but rather must be informed by ethics, law, human behavior, policy, risk assessment and business etc.

1. **The Grand Challenges seminar:** One-semester GCSP seminar organized by GCSP Director and jointly given by COE faculty members or invited speakers related to the Grand Challenges in engineering. GCSP scholars are required to take this seminar course in their first academic year to know more about GCSP program and to get ready for the formal application in the end of their first year.
2. **Existing courses** at PKU relate to the 14 Grand Challenges and fulfil the interdisciplinary exploration (relevant courses are listed in Appendix 2). Those course are chosen from all relevant departments at PKU and are fitful for one of the four major schemes identified by NAE: Sustainability, Health, Security, and Joy of Living. Those courses can prepare GC scholars with the required knowledge and skills to address one or more of the 14 Grand Challenges.

Entrepreneurship

PKU GC Scholars will be required to complete some forms of entrepreneurship activities. It is important for them to understand the way business functions in the world and the processes of commercializing new technologies. PKU has already launched series of relevant entrepreneurial activities which fit well with the GCSP's requirement. Those include:

1**. Engineering World Industrial Mentors Program**: The Engineering World Industrial Mentors Program is initiated and implemented by the Alumni Association and the Office of Development at COE, PKU. The well-known alumni, managers, senior experts and/or scholars of government, industry and research institutions are invited to serve as mentors for students. Both the first responsible mentor at COE and the industry mentor will guide the students in a "Dual Mentor" system. Through business visits, field research, project participation, salon and other ways, invited mentors share their professional experience and encourage and lead students' career development.

2. **Global Innovation and Entrepreneurship Center**: Created by PKU with 4000 m^2 area in total, among which 800 m^2 are assigned to COE for innovative and entrepreneurial activities in engineering. Students can take full advantage of the space and facilities to conduct innovative research and entrepreneurial activities at this platform.

3. Securing an **internship** or other experience that explicitly involves innovation, invention or related activity. Students can use summer time to do internship in relevant industries.

Global Perspective

A global perspective is essential to address the grand challenges that are inherently global and have the potential to lead to innovation in a global economy. GC Scholars at PKU will be required to complete a global awareness activity in order to understand the global aspects of the problem they are trying to solve and the contextual challenges to implementing solutions. Acceptable activities will include:

1**. Global Innovation Master Project**: The project will invite industry leaders from different countries to give series of lectures to students showing the innovative wisdom. The lectures include design, fashion, humanities, art, science and technology and other topic closely related to life. Inspire students think about "innovation" and guide students to discover and explore the "innovative" way of thinking and the law of action that suits each person.

2. **GLOBEX** – The Globex Julmester (which means **glo**bal **ex**change program at **Jul**y se**mester**) at PKU is a professional mobility program with a worldwide exchange of students from all disciplines of study. To enhance student's global and professional experience, Globex offers courses that focus on the core elements of engineering & science, engineering finance & entrepreneurship, and society & globalization.

3. **Cross-Cultural Design Project** collaborated with Stanford University to improve understanding and facilitate better relations between two distinct cultures.

4. **Joint scholar program with Georgia Institute of Technology and Emory University** on biomedical engineering. This partnership provides the opportunity to create a new paradigm for global biomedical engineering education and research. Georgia Institute of Technology has also joined in the Grand Challenge Scholars Program. Students apply to the program through the school designated as the home campus, either the Department of Biomedical Engineering at PKU in Beijing or the Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory in Atlanta. Students will have an advisor at the home campus and co-advisor at the secondary campus.

5. **The i-PodiumTM Education Cooperation Program**. COE has collaborated with University of Southern California and established i-Podium facilities so that students can take classes via video cameras, which foster interaction to bridge the gap between China and other nations.

Service Learning

Beyond the campus are many communities and organizations where the talents and skills of the GC Scholars can be used in a meaningful and useful way. Such activities serve to develop a social consciousness while bringing technical expertise to bear on societal problems. All GC Scholars will be required to complete a service learning to ensure they understand their responsibility to the public as an engineer and as a citizen, as well as to better understand the contextual challenges associated with implementing technical solutions. They can choose from the following:

1. **Summer social service** including tutoring activities (elementary, middle and

high school) and poverty alleviation. Collaborated with the Love Community of PKU, COE has built up regular summer social services including tutoring and poverty alleviation activities in several remote and poor areas in China. Students can select one of the locations and go there to tutor elementary, middle and high schools for 1-2 weeks, and conduct social survey and investigation such as the feasibility of sharing PKU education resource with the supported areas through network platform.
2. **Science education service** includes designing courses related to grand challenges and offering the courses to publics especially primary and middle school students for them to better understand science and technologies.

GC Scholars Recruiting, Mentoring and Evaluation

The GCSP program would be open to all undergraduate engineering students. The Scholars will be recruited through an **Application-Assessment System**. Incoming engineering students will receive a brochure in their course registration package that describes the GCSP. Interested students can register for the GCSP Grand Challenges seminar to know more about this program and to get ready for the formal application in the end of their first year. Students with a **GPA above 3.0** in the end of the first year are qualified to submit the application for GCSP. Each applicant will be required to submit a completed **application form** that will indicate their courses taken and grades received, their interests in the Grand Challenges, and which theme they would like to address. A module of the application is attached as Appendix 3. The GC Scholars are to commit to one more of the Grand Challenges and focus on those challenges(s) throughout their program. The selection criteria for scholar applicants will be according to the demonstrated passions for one or more Grand Challenges in the application, and the overall performance of the applicants during **the interview.** A score will be given to each applicant by the GCSP committee members during the interview, and the selection will be according to the score level. It is expected that **15-25 scholars (20 on average per year)** will be recruited each year from the engineering students that have finished their first year studies at the College of Engineering.

GC Scholars will be required to choose a mentor in the mentor list (Appendix 3) suggested by the GCSP Committee when they submit the application form. The Scholars will work with their mentors to select their GC courses, research topic, and the appropriate activities to fulfill the requirements of the 5 components for addressing their interested GC. The mentor will also be responsible for evaluating the Scholars' research performance in conjunction with the Steering Committee.

GC Scholars will be comprehensively evaluated by the GCSP Committee in their third and fourth year at PKU based on their overall performances in the five major components. A module of the evaluation form is attached as Appendix 4. The Scholars will be required to give a presentation to the GCSP Committee, indicating their completion of the five components and how the Grand Challenge(s) they chose are

addressed. GCSP Certificate will be issued to the qualified Scholars in the graduation ceremony.

GCSP Administration

The GCSP administration team at PKU will include **the GC Director, an Associate Dean of COE, chairs of the six engineering departments, and GC Mentors, which compose the GCSP Steering Committee.** The Director will administer, oversee and assess the GCSP in conjunction with the Steering Committee, therefore a specific faculty member will be needed to be fully responsible for this. The requirements for the GC Director include: 1. Excellent organization and communication skills. The various activities under the 5 components of GCSP to address 14 Grand Challenges requires extensive organization, management and communication to guarantee the program running smoothly. 2. Interdisciplinary background, so that the Director can oversee the design of the program and ensure the comprehensive coverage of the GCSP. 3. Oversea background. The Director should have oversea studying or working background, so that he/she can have an international perspective to ensure the GCSP global component. 4. Good personality. The Director should be someone easy going and dedicate to the program, to guarantee the five components of GCSP be well implemented. Dr. Jie Liu will act as the GCSP Director at COE, PKU, under the direct supervision of the Dean of Engineering (Dr. Dongxiao Zhang), and an Associate Dean of Engineering (Dr. Yongmei Li) who is in charge of the innovative education and entrepreneurship of COE. Dr. Liu got her Ph.D. from the United States and works on environmental and hydrologic sciences. By its very nature, environmental and hydrologic sciences stand at the interdisciplinary interface with many other disciplines, and this background offers Dr. Liu a good foundation to work on the GCSP program design to ensure its comprehensive coverage. The oversea studying experience prepares Dr. Liu for easily communicating with the GCSP Network Director and the Directors from other universities within the network. Dr. Liu obtained Excellence Teaching Award from PKU and got highly rated teaching evaluation from students. She will work full-time on the GCSP and be the key person to administer, oversee and assess the program in conjunction with the Steering Committee at PKU.

The faculty mentors will come from the six departments of COE, whose research fields are related to the four themes (sustainability, health, security and joy of living) addressing the 14 Grand Challenges. As part of their normal educational/service duties the mentors do not receive extra financial remuneration for the GCSP role. They participate in the Scholars selection process, help to link individual GC Scholars with research opportunities within their departments or within interdisciplinary groups with whom they collaborate, and help to advise Scholars on course selection and on how to complete the five components of the GCSP program.

The Steering Committee will advise the GCSP Director on strategy and operational issues to facilitate continuous improvement, oversee the Scholars selection process,

liaise with faculty and staff on GCSP matters as needed, and suggest new topics and skills to be included in the GCSP program. The proposed members of the Steering Committee are listed in Appendix 5.

Resource Plan

PKU has already secured the resources needed to launch and maintain the GCSP. The donation from **Cen Science Innovation and Practice Education Fund (5million Yuan), Baoding TongFang Wisdom Valley Innovation Fund (1.5million Yuan), and PKU International Talents Fund (10 million Yuan)** have been indicated for the purpose of innovative activities and international exchanges addressing the grand challenges in engineering, which fits well for the objectives of the GCSP.

The financial support will mainly be used for GCSP related activities, including the costs for GCSP lectures, researches, travels and all the other costs. It is expected that once the GCSP is fully launched at PKU, it will attract exceptionally strong students. 5 Scholarships will be offered to the top Scholars based on their mid-term evaluation in the end of their second year.

Other resources will come from the cooperative entities which can provide direct support to the innovative and entrepreneurial activities under the GCSP.

Uniqueness

Different from the traditional engineering, the engineering at PKU is focusing on future engineering and new technology. Most of the faculty has **overseas experience**, working or studying in leading universities prior to joining in the COE. They are conducting **cutting-edge research** in fields ranging from physical sciences and medicine to public health and industrial management, which offers **the global perspective** and a **wide variety** in addressing the Grand Challenges of Engineering in the 21st century. The on-going programs, such as GLOBEX, CAPSTONE design, IPODIUM, Global Innovation and Entrepreneurship Management and Summer Social Service program, all fit for the five major components required by GCSP and provide a solid foundation for implementing GCSP at PKU. In addition, the GCSP at PKU will be **the first program launched in China**. China is experiencing fast economic development with increasing population, which brings unprecedented challenges for engineering. To address the complex Grand Challenges in China will provide valuable experiences for other countries, and the GCSP at PKU will also provide example and experience for expanding it to more universities in China and other Asian countries.

Appendix 1

Summary of the Grand Challenges Scholars Program's required components and options for completing them

Components	Requirements
Research Experience/ Hands-on Project	Complete an independent research project over a summer or one or more semesters, through ONE of the following ways: 1. PKU Makers Lab 2. CAPSTONE Design Program 3. Thesis research and summer research
Interdisciplinary Curriculum	Complete EACH of the following: 1. The Grand Challenges seminar 2. An Approved set of courses related to Grand Challenges and fulfil the interdisciplinary exploration (Appendix 2)
Entrepreneurship	Completing entrepreneur activities through ONE of the following platforms: 1. Engineering World Industrial Mentors Program 2. Global Innovation and Entrepreneurship Center 3. Internship
Global Perspective	Completing ONE of the following activities: 1. Global Innovation Master Project 2. GLOBEX 3. Cross-Cultural Design Project collaborated with Stanford University 4. Joint program with Georgia Institute of Technology and Emory University on biomedical engineering 5. I-Podium Education Cooperation Program
Service Learning	Completing ONE of the following activities: 1. Summer social service including tutoring activities and poverty alleviation 2. Science Education Service

Appendix 2

Existing courses at Peking University related to one or more Grand Challenges

Sustainability	00331781 现代工学通论 Introduction to Modern Engineering (including Engineering Ethics) 01430960 自然资源概论 Introduction to Natural Resources 01534230 自然保护学 Nature Conservation 01536850 环境地学 Environmental Geosciences 01235290 环境与生态科学 Environmental and Ecological Sciences 12731060 环境伦理学 Environmental Ethics 02330500 环境哲学 Philosophy of Environment 06235040 资源与环境经济学 Resources and Environmental Economics 21100012 自然资源政策的经济分析 Economic Analysis of Natural Resource Policy 21100013 水资源稀缺经济和政策分析 Water Scarcity Economy and Policy Analysis 12730080 中国环境问题与环境政策 Environmental Issues and Policy in China 01531810 环境演变与全球变化 Environmental Evolution and Global Change 12731020: 全球环境问题 Global Environmental Issues 12730020: 变化中的星球 Our Changing Planet 06233650 全球化与中国经济成长 Globalization and China's Economic Growth 02534560 世界经济与中国 World Economy and China
Health	0033***** 健康系统工程 Health System Engineering (in planning) 04831320 脑与认知科学 Brain and Cognitive Science 18050200 中医养生学 Health Care in Traditional Chinese Medicine 89339770 健康的生活方式与健康传播 Health Lifestyle & Communication 01630709 大学生心理健康 Mental Health for College Students 04130630 汉字太极与养生课 Taiji and Health Preserving through Chinese Characters 03033610 大众健康信息资源与利用 Public Health Information Resources and Utilization 01630081 健康人格心理学 Healthy Personality Psychology 06239040 宏观经济与健康 Macroeconomic and Health 06238060 健康经济学 Health Economics 03033600 健康信息学概论 Introduction to Health Informatics 89530055 生命伦理学 Bioethics 02830140 社会心理学 Social Psychology 01430950 地球环境与人类社会 Earth Environment and Human Society 12731010 人类生存发展与环境保护 Human Subsistence & Development and Environmental Protection

Security	00331480: 系统与控制引论 Introduction to Systems and Control 01231450 灾害地质学 Disaster Geology 01532350 城市基础设施规划 Urban Infrastructure Planning 01235350 地理信息系统概论 Introduction to Geographic Information Systems 02930941 环境法概论 Introduction to Environmental Law 03033710 计算机网络概论 Basics of Computer Networks 03033110 信息安全 Security of Information System 04833170 密码学与网络空间安全 Cryptology and Cyber-Security 04830410 信息安全引论 Introduction to Information Security 04831220 智能科学技术导论 Introduction to Intelligent Science and Technology 02831680 金融风险与管理 Financial Risk Management 01800210 全球传播与社会 Global Communication and Society 02319560 科学与公共政策 Science and Public Policy 02833100 跨文化管理 Cross-cultural Management
Joy of Living	00332320: 工程设计 An Introduction to Engineering Design 00334030 工学创新实践 Engineering Innovation 08619104 创新创业管理 Innovation and Entrepreneurial Management 00333400 对话全球创新大师 Dialogue with Global Innovation Masters 00333890 面向复杂性的系统思维 System thinking about complexity 04831270 智能信息系统 Intelligent Information System 04831280 可视化与可视计算概论 Visualization and Visual Computing 01635020 生活中的心理学 Psychology in the Normal Life 03131420 幸福导论 Introduction to Happiness 20810006 中国的伦理与价值 China's Ethics and Value 03033243 中国名著导读 Masterpieces of Chinese Literature 02332074 道家哲学专题 Topics on Philosophy of Taoism 02330000 哲学导论 Introduction to Philosophy 04330688 艺术与审美 Art and aesthetic 04330005 音乐概论 Introduction to Music 04130030 太极拳 Shadowboxing 60730330 孙子兵法导读 Introduction to Sun--Tzu`s Art of War 04333021 美术概论 Introduction to Fine Arts 02335330 世界文明中的科学技术 Science & Technology in World Civilizations 06216280 全球视野中的领导力 Leadership in a Goble Perspective 00333117 跨文化设计：对生态负责的商业模型 Cross-cultural Design: Ecologically Responsible Business Model

Appendix 3

The GCSP Application Form
Application for the PKU Grand Challenge Scholars Program

Please fill in the below form for your application for the PKU Grand Challenge Scholars Program. When you have completed this application, please send the **form** as well as your application **essay** and one **recommendation letter** to jie.liu@pku.edu.cn .

Name: _____
Email: _____
Phone: _____
Anticipated graduation year: _____

Which Grand Challenges(s) most interest you? Please put a number next to the GC that you think you might be interested in. Number 1 indicates the most interested one, and 2 as the next favorite and so on. More information about the Grand Challenge can be found through this link.

__ Advance personalized learning
__ Make solar energy economical
__ Enhance virtual reality
__ Reverse-engineer the brain
__ Engineer better medicines
__ Advance health informatics
__ Restore and improve urban infrastructure
__ Secure cyberspace
__ Provide access to clean water
__ Provide energy from fusion
__ Prevent nuclear terror
__ Manage the nitrogen cycle
__ Develop carbon sequestration methods
__ Engineer the tools of scientific discovery

If you have identified members of the GCSP Steering Committee who you would like to serve on your subcommittee, please place a check next to their names.

__ Xidong Wang, Professor of Department of Energy and Resources Engineering
__ Leyuan Shi, Professor of Department of Industrial Engineering and Management
__ Huiling Duan, Professor of Department of Mechanics and Engineering Science
__ Qiushi Ren, Professor of Department of Biomedical Engineering
__ Anyuan Cao, Professor of Department of Materials Science and Engineering
__ Cunbiao Li, Professor of Department of Aeronautics and Astronautics

Please help us get to know you and understand your motivations for becoming a Grand Challenge Scholar by writing **one essay**. Please discuss in 1000-1500 words why you wish to become a Grand Challenge Scholar, which theme(s) and challenge (s) you are interested in most and why, what you would bring to the GCSP.

Please provide **one recommendation letter** from your academic adviser.

Appendix 4

The GCSP Evaluation Form

Five Components	Completion of the Requirements	Evaluation (grade from 1 to 5, worst to best)
Research Experience/ Hands-on Project	__ PKU Makers Lab __ CAPSTONE Design Program __ Thesis research and summer research	
Interdisciplinary Curriculum	__ The Grand Challenges seminar __ An Approved set of courses related to Grand Challenges and fulfil the interdisciplinary exploration	
Entrepreneurship	__ Engineering World Industrial Mentors Program __Global Innovation and Entrepreneurship Center __ Internship	
Global Perspective	__ Global Innovation Master Project __ GLOBEX __ Cross-Cultural Design Project collaborated with Stanford University __ Joint program with Georgia Institute of Technology and Emory University on biomedical engineering __ I-Podium Education Cooperation Program	
Service Learning	__ Summer social service including tutoring activities and poverty alleviation __ Science Education Service	

How the Grand Challenge(s) has been addressed?

14 Grand Challenges	Evaluations (grade from 1 to 5, worst to best)
Advance personalized learning	
Make solar energy economical	
Enhance virtual reality	
Reverse-engineer the brain	
Engineer better medicines	
Advance health informatics	
Restore and improve urban infrastructure	
Secure cyberspace	
Provide access to clean water	
Provide energy from fusion	
Prevent nuclear terror	
Manage the nitrogen cycle	
Develop carbon sequestration methods Engineer the tools of scientific discovery	

Appendix 5

Members of the GCSP Steering Committee at PKU

GCSP Steering Committee	Name	Email
Dean of COE	Dongxiao Zhang	dxz@pku.edu.cn
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GCSP faculty members		
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