

Grand Challenge Scholars Program

Operational Document

Background

The Grand Challenge Scholars Program is endorsed by the **National Academy of Engineering (NAE)** to **prepare students** to be the generation that solves the **grand challenges** facing society in this century.

14 Grand Challenges

1. Make solar energy economical
2. Provide energy from fusion
3. Develop carbon sequestration methods
4. Manage the nitrogen cycle
5. Provide access to clean water
6. Restore and improve urban infrastructure
7. Advance health informatics

14 Grand Challenges

8. Engineer better medicines
9. Reverse-engineer the brain
10. Prevent nuclear terror
11. Secure cyberspace
12. Enhance virtual reality
13. Advance personalised learning
14. Engineer the tools of scientific discovery

GCSP@NUS

- To create a community of future-ready engineers
- To foster interdisciplinary opportunities
- To engage in projects that can benefit society

- A personal letter from the President of NAE
- Recognition from NUS
- Self-testimony of contribution and capability...

Program Requirements

- **Curricular components :**
 - i. Grand Challenge Project
 - ii. Interdisciplinary experience
 - iii. Entrepreneurial experience
 - iv. Global awareness
 - v. Service learning
- **GCSP Portfolio**
- **GCSP Community at NUS**

Curricular components

i. Grand Challenge Project

- To be carried out in EG3301R
 - Achieve a grade of B+ or above
 - Else, supplement with EG4301 or EG2605 or EG2606B or equivalent

Curricular components

ii. Interdisciplinary experience

- Interdisciplinary coursework through EG2301 or EG2311
 - Achieve a grade of B+ or above
 - Else, supplement with additional modules (e.g. EG2201A)
- Or, carry out interdisciplinary fieldwork
 - To be advised by the GCSP mentor
 - e.g. Documentation of interdisciplinary contributions

Curricular components

iii. Entrepreneurial experience

- Conduct a fundraising exercise (choose one)
 - Related to GCSP activities
 - Related to the GC theme addressed
- Or, compete in a business competition
- Or, submit a business plan to investors or funding agencies
- Or, set up and run a new venture

Curricular components

iv. Global awareness

- **If based overseas** (choose one)
 - SEP
 - NOC
 - STEER/Overseas camp/conference/attachment
- **If based locally** (choose one)
 - Endorsement from overseas collaborators
 - International summer programme
 - Or equivalent

Curricular components

v. Service learning

- Endorsement from (choose one)
 - Community leaders (e.g. Grassroots leaders)
 - Service or public organisations (e.g. EngineeringGood, outreach to schools)
- Or, service towards the GCSP/NUS community
 - Participate in the Undergraduate Leadership Opportunities Program with iDCP
 - Or, serve as a Peer Leader (tutor) with iDCP
 - Expected service: at least 40 hours

GCSP Portfolio

The portfolio contains accounts of the work done for each curricular component.

- Personal reflection of the GCSP journey
- Interconnectedness of the work done
- Supplementary (e.g. video, blog, etc.)

GCSP Community

Support and mentor fellow scholars in GCSP.

- Leadership role in GCSP activities
- Inspiring junior students to join GCSP
- Outreach to other GCSP institutes and local pre-tertiary schools

Progress Guide

	Starting	Emerging	Proficient	Exceptional
Curricular Components & Portfolio* 1. Project 2. Interdisciplinary 3. Entrepreneurial 4. Global 5. Service	The component is barely addressed.	The component is somewhat addressed but the relevant portfolio write-up is incomplete or lacks clarity.	The component is addressed with some minor aspects missing. The relevant portfolio write-up is coherent and is linked to the GC theme addressed.	The component is fully addressed in depth. The relevant portfolio write-up is coherent and shows evidence that the work done has contributed to the GC theme addressed.
Service to the GCSP community	No participation documented	Low level of participation documented	Active throughout the semesters at GCSP	Active throughout the semesters at GCSP, with leadership role for at least one semester

*Progress will be reviewed for each curricular component.

Candidates need to be exceptional in at least 2 areas and proficient for the rest to complete GCSP.

Timeline

Year 2	Semester 1	<ul style="list-style-type: none">• Induction to GCSP
	Semester 2	<ul style="list-style-type: none">• Commence EG3301R• Progress review 1
Year 3	Semester 1	<ul style="list-style-type: none">• Continue with EG3301R• Progress review 2• Portfolio draft submission A
	Semester 2	<ul style="list-style-type: none">• Progress review 3
Year 4	Semester 1	<ul style="list-style-type: none">• Progress review 4• Portfolio draft submission B
	Semester 2	<ul style="list-style-type: none">• GCSP Presentation• Submit final portfolio*• Final review

*The final portfolio is a compilation and an update of the earlier submissions.

Contact Us

Dr Edwin Koh

Engineering Design and Innovation Centre
Faculty of Engineering
Block E2A #04-05
5 Engineering Drive 2
Singapore 117576

Tel: 6601 1657

Email: edwin.koh@nus.edu.sg