SUTD CAPSTONE PROGRAMME

The Capstone project crystallises various learnings of a student and gives them a cumulative mastery of all their experiences at SUTD.

SUTD is set up to develop technically-grounded leaders and innovators who will contribute to improving the world. Believing that society is in need of technology-based services, products and systems, SUTD broke from tradition to provide students with a multi-disciplinary curriculum delivered via a hands-on, collaborative learning pedagogy and environment. A key part of this philosophy is the Capstone project.

The Capstone project brings together students from different pillars to work in design teams, contributing their respective expertise and skills to solve real-world challenges. It also provides them with a realistic design situation where projects usually span multiple disciplines and require team-based efforts to create a solution.

SUTD would like to invite you to join us as Capstone Partners to provide real-world projects that challenge our students to think, innovate and develop solutions that will change the world.

INDUSTRY-BASED CAPSTONE PROJECT

A Capstone project is an industry-based project which gives senior year undergraduate students the opportunity to practically apply the knowledge, principles, concepts and techniques they have learned to solve real-world, multi-discipline challenges. It aims to give students a holistic, integrative design experience that requires an extensive range of technological design skills and knowledge such as:

- Identifying needs
- Transforming needs into technical specifications or design strategies
- Applying modelling techniques and evaluating design alternatives
- Working as a team to resolve challenges in designing and producing a solution
- Validating solutions to meet specifications and needs

CAPSTONE PROJECT PHASE

Students will work on the project mainly on-campus with SUTD faculty as instructors and Capstone Partners as mentors during the period January to August. It is a two-term integrated design experience in the senior year. The faculty instructors and mentors will jointly supervise and guide the project team to fulfill the project scope and deliverables. At the end of the project period, a final report will be produced and shared with Capstone Partners.
EXPLORING THE DESIGN OF FUTURE SENIOR CARE CENTRES

Senior Care Centres (SCCs) are one-stop integrated centres providing both social and healthcare services to care for a wide spectrum of community-dwelling seniors. SCCs support seniors with multiple care needs who prefer to age in a familiar environment. SCCs have to be designed such that they are elder-friendly environments where seniors can safely engage in activities to keep them mentally and physically healthy. Hence, providing them with a comfortable environment resembling their homes. For the Capstone project, students from the different pillars worked together to design an adaptive SCC that could be configured to suit the different needs and environments (e.g. void deck, community centre, carpark). The design articulated the physical infrastructure needed as well as introduced innovations in spatial design and assistive technology to optimise the delivery of eldercare.

“"It has been an enriching experience working with a group of dedicated students who are passionate about social causes - designing a comfortable, engaging & secure environment for our clients.”

Ms Melisenda Tan
Senior Executive
Care Integration Division
Agency for Integrated Care

MALICIOUS ACTIVITIES DETECTION

With the increasing need for security, financial institutions require web-based software that can identify malicious activities within an enormous volume of system event logs. Currently, the detection is done by random sampling which is time consuming and requires intensive manpower. Applying their knowledge of programming and data analytics, the Capstone team developed a prototype that is able to analyse change requests and system logs to identify cases that are potentially suspicious for further action.

“"A solution that has the ability to identify potential unauthorised system changes based on machine learning and data analytics.”

Mr Chua Han Guan
Senior Vice President
DBS Bank

In collaboration with Agency for Integrated Care

In collaboration with DBS
AUTOMATION OF OUTPATIENT PHARMACY

In collaboration with Changi General Hospital

Changi General Hospital (CGH) is expanding its facilities to meet the increasing demand of specialist outpatient care services. One of its initiatives is to optimise workflows and improve medication safety by designing an Outpatient Pharmacy Automated System (OPAS). Working together in a cross-discipline team, ESD and ISTD students focused on optimising the throughput of the delivery system used for dispensing drugs while EPD students developed the system used to consolidate, buffer and deliver drug prescriptions. ASD students studied the optimal space arrangement of the outpatient pharmacy and how the equipment could be best arranged in the given space. Eventually, with their combined team knowledge and skills, the Capstone team designed an optimal pharmacy layout incorporating systems and technologies that proved capable of catering to the high operational throughput.

DE-FROST

In collaboration with Samsung

The busy lifestyle of urban solo dwellers calls for solutions to reduce food wastage as food is usually purchased and stored on a weekly basis. Utilising their design skills, the students developed a green table-top storage device to store fresh food for a week without the use of refrigeration. For the convenience of users during grocery shopping, a complementary mobile application was also developed to track food items and provide recipe suggestions based on the food items stored in the device. A series of iterative prototyping was conducted by the team. First, the Capstone team determined the shape of the device and selected the materials to fabricate the functional prototype. Then, students tested two types of vacuum pumps and carried out various experiments to optimise the UV and vacuum conditions that can help keep food fresh. Finally a functional prototype was developed as proof-of-concept.

“With SUTD students working closely with us to transform our future pharmacy, useful models and interesting insights were developed that enriched the project. CGH is pleased to be a partner of SUTD’s Capstone Programme.”

Ms Selina Seah
Assistant CEO
Changi General Hospital

“These talented young minds from SUTD have proven that creativity and innovation are not measured by the duration of the time spent or the years of experience that one attains. Passion is all that it takes.”

Ms Jane Tang
Assistant Manager
Product Innovation Team
Samsung Asia Pte Ltd
CONTRIBUTIONS FROM CAPSTONE PARTNER

Capstone Partners should provide:

- Projects that involve students from at least 2 different pillars
- Projects that have enough scope for 5-7 students per team
- Projects that last 2 terms (from January to August)
- Projects that fulfill university learning objectives
- Mentors who will work closely with students and faculty instructors
- The project sum is $6,500 per team to cover design, prototype and project materials. If the proposal is submitted by 31 August, the cost of participation is $6,000

VALUE TO CAPSTONE PARTNER

Capstone Partners can look forward to:

- Gaining access to design and technology orientated students to investigate your technical/business challenges at low cost and with minimal risks
- Owning intellectual property generated during the Capstone project
- Gaining access to a wide range of faculty technical expertise
- Having consistent exposure to gauge the abilities of students over the two-term (8-month) project duration to recruit the right talent with the right attitude and understanding of your business environment

HOW TO PARTICIPATE AS A CAPSTONE PARTNER

Be a Capstone Partner simply by:

- Providing details of your proposed Capstone projects using the ‘Project Form’ brief. (Please request for an editable softcopy from the Capstone Office)
- The ‘Project Form’ brief will help to facilitate subsequent project scoping discussions with SUTD to fine-tune the proposals.
- When the project scoping is completed, the approved project will be accepted as a Capstone project for selection by students during November and December.
- Signing the standard Capstone agreement letter. (Note: All intellectual property generated during the Capstone project belong to the Capstone Partner. There are non-disclosure clauses to safeguard confidential information.)
- Completing project scoping discussions and signing of Capstone agreement letters latest by August*, before the project starts in January the following year.

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CAPSTONE OFFICE CONTACT

For any queries, please contact the Capstone Office:

- Telephone: 6499 4076
- Email: capstone@sutd.edu.sg

MORE ABOUT SUTD

The Singapore University of Technology and Design (SUTD) was established in collaboration with the Massachusetts Institute of Technology (MIT) and seeks to advance knowledge and nurture technically-grounded leaders and innovators to serve societal needs. This will be accomplished, with a focus on Design, through an integrated multi-disciplinary curriculum and research.

There are four “pillars” or specialisations that prepare students for roles that involve design, technical leadership, and creative thinking:

- Architecture and Sustainable Design (ASD)
- Engineering Product Development (EPD)
- Engineering Systems and Design (ESD)
- Information Systems Technology and Design (ISTD)

*SUTD may stop accepting proposed capstone projects earlier if sufficient projects have been received for the year.