

Christ University
Hosur Road, Bangalore 560029

Project Proposal

Submitted to:
United Board for Christian Higher Education

I. Basic Information:

Name of institution submitting the proposal	Christ University, Bengaluru, India
Name of the institution's head or other responsible senior administrator (with email address and phone number)	[REDACTED]
Name(s) of person(s) preparing the proposal (with email address and phone number)	[REDACTED]
Name of the designated liaison person for the United Board (with email address and phone number)	[REDACTED]
Name of the proposed project leader (with email address and phone number)	[REDACTED]
Title of proposal	“Engineering-Service Assisted Integrated Learning” (E-SAIL), A Transformative Next Generation Student Connect and Pedagogy.
Executive Summary of the proposal	In the modern digital era where the focus is completely on developing next generation innovators and global citizens, It is a big challenge posed in front of the world-class universities / colleges to cFater quality higher education. This calls for the transformative initiatives which results from holistic planning and design of curriculum, evaluation, teaching-learning, research, policy framework and more. Universities in past evolved with a motive and was primarily intended to serve the society and bring out solutions to the unattended problems. With the growing technological phase, students are often isolated in their own spaces with very less time for personnel interaction or to be involved for the societal needs. This proposal E-SAIL (Engineering-Service Assisted Integrated

	learning) focuses broadly on looking at the consensus of the students to be ready for the future, aiming at professional skills, including the ability to work in a team environment, communicate effectively, work with customers, and manage projects, all in liaison with the curriculum and community. It aims at getting together to work with people from many different backgrounds and in many social settings.
Total cost of project	USD ██████████ (Rs. ██████████)
Total request for United Board support	USD: ██████████ (Rs. ██████████)
Exchange Rate	1 USD = Rs.66.50

II. Full-Narrative Proposal

Goals: What the project is trying to accomplish and how it relates to the mission and vision of your institution?.

The Project E-SAIL (Engineering – Service Assisted Integrated Learning program) , is designed based on the societal needs. It relates the immediate concern of “learning by doing”. The key being “Service to public “, [5] where teams of **undergraduate students would design, build, and deploy real systems to solve engineering-based problems for local community service and educational institutions to provide students with this hands-on multi-disciplinary learning experience in liaison with the curriculum.**

While educators seek to provide learning environments that prepare students for life as engineering professionals, not-for-profit organizations- such as community service agencies, schools, museums, and local government offices-face a future in which they must rely to a great extent upon technology for the delivery, coordination, accounting and improvement of the services they provide to the community. They often possess neither the expertise nor the budget to acquire or design a technological solution that is suited to their mission. They thus need the help of people with strong technical backgrounds. This would be accomplished through a team of professors who would put in their expertise and connect with several project partners to work in tandem with the communities. This goes purely in line with the vision of our university “ Excellence and Service” Being inspired by Blessed Kuriakose Elias Chavara, founder of Carmelites of Mary Immaculate (CMI) and the pioneer in innovative education. Christ University has always been at the fore front in developing newer strategies reading the signs of the time, where we strive to reach out to the star of perfection through an earnest academic pursuit for excellence and our efforts blossom into service through our creative and empathetic involvement in the society to transform it. What better could it server in aligning with our mission of providing a perfect ground for nurturing ones holistic development to make effective contribution to the society. The project Goals are thus in alignment with the vision and mission of Christ University.

Period of the Project: (Start and completion dates)

3 Years: July 2017 – June 2020. The project would initiate with the capacity building exercise and training the trainers programme during May-Dec 2017, along with identification of partners. At the same time the first cohort of students would be inducted during July 2017 and trained with basic necessary skills. They would be progressively mentored over a period of one year. April-May 2018 -- students and faculties would start working on need based project. 2019-2020 should see the first deployment of the project.

Leadership Team for the project and their Role:

Sl. No	Leadership team members	Role
1.	[REDACTED]	Chairperson
2.	[REDACTED]	Team Lead and Coordinator
3.	[REDACTED]	Consultant, Treasurer and Technical Support
4.	[REDACTED]	Consultant, Team Manager and Technical Support
5.	[REDACTED]	Consultant, Documentation and Technical Support

* Brief CVs given in Annexure

Other Universities and NGO's Involvement:

Other universities and educational institutions, which have implemented successful student and research centred pedagogical practices, will be explored to be involved. As their roles are limited and the participation is based on mutual agreement, there is no requirement for a letter to ensure their participation. Their role will be limited in providing training the university's teaching faculty, peer student leaders and the project implementation team.

Background and Rationale for the Project- The need or problem it will address and how the project will advance whole person education at your institution. Is the project new or has your college or university previously received a grant from the United Board or other sources in this general area?

Current research and practice related to the engineering experience of commencing higher education students are still mainly piecemeal rather than institution-wide with institutions struggling to achieve cross-institutional integration, coordination and coherence policy and practice. [21] It is argued that, when first generation co-curricular and second generation curricular approaches are integrated and implemented through an intentionally designed curriculum by seamless partnerships of academic and

professional staff in a whole-of-institution transformation, we have a third generation approach labelled here as transformative approach called transition pedagogy. It is suggested that transition pedagogy provides the optimal vehicle for dealing with the increasingly diverse commencing student cohorts by facilitating a sense of engagement, support and belonging. Many theories on teaching and learning in the adult learning context "...are constantly being reviewed and discussed in professional education, especially in terms of the university educational environment. Teaching and learning theories in this concept are not static and appear to be in a constant developmental process" [3].

Educational institutions, such as universities, are serious about undertaking various moves toward improving the quality of teaching and learning, especially in undergraduate education. Community service agencies face a future in which they must take advantage of technology to improve, coordinate, account for, and deliver the services they provide. They need the help of people with strong technical backgrounds. Undergraduate students face a future in which they will need more than solid expertise in their discipline to succeed. They will be expected to work with people of many different backgrounds to identify and achieve goals. They need educational experiences that can help them broaden their skills.[5]

The challenge is to bring these two groups together in a mutually beneficial way. In response to this challenge, several universities have taken the initiative to synergize these challenges of which Purdue University created EPICS: Engineering Projects In Community Service. The end result? Benefits to the students and to the community!, University of California, San Diego created "Teams in Engg. Services, Service Learning of University of Melbourne, The University of Queensland, Brisbane, created, "Collaborative Service Learning Program (CSLP)" George Fox university created "Servant Engineering Program", Illinois Institute of Technology created " Inter Professional Project program (IPRO), Ohio Northern University created ONUEPIC, Princeton University created community Based Learning Initiatives (CBLI) etc to name a few ..

We at Christ University plan to propose E-SAIL "Engineering-Service Assisted Integrated Learning", **which would reflect on one such model, which integrates the concept of community service in service learning through the Joy of designing engineering projects.** This experience would also fetch them academic credit by way of integrating the program with the ongoing curriculum in any semester.

This program E-SAIL proposed at Christ University revolved under the theme based on EPIC as co-founded by Professor Ed Coyle [8]. And is a unique program in which teams of undergraduates are designing, building, and deploying real systems to solve engineering-based problems for local community service and education organizations to provide students with this hands-on multi-disciplinary learning experience.

This project is new to the Engineering department of Christ University. Christ University's Centre for Social Action (CSA) had received a grant earlier in such general area. The goals of this project are in alignment with the vision and mission of Christ University, which gives utmost importance to holistic development of the student community. The concept of 'holistic development' is similar to the 'whole person' concept promoted by UBCHEA. The key features of the E-SAIL attributes are discussed below [12]

Service Learning:

Service learning combines service to the community with student learning in a way that benefits both the student and the community. According to the US National and Community Service Trust Act of 1993:

“Definitions: SERVICE LEARNING: The term 'service-learning' means a method: Under which students or participants learn and develop through active participation in thoughtfully organized service that:

- (i) is conducted in and meets the needs of a community;
- (ii) is coordinated with an elementary school, secondary school, institution of higher education, or community service program, and with the community; and:
- (iii) helps foster civic responsibility; and that:
- (i) Is Integrated into and enhances the academic curriculum of the students, or the educational components of the community service program in which the participants are enrolled; And:
- (ii) Provides structured time for the students or participants to reflect on the service experience.”

Key features of the E-SAIL model include the following attributes.

(i) Partnering with Non-profit Organization:

Each of the E-SAIL team will work closely with the delivery and support of a system that is used by the project partner to improve the services they provide to the community. The E-SAIL team's delivery-in most cases, at no cost-of systems that the project partner requests, provides the 'real-world' assistance that the partner needs to better serve the community. The very beneficial effects that these systems have on the community provide a compelling reason for students to join and pursue these projects.

(ii) Integrated teams:

A typical size of an E-SAIL team consists of eight to twenty students, thus enabling projects of significant scale and potential impact on the community to be undertaken. The large team size also enables them to be vertically-integrated; that is, to include first year, second year, pre-final year and final year students. In general, the final year students would provide technical and organizational leadership, the pre-final year and second year students would perform the technical work organized by the final year students, and the first year students would learn about the project partner's needs and participate in teams tasks as possible.

(iii) Sustained Student Participation:

An E-SAIL student can participate in an E-SAIL team for up to seven semesters, joining a team in the second semester of the first year, remaining with the team until graduation. New first year or second year could replace students that graduate or otherwise leave the team. There is thus significant continuity in team membership from semester to semester and year to year. When this continuity in membership is combined with team procedures for the training of new students and with mentoring by final year students and team

advisors, the team's effectiveness can be maintained for as long as required to complete a large-scale project. This continuity also provides each student with the time and mentoring opportunities required to learn and practice different roles on the team, from trainee to design engineer to team leader.

(iv) Choice Based Credit hours:

An E-SAIL student earns one credit per semester as a first year or second year. As third or final year, they earn 1 or 2 credits per semester, with the choice being made by the student each semester. The doubling of credits available to second and third year parallels their growing technical capabilities and organizational responsibilities. How the academic credit counts towards a student's graduation requirements varies by department. For example, in ECE, up to 3 credits may be used as ECE elective credit, and 6 credits in the final year may be used to fulfill the project design requirement.

(v) Multidisciplinary teams:

The large team size also enables students from disciplines across engineering and if possible could be extended around the university to participate in an E-SAIL team. The disciplinary composition of an E-SAIL team can thus be tuned to a project's needs. For example, teams producing devices to assist children or adults with disabilities could draw students from such disciplines as electrical engineering, mechanical engineering, Psychology, management, Social Work.

(vi) End-to-End Experience:

E-SAIL provides an end-to-end design experience for students. Each project begins with identification of the project partner's needs and the definition of a project to meet one or more of those needs. It then progresses through design, development, testing and deployment with the project partner. This process typically takes two or more years, thus providing the students with sufficient time to master the many different aspects of an engineering design project, including: exploration of design alternatives, project planning and management, team leadership, technical innovation, design revisions, and economic considerations.

The benefits of integrating service learning into an engineering curriculum have been documented in several recent papers,[15]. Recent examples of engineering service learning programs include projects integrated into first year-level introductory courses[18,19], final year project design courses [10, 13], and multidisciplinary approaches [16]. Other initiatives have sought to integrate the co-curricular activities of student organizations with engineering service learning [18].The E-SAIL program embeds engineering design in a service-learning context. This interweaving of design- and service-learning into an ambitious multidisciplinary, vertically-integrated course structure with an emphasis on long-term community partnerships and long-term engineering projects would be unique to Christ University and has never been executed in past in any of the departments at this length.

The service context for each E-SAIL design project provides a very compelling framework for the students. Metacognitive activities are woven into each semester to allow students to understand the connections between their technical projects and the community issues they are helping to address [12]. E-SAIL students thus learn many valuable lessons in citizenship, including the role of community service in our society; the significant impact that their

engineering skills can have on their community; and that assisting others leads to their own substantial growth as individuals, as engineers, and as citizens.

Short Description of the participants and ultimate beneficiaries of the project:

This project aims at students from multidisciplinary courses and who could be involved in addressing problems ranging from data management for social services to mitigation of agricultural pollution and from designing learning centers for local museums to developing custom play environments for children with disabilities, Water/power/transport management etc [5]. Each E-SAIL project would involve a team of eight to twenty undergraduates, a not-for-profit community partner:

As an Example:

A community service agency, a museum or school, or a government agency and a faculty or industry advisor. A pool of graduate teaching assistants from seven departments provides technical guidance and administrative assistance [8]. Each E-SAIL team is vertically-integrated, consisting of a mix of first year, second year, third year, and final years and operates for several years, from initial project definition through final deployment. Once the initial project(s) is/are completed and deployed, new projects could be identified by the team and its project partner, thus allowing the team to continue to work with the same community partner for many years.

Each undergraduate student may earn academic credit for several semesters, registering for the course for 1 or 2 credits each semester. The credit structure is designed to encourage long-term participation, and allows multi-year projects of significant scope and impact to be undertaken by the teams. Each student in the E-SAIL program attends a weekly two-hour meeting of his/her team in the E-SAIL laboratory. During this laboratory time, the team members address administrative matters, does project tracking and planning, and work on the technical aspects of their project. All students also attend a common one/two-hours lecture each week. A majority of the lectures are by guest experts, and could cover a wide range of topics related to engineering design, communication, and community service.

The long-term nature of the program may require some innovation in the lecture series which could be evolved with the passing of time [5]. This will also give ample of opportunity for the students in imbibing varied skill sets. Example skill session topics include learning to operate a DC Machine or lathe, developing effective surveys, conducting patent searches, and tutorials on multimedia software. Students use the skill sessions as a way of gaining specific expertise needed for their projects and an opportunity to broaden their experience, for example, a computer engineering student learning to use a lathe or a mechanical engineering student learning web programming, a science graduate student learning to work on Materials laboratory etc. There could be several beneficiaries derived out of the programme, students and community being the primary target followed by faculty members supported by the appropriate departmental and college administrators, the community, around the university, local government agencies, schools, hospitals, agriculture etc. to name a few.

Stages or phases of the project (timetable for implementation, highlighting the major activities or benchmark events): [Please see the attached sheet for detailed timetable for implementation.](#)

Phase 1 :

Major Activities: Identifying Project Partners / functionaries - Establishing project partners with NGO, other organizations. Making presentations and getting the relevant people on board. There could be some link established with respect to existing CSA(Centre for social Action) group of the university. Fixing on some selection criteria in choosing partners to work with etc..

Phase-II :

Major Activities: Preparing Project team and finalising strategy - Since this would be aligned with the curriculum, there need to be a good strategy to float these projects by the intervention of BOS (Board of Studies) and bringing them on board through proper counselling. We could also propose a student advisory council on which each team has a representative. Depending on the progress we could initially look at the interdisciplinary group within engineering and further progress into other deaneries with students representing computer science, sociology, psychology, education, English, media studies, management etc. A key aspect of this phase is identifying projects that satisfy three criteria: they are needed by the project partner, they require engineering design, and they are a reasonable match to the team's capabilities. This process of project definition culminates in a written proposal and presentation. The proposal must be approved by the E-SAIL advisor and accepted by the project partner.

Phase III :

Major Activities: System Design and Development: Following acceptance of the proposal, the project team's goal is to produce a prototype of the proposed system or service. Regular interaction with the project partner continues in order to ensure that the products being designed and developed are as desired. The formal portion of this interaction includes written progress reports, periodic design reviews, and presentations. A faculty advisor and a TA meet weekly with the team to provide technical supervision. This phase of a project lasts as many semesters as necessary for the team to complete the project to the satisfaction of the project partner.

Evaluation of the project- How the project will be assessed, to discern to what extent the project goals have been achieved. Please describe what success will look like and how it will be captured in the evaluation; include the name and contact information of the external evaluator, if applicable.

The evaluation of the project could be done based on the following criteria. There could be team comprising of academicians/NGO's and industry personnel who could assess the programme on biannual basis and however since the project involves constant interaction between the above mentioned groups; it's only about the deliverables that need to be taken care.

At the end of the first year the project would be assessed based on the following achievable [8].

- 1) Total no of organizations willing to partner
- 2) Completion of training and preparedness of the group
- 3) The real-time project components supported by the external agencies
- 4) No of departments in CU Deanery of Engineering that have taken up service learning model.
- 5) All these will indicate that this pedagogical approach has become a culture in Christ University. In other words it has been institutionalised.

Although there are several projects executed in line with service learning associated with the community services, there aren't any of these operating at the effectiveness of liaising with the curriculum on all semesters starting form first year. By its very nature of intricate functioning, no many institutes would be able to function with the above rigour. This proposal would be first of its kind in India to be executed at this rigour, directly giving due credit and integrating it into the curriculum, where by the students who would be the ultimate beneficiaries would imbibe a plethora of skill sets like.

- 1) Teamwork (teamwork, working with others, cooperation, accountability, etc),
- 2) Leadership (leadership, responsibility, motivating self and others, taking initiative, etc.),
- 3) Communication (communication skills, presentation skills, public speaking, report writing, communicating with clients, etc.),
- 4) Organization and Planning (organization, project planning, time management, meeting deadlines and timelines, goal setting etc.),
- 5) Technical Skills (technical expertise, programming, design process, testing, technical procedures, etc),
- 6) Real World Experience (real applications, realistic view of working world, experience for real life, etc),
- 7) Customer Awareness (customer needs, customer support, etc

8) Community Awareness (community needs, contribution to the community, value of service).

This paradigm shift in teaching learning and research would definitely lead to a great transformation towards the next generation student connect and Pedagogy.

Sustainability –Describe how the project will continue after United Board funds are expended, or how its outcomes or lessons learned will continue to benefit your institution. Please include intended sources of support for continuing activities, if Any.

The programme in itself is self-sustaining, The undergrad projects undertaken by the group of Engineering students in Community Service Program would add several new dimensions to the educational experience of engineering under-graduates at Christ-University. However once the programme is offered to a batch of undergraduate students, We believe there would be a higher demand of learning by doing. At Christ University we believe in “Excellence and Service” and what other means could be identified than making the engineering learning most beneficial to the community at a large, through E-SAIL mode. With the advent of newer policies and reformations enforced by UGC (University Grant Commission), Service learning and implementing the concept of choice based credit system in itself is a motivation towards greater sustenance.

This will include the student’s versatility in understanding several concepts and different phases of design process and large-scale design projects in a service-learning context. Gradually the ability to define, develop, and deliver ambitious projects to their partners in the community would foster a lasting relationships with the community and a high level of mutual commitment. We strongly believe that professional skills, including teamwork and communication, can be learned while participating in realistic design teams. This would only let the whole organization grow holistically by creating a nurturing ground to one’s holistic development to make effective contribution to the society.

III. Detailed Itemized Budget (Please see the attachment)

IV Endorsement by Head or Senior Administrator of the institution

Name of institution’s head or other senior administrator with responsibility for overseeing the proposed project:	Dr. (Fr.) Thomas C. Mathew
Title or position in the institution:	Vice Chancellor
Signature:	 Vice Chancellor Christ University Bengaluru - 560 029
Date:	28.10.2016

V. Appendices:

1. **Institutional Profile** (see next page).
Please submit an updated profile (one copy for every institution).

2. **Additional background information.** We welcome additional information relevant to making the case for the project. Please limit to several pages only



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Title of the Project: “Engineering-Service Assisted Integrated Learning” (E-SAIL), A Transformative Next Generation Student Connect and Pedagogy.

Stages or phases of the project (timetable for implementation, highlighting the major activities or benchmark events):

Major Activities/Benchmark Events	Timetable for Implementation											
	Year 1: 2017-18				Year 2: 2018-19				Year 3: 2019-2020			
	Jul-Sept	Oc-Dec	Jan-Mar	Apr-Jun	Jul-Sept	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sept	Oct-Dec	Jan-Mar	Apr-Jun
Phase 1	Identifying Project Partners / functionaries - Establishing project partners with NGO, other organizations. Making presentations and getting the relevant people on board. There could be some link established with respect to existing CSA(Centre for social Action) group of the university. Fixing on some selection criteria in choosing partners to work with etc..											
Meeting with Christ University (CU) management to bring about a buy in and training module development and session planning.	X	X										
Meeting with the Deanery and HoDs for building a consensus.	X	X										
Conduct baseline study to benchmark the existing kinds and extent of pedagogical practices & knowledge & reaction of teachers and students with	X	X										

regard to them. (International Symposium)												
Identification and Training of teachers based on discussions and skill sets.	X	X	X									
Applications inviting partners to collaborate			X	X								
Shortlisting of the projects			X	X								
Phase-II	<p>Preparing Project team and finalising strategy - Since this would be aligned with the curriculum, there need to be a good strategy to float these projects by the intervention of BOS (Board of Studies) and bringing them on board through proper counselling. We could also propose a student advisory council on which each team has a representative. Depending on the progress we could initially look at the interdisciplinary group within engineering and further progress into other deaneries with students representing computer science, sociology, psychology, education, English, media studies, management etc. A key aspect of this phase is identifying projects that satisfy three criteria: they are needed by the project partner, they require engineering design, and they are a reasonable match to the team's capabilities. This process of project definition culminates in a written proposal and presentation. The proposal must be approved by the E-SAIL advisor and accepted by the project partner.</p>											
Orientation program for teachers, team leaders, HoDs on need for pedagogy, providing leadership and Changes in curriculum through Board Of Studies.		X		X								
Setting up/strengthening of Students Centre for Academic Support		X	X	X	X	X						
Student training to commence with the industry partner.				X	X							

Outreach and project identification with the help of partners		X			X	X						
Prototype model			X	X			X	X				
Implementation of the learning (pilot basis) derived by the student peer leaders.							X	X				
Evaluation of the Prototype Collecting feedback to capture learning at the end of pilot phase particularly: a. Immediate reaction-learning as felt by the teachers and the student peer leaders. This includes capturing success stories and challenges faced. b. Extent of transfer of learning both by teachers and student peer leaders. c. Return of investment (interventions) in terms of extent of pedagogical practices implemented and support rendered to the student community by the student peer leaders.				X			X	X				

Phase III	System Design and Development: Following acceptance of the proposal, the project team's goal is to produce a prototype of the proposed system or service. Regular interaction with the project partner continues in order to ensure that the products being designed and developed are as desired. The formal portion of this interaction includes written progress reports, periodic design reviews, and presentations. A faculty advisor and a TA meet weekly with the team to provide technical supervision. This phase of a project lasts as many semesters as necessary for the team to complete the project to the satisfaction of the project partner.											
The trained teachers and student peer leaders continue to support undergraduate students through the E-SAIL, Centre					X	X	X	X	X	X		
Student Conclave : Generating National and International awareness with the students of various universities. Actual Prototype demonstration.					X	X	X	X	X	X		
Assistance extended in actual real time development of the product									X	X		
Attempt to enable all the teachers to adopt student and research centered pedagogical practices						X	X	X	X	X		
Deployment of project on site.										X	X	
Feedback from the benefiting community, and recommend some											X	

reformations to the policy.													
Invitation to UB staff in witnessing the finished product as deployed to the community. Submit all the report and project completion report to UBCHEA.												X	X
Continue the projects with several other deaneries and invite more no of interdisciplinary projects..													X