

◆ E-SAIL ◆



A REPORT ON

Engineering Service Assisted Integrated Learning (E - SAIL)

[2018 – 2019]

Faculty of Engineering

CHRIST (Deemed to be University)

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ABOUT E-SAIL

The Engineering Service Assisted Integrated Learning (E-SAIL) is a service learning initiative of the Faculty of Engineering, **Christ (Deemed to be University)**. It has distinguished itself by setting a firm foundation that would enable students to give back to the society from the knowledge acquired from CHRIST (Deemed to be University).

Project E- SAIL is designed based on societal needs. The program helps undergraduate students learn by doing practical assignments wherein they design, build and deploy real systems that solves community problems which is in line with their academic curriculum.

While, it is the principal responsibility of NGO's and Government Organizations to address and solve community issues, they are constrained by limited budget, resources and technical knowhow. This presents an opportunity for academic institutions like CHRIST (Deemed to be University) to provide their expertise and resources to these organizations and work in tandem with them to solve societal problems. It is this opportunity that CHRIST (Deemed to be University) is utilizing to carry out pioneering work.

This endeavor is purely in line with CHRIST (Deemed to be University) vision - "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**.

CONCEPTUALIZATION

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, makes it unique to **Christ University**. Meta-cognitive activities are woven into each semester to allow students to understand the connections between their technical projects and the community issues they are attempting to address. 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, engineers, and citizens.

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

- (i) Partnering with Non-profit Organization
- (ii) Integrated teams
- (iii) Sustained Student Participation
- (iv) Choice Based Credit hours
- (v) Multidisciplinary teams
- (vi) End-to- End Experience

This conceptualization would be first of its kind in India to be executed at this rigor, 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)
2. Leadership (leadership, responsibility, motivating self and others, taking initiative)
3. Communication (communication skills, presentation skills, public speaking, report writing, communicating with clients)
4. Organization and Planning (organization, project planning, time management, meeting deadlines and timelines, goal setting)
5. Technical Skills (technical expertise, programming, design process, testing, technical procedures)
6. Real World Experience (real applications, realistic view of working world, experience for real life)

7. Customer Awareness (customer needs, customer support)
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.

VISION

The Project E-SAIL (Engineering – Service Assisted Integrated Learning) program, is designed based on the societal needs, the focus being Innovation. It relates to the immediate concern of “learning by doing”, the key being “Innovation in Service to Public”. Here a team of students would design, build, and deploy real systems to solve engineering-based problems for local community service and educational institutions. This would further provide students with 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 (Deemed to be University) has always been at the forefront in developing newer strategies reading the signs of time, where we strive to reach out to the star of perfection through an earnest

academic pursuit for excellence. Our efforts blossom into service through our creative and empathetic involvement in the society to transform it. What better could it serve in aligning with our mission of providing a perfect ground for nurturing one's holistic development to make effective contribution to the society.

Dr. Iven Jose
Principal Investigator
CHRIST (Deemed to be University)

OBJECTIVES

The objective of E-SAIL is to impact the lives of villagers living in and around the Faculty of Engineering Kengeri Campus, by offering innovative solutions addressing real world problems. The E-SAIL program has introduced students to invested involvement in society and its problems. Contact with NGOs, MNCs, Bureaucrats, Academicians, Scientists, and Industrial Experts help students to innovate at a more advanced level. It is a very important aim to bring together individuals from different walks of life and to continue the academic-societal connect that is beneficial and should be imbibed in engineering aspirants. It also helps the target communities of the E-SAIL project, to deal better with problems that they face, with the help of real system designs that are designed by the students.

<One para>

TEAM BUILDING

The soul of E-SAIL project is its team. The entire campus student community is initially addressed by the Dean and the concept of E-SAIL is explained to them. Following this, the E-SAIL faculty coordinator elaborates on the concept and the potential projects, to only those who are desirous of being part of E-SAIL.

Student Induction: The formal procedure is laid out to induct student into the E-SAIL team. The student who meet the eligibility criteria and performs well in the entrance exam should take personal interview where in the student is evaluated on the capability of executing societal innovative projects. The students are evaluated by a written test covering aptitude and subject knowledge. Students, who clear the written test, are then interviewed to judge their social affinity and capability. Those selected from the interview are then inducted in to the student team.

Faculty Induction: The volunteered teachers from various departments are inducted into E-SAIL team. The teachers are expected to assist student in various aspects such as technical training, mentoring, networking and facilitation of requirements. The faculties, responsible for the formation of the team follows a rigorous two-tiered selection process while choosing students from the final three years of engineering.

Mentoring System: A faculty mentor assigned for each student the facilitation and guidance to undertake the part in the project. This is the first level of addressing student's concerns.

A typical project organization will take the following form:-

	Task Force A	Task Force B	Task Force C	Task Force D	Task Force E
Team	Ground Liaison team	Technical team	Procurement team	Finance team	Logistics and Documentation team



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CHRIST

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Re spo nsi bili ties	Village interactions, Data collection, site coordination	Data analysis, prototype design, testing, obtaining approval	Market survey, cost evaluation, price negotiation, component procurement	Fund proposals, bill compilation, internal auditing, balance sheet, account settlement	Project report preparation, presentations, document approvals, administrative and logistic support, safety and health aspects
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<Some points>

TEAM MEMBERS

The faculty and student members from various departments constituting the E-SAIL team are as follows,

Principal Investigator:

No	Name	Role	Area of Interest
1	Dr. Iven Jose Associate Dean, CHRIST (Deemed to be University)	P r i n c i p a l Investigator	Optical Imaging in Medical Diagnostics

Faculty Members:

No	Name & Designation	Department	Area of Interest
1	Colonel Sudhir M R, E-SAIL Coordinator & Professor	Civil Engineering	Design Management, Structures, Societal projects driven through life in defense and industry experience.
2	Dr. Pal Pandian, Associate Professor	Mechanical Engineering	Project Management, Industrial Automation and Material Handling.
3	Mrs. Jyoti Thomas Associate Professor	Computer Science Engineering	Service Learning, Soft computing, Career guidance and leadership, Data mining
4	Adarsh S V Assistant Professor	Civil Engineering	Environmental Engineering: Waste water, Solid waste management, Alternative systems, Building materials
5	Mithun B N Assistant Professor	Computer Science Engineering	Big data analytics, Innovative and Societal projects, Career Guidance
6	Vivek Ram Assistant Professor	Electronics and Communication Engineering	Antenna design, Microwave, Wireless applications
7	Bijeesh TV Assistant Professor	Computer Science Engineering	Internet of Things, Web programming, Image processing

8	Venkataswamy R Assistant Professor	Electrical and Electronics Engineering	Embedded systems, Smart applications, Open source software, Energy Conservation
9	Darshan S M Assistant Professor	Mechanical Engineering	Nanocomposites, Polymeric materials, Project management

<New faculty>

Student Members:

No	Name	Department	Register No	Year
1	MUNEER AHMAD	Computer Science Engineering	1660456	II
2	NAKUL K MOHAN	Mechanical Engineering	1661472	II
3	RIVYA ANN TONY	Computer Science Engineering	1660470	II
4	ROBIN P LUKE	Civil Engineering	1660126	II
5	RUDRIN BASU	Computer Science Engineering	1660480	II
6	SERAH VARGHESE	Computer Science Engineering	1660441	II
7	VIREN LUKE RADHAKRISHNAN	Computer Science Engineering	1660395	II
8	YUVARAJ A	Computer Science Engineering	1660446	II
9	ASHLY MATHEW P	Electronics and Communication Engineering	1560553	III
10	AYESHA	Electronics and Communication Engineering	1560710	III
11	ELDHO PAUL	Mechanical Engineering	1561361	III
12	GEET JETHWANI	Computer Science Engineering	1560508	III
13	RAVEENA JOKIM CRASTHA	Electronics and Communication Engineering	1560711	III
14	SAYANTAN SAHA	Electronics and Communication Engineering	1560559	III
15	VARUN KAPOOR	Computer Science Engineering	1560430	III
16	POOJA K SAWANT	Computer Science Engineering	1417146	IV

17	S N E H A KRISHNAMOHAN THAMATTOOR	Civil Engineering	1417408	IV
18	AMAN BANSAL	Electronics and Communication Engineering	1417189	IV
19	S A R A N S H SHARMA	Computer Science Engineering	1417198	IV
20	ANGLET C J	Electronics and Communication Engineering	1417213	IV

<Change semester>

<Add new student>

SKILL DEVELOPMENT

<Add all the event in the year>

RPA

Drone

KNU visit

Iven China

IIT Bombay

The student team interacts with the faculty to identify areas that they would need to be trained in. The skill development includes software training, data analysis, understanding and reviewing similar case studies from other global projects such as EPICS, SEEC etc. The students and faculty members are also encouraged to attend conferences, workshops, symposiums, meeting external people and bodies.

In this regard, Colonel Sudhir M R (Associate Professor, CE), visited Tata Center Technology and Design, IIT Bombay. The various aspects like structure of centre, social relevant projects, courses, collaboration model, facilities available were observed.

IUCEE – EPICS Annual Symposium, Hyderabad: EPICS is a community-oriented program initiated by Purdue University which is conceptually similar to E-SAIL of CHRIST (Deemed to be University). Colonel Sudhir M R (Associate Professor, CE) and Mr. Bijeesh T V (Asst. Professor, CSE) attended the Annual Symposium organized by IUCEE-EPICS on 12th, 13th and 14th July 2018 at Hitech City, Hyderabad. The main purpose was to understand the implementation of global EPICS projects and to identify areas for replication in E-SAIL projects. The symposium was jointly organized by IUCEE (Indo Universal Collaboration for Engineering Education) and EPICS in IEEE. The sessions were handled by the Prof. William Oaks, Purdue University, USA.

The aim of the symposium was to bring together the institutions that are already under the EPICS umbrella along with institutions working on similar programs to contemplate on ways to build a strong network to take EPICS to newer heights in India. The three days symposium was conducted as interactive sessions by breaking the participants in to different groups and initiating discussions on to how EPICS can be implemented and adopted by different types of institutions. Prof. Oaks acknowledged the fact that India has many different types of institutions and hence require multiple models for successfully implementing EPICS. One of the major challenges that most of the participants thought on implementing EPICS was on the modalities of incorporating EPICS or similar programs into the curriculum. The symposium has given the participants an overview of the implementation models of EPICS and has helped them build a network of institutions who would like to collaborate and take this forward.



FIRST FORAYS

The E-SAIL team visits identified villages and interact with the village panchayat members and residents. They visit the community infrastructure such as health center, water treatment plants, veterinary hospitals, sanitation systems to develop a deeper understanding of the challenges faced by the villagers. These activities are recorded, discussed and deliberated by the team to identify potential E-SAIL projects. Based on several village interactions, the E-SAIL team has zeroed in on Water, Agriculture and Health as the three major project domains for project work.

In furtherance to the E-SAIL objectives, a need was felt for a larger understanding on methodology of implementation of E-SAIL projects. Towards this, an international conference was organized from 01 March 2018 to 03 March 2018 to bring subject matter experts from various disciplines to the campus and understand & learn from their experiences.

<Current development tune>

ACCOMPLISHMENTS AND ACHIEVEMENTS OF 2017-18

The concept of E-SAIL took small and steady steps towards achieving its objectives. Some of the major accomplishments of E-SAIL 2017-18 are

United board visit details

1. Creation of a team of motivated faculties and students who collectively worked for progressing the concept in the first year.
2. Internal Competency Building of the team and identifying the three major domains of project work namely Water, Health care and Agriculture.
3. The web portal is developed and hosted. All the open content available at the web portal. The web address is <http://e-sail.christuniversity.in>
4. Village visits by the team and the development of the social sensitiveness among team members.



5. Visited to the Anchipura village near Byramangala, Ramanagaram Taluk. Spoke to villagers and teachers of government primary school about their life style. The observations are they use water from Vrushabhavati river for cultivating baby corn four times a year. This will be distributed to Namdari and Airtel companies. Poluted water is used for cattle farming and agricultural activities. People are suffering from diabetics at the age of 30. Few people died because of cancer.
6. Visited primary healthcare centre at Byramangala. Spoke to Dr. Raju, PHC In-charge, He had done many surveys and observed that people in the bank of Vrushabhavati river are suffering from thyroid problem, diabetics and few skin related deceases. The survey has conducted with help of CancerIndia. Toyota is assisting PHC with medical diagnostics. We had discussed about conducting complete health check up in coordination with PHC for at least three villages.

7. Tree plantation drive: As a symbol of beginning and to create social awareness among the student tree plantation drive was conducted in house.



8. Conduct of a three days International conference on “A Transformational Next Generation Pedagogy” on 01 March - 03 March 2018 at CHRIST (Deemed to be University) by inviting speakers of national and international reputation to include Industry experts, NGOs, Bureaucrats, scientists, academicians etc.





Mr. Haja Mohideen addressing student on Innovation and Creativity



E-SAIL student members at the International Conference



Dr. Kumar V Singh
Miami University



Ms. Madeline Spurlock
Miami University



Mrs. Subha Ramachandran
BIOME Solutions



Dr. Iven Jose
CHRIST (Deemed to be University)

9. The news article is published in “The Hindu” newspaper.

ENGINEERING SOCIETAL CHANGE

Addressing societal change through a transformational next generation pedagogy



By Iven Jose

“The thought behind E-SAIL is that it should go beyond being just a course and ultimately, engineering education.”
Iven Jose, Associate Dean, Faculty of Engineering

The concept has a strong global context and the need of such an initiative has been recognized by the industry and academia. The industry is looking for graduates who are not only technically sound but also socially responsible and capable of addressing the societal challenges. The industry is looking for graduates who are not only technically sound but also socially responsible and capable of addressing the societal challenges. The industry is looking for graduates who are not only technically sound but also socially responsible and capable of addressing the societal challenges.

Industry Relevance

The industry is looking for graduates who are not only technically sound but also socially responsible and capable of addressing the societal challenges. The industry is looking for graduates who are not only technically sound but also socially responsible and capable of addressing the societal challenges. The industry is looking for graduates who are not only technically sound but also socially responsible and capable of addressing the societal challenges.

ROAD MAP FOR 2018-19

While a tremendous effort goes into the initiation of such a large scale project, a much greater effort is required maintaining it. E-SAIL will expand further with its integration into the curriculum and its availability as a credit-course. Students would then be able to dedicate proper time, energy and resources to developing working models that can be deployed against specific issues that they wish to address. A conscious effort to build the academia-societal connect is being made in keeping with the focus of ‘giving back to society’. Projects that are worked on under the E-SAIL umbrella, would involve repeated visits to communities that would benefit from the model being developed. A greater interaction with community that would better convey the matter to the students is necessary. Repeated cycles of developing a model, testing it for ways to improve the prototype and reworking the findings into the design before finally making a working model that can be marketed, even on a commercial scale will take place before these projects are presented to a larger platform for knowledge dissemination. Firm and continued collaboration with non-academic bodies such as NGOs, MNCs, Government bodies and private parties are a necessity that is instrumental in ensuring the realization of E-SAIL’s full potential.

The immediate activities planned and ongoing are as follows,

1. Three students and two faculties are attending international convention of “Environment protection through sustainable waste management” in Ramaiah University of Applied Science on 3rd August 2018.
2. Training session for E-SAIL student on “Know-How on Robotic Process Automation and Bot” is planned on 29th and 30th in association with Centre for Digital Innovation (CDI), CHRIST (Deemed to be University).
3. Workshop on “Data Analytics” from IBM Watson is planned on 2nd August 2018.
4. The process of induction of the students for E-SAIL team for the year 2018-19 is started with address by Dr. Iven Jose, Associated dean; address by Colonel Sudhir MR; and two rounds of written test. This year two additional components are introduced in the selection process. They are psychometric test and village visit report. Based on overall

impression and performance the student will be selected to E-SAIL team. The total number of students absorbed will be proportional to the nature and magnitude of the project and strategic plan.

<Planned activity for 2019>

OBJECTIVES OF 2018-19

- (a) Expanding the concept to other Deaneries and establishing project partners.
- (b) Project identification and creation of Project groups with defined roles.
- (c) Project budget management.
- (d) Curriculum development and Project office functioning.

2017-18 is the first year of E-SAIL concept. While, small and steady steps have been taken in the first year, the second year 2018-19 will be a promising and defining year. During the year, we intend consolidating on the gains of the first year and progress further. Some of the major activities planned for the year 2018-19 are in succeeding paragraphs.

E-SAIL team is currently an interdisciplinary group consisting of engineering students of various disciplines. The way forward this year will be to progressively build a team consisting of inter-deanery students from Sociology, Psychology, English, Commerce, management etc. A critical factor here will be to take up a Project with inter-deanery focus.

The Project so identified with an inter-deanery focus will be subjected to an approval scrutiny of project partners, industry experts and advisers. Following the acceptance of the proposal from all stakeholders, the team will commence work towards a prototype building

<Individual team objectives>

CONCLUSION

The E-SAIL (Engineering-Service Assisted Integrated learning) projects focus 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. The project will remain committed to getting students and mentors work together respecting the diversity of people from many different backgrounds and execute societal engineering projects successfully in the coming years. The first year saw the students gaining a feel of societal issues during their village visits. The coming year will be a year of consolidation in that student teams will progress towards an engineering solution to the identified societal problem. The year of progress and consolidation 2018-19, will be an exciting and challenging for the E-SAIL team. Buoyed by the success of the first year, the team will be pursuing this year's objectives with optimism and confidence.

<Tune>

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