Assessment of the Literacy and Knowledge on Sustainability

KITS has a system for assessing literacy and knowledge on sustainability.

1. Nonacademic credits for participation in awareness programs and activities related to SDGs – Centre for Extension Activities
2. Enrolment of faculty and students in one of the 25 Technology Missions aligned towards SDGs.
3. Activities through Ministry of Education's Innovation Cell for incubation and startups in thematic areas of SDGs
4. Experiential Learning Programme (ELP) and Rural Agricultural Work Experience (RAWE) for gaining knowledge and acquiring skills in environmental sustainability.
5. Project based and skill-based learning.

4.3.7 Community and Service Learning: Social work forms an integral part of a comprehensive education system. Considering the importance of these activities in a university environment and also taking into cognizance the focal areas of the University namely Water, Food, Healthcare & Sustainable Energy addressing the livelihood issues of people, the students shall involve in extension and Service learning to earn credits. For the students of B.Sc. (Hons) Agriculture RAWE & ELP will be considered equivalent to Community Development & Service learning. This Program shall be prepared and approved in advance by the statutory bodies of KITS.

S.No.	Program	Semesters	Credit
1	B.Tech.	II, III, IV, V, VI & VII	1 per Semester
2	M.Tech.	I & II	1 per Semester
3	B.Sc. (Hons) Agriculture	VII – RAWE VIII – ELP (2 modules)	20 Credits 10+10 Credits
4	B.A., B.Sc., B.Com., B.Sc.(Hons) Optometry	II, III, IV & V	1 per Semester
5	M.A., M.Sc., MBA	I & II	1 per Semester

Those involved in NCC shall also be eligible for two credits during the entire Program. This is applicable for all UG and PG Programs.

Link: https://www.karunya.edu/iqac/sustainability

1. Nonacademic credits for participation in awareness programs and activities related to SDGs – Centre for Extension Activities

The Centre for Extension Activities (CEA) aligns its educational and community engagement initiatives with the Sustainable Development Goals (SDGs), utilizing a comprehensive assessment methodology to gauge and enhance knowledge on sustainability among students and faculty. This methodology, centered on practical involvement in sustainability-focused projects and activities, underscores the commitment to fostering a culture of responsibility towards achieving global sustainability targets.

1.1 SDG-Oriented Objectives and Assessment Methodology

- **Enhancing Sustainability Literacy**: Through targeted research and outreach, the CEA aims to deepen understanding of societal needs in food, energy, water, and healthcare, directly supporting SDGs 2, 6, 7, and 3. The assessment of knowledge gained is facilitated by activities that measure the impact of these initiatives on participants understanding of sustainability issues.

- **Community Development and Support**: Initiatives to develop local villages and engage with underprivileged communities in association with Centre for Community Academia, contribute to SDGs 1, 10, and 11. The effectiveness of these efforts is evaluated through participatory appraisals, tracking improvements in socioeconomic status, natural resource management, and overall well-being of the target communities.

- **Empowerment Through Skill Development**: In association with Food Processing Engineering, vocational training and co-curricular activities are conducted aiming at personal and professional growth addresses SDGs 4 and 8.

- **Innovation for Sustainable Solutions**: Projects and activities designed to produce innovative solutions in the form of papers, products, patents, and consultancy works contribute to SDG 9. The assessment involves tracking the number and quality of outputs that directly address sustainability challenges.

1.2 Implementation Strategies with a Focus on SDGs

- **Sustainability in Extension Activities**: The CEA ensures that all non-academic activities, whether through clubs or individual initiatives, are aligned with sustainability goals, enhancing students' and faculty engagement with environmental, social, and economic sustainability challenges.

- **Policy Framework Incorporating SDGs**: Policies **governing non-academic credits**, club activities, and community engagement are crafted to encourage active participation in sustainability-focused activities to measure and improve sustainability literacy and impact.

- **Registration and Participation Policies**: Policies encouraging the registration of students and faculty for sustainability-centric clubs and activities are implemented, aiming to broaden the community's involvement in sustainability efforts.

- **Structured Orientation and Action Plans**: Orientation programs introduce participants to the SDGs and the role of the CEA's activities in achieving these goals. Action plans for clubs and groups are designed with clear sustainability targets.

Link for more details: https://www.karunya.edu/cea

EXTENSION ACTIVITIES		
Sl. No.	**Name of the Club**	**Link**
1	NCC	https://docs.google.com/spreadsheets/d/1jJm-NsOqkuj1Y3EICfUPk2dP2eZqY8r9sBLZEcswOqY/edit?usp=sharing
2	NSS	https://docs.google.com/spreadsheets/d/13hWbRFFn9CEyXnVFvY2UrVDK_JqzznIJ5ATgqBl3S1Y/edit?gid=605991918#gid=605991918
3	Rotract - Tech Unit	https://docs.google.com/spreadsheets/d/1zbYWimPxCcBPd2airfhYXPkO1KeOR7YZcynxc7hw9AM/edit?usp=sharing
4	Rotract - KSM Unit	https://docs.google.com/spreadsheets/d/1yn8hP-WYlyeb7jUID6VhTsCcNg7l-DsGnlsxPO3SCQo/edit?usp=sharing
5	Photography & Video	https://docs.google.com/spreadsheets/d/1J9jx_fVsX-eeR-Y6QKiiWR1SEOPq11ClzV6dNSd9HX4/edit?usp=sharing
6	Music	https://docs.google.com/spreadsheets/d/1dKCnhwydGxLxqFAWZQ462oFdOs0YdmhR7MtlZ9VW6sk/edit?usp=sharing
7	KALA	https://docs.google.com/spreadsheets/d/1e6OtNRDcU6VlhTZqDH3pCPFPEV3Ghd9YtnGdAa9Dyck/edit?usp=sharing
8	Journalism	https://docs.google.com/spreadsheets/d/1sZY-V3QPFkP9FZdw-8YesXHAswr1qufVAcoEAZ2-Ldk/edit?usp=sharing
9	Outreach	https://docs.google.com/spreadsheets/d/1IEnZfC6H8epajK04pzHg5pvR1oF9Bp10eiKIVxDJ03M/edit?usp=sharing

2. Enrolment of faculty and students in one of the 25 Technology Missions aligned towards SDGs

Link: https://karunya.edu/technologymissions

The Technology Missions at KITS are strategically aligned with the United Nations' 17 Sustainable Development Goals (SDGs), demonstrating a comprehensive approach to leveraging technology for global sustainability and well-being. The establishment of Technology Missions at KITS is a forward-thinking approach aimed at integrating emerging areas of science and technology with the United Nations' 17 Sustainable Development Goals (SDGs).

Objectives Aligned with SDGs

1. **Capacity Building**: Enhancing knowledge and skills among faculty and students in cutting-edge technologies, aligning with SDG 4 (Quality Education).
2. **Focused Research Areas**: Leveraging innovative tools in Water, Food, Healthcare, and Renewable Energy sectors, addressing SDGs 2 (Zero Hunger), 6 (Clean Water and Sanitation), 3 (Good Health and Well-being), and 7 (Affordable and Clean Energy).
3. **Innovative Outputs**: Generating projects, publications, products, patents, and consultancy works, contributing to SDG 9 (Industry, Innovation, and Infrastructure).
4. **Global Collaboration**: Partnering with international communities to enhance global scientific and technological exchange, supporting SDG 17 (Partnerships for the Goals).
5. **Societal Impact**: Applying modern technologies to solve critical societal issues, promoting SDGs related to health, nutrition, water treatment, renewable energy, and sustainable technologies.

Contextual Relevance of Technology Missions to SDGs

In the era of Industry 4.0, embracing technologies such as AI, IoT, and Blockchain is crucial, but their application remains limited. Recognizing this gap, KITS has initiated Mission mode operations targeting practical applications in key sectors like Water, Food, Healthcare, and Renewable Energy. This initiative is vital for achieving SDGs, leveraging international collaborations to introduce these technologies in India, thus addressing environmental sustainability and development challenges.

Practices Towards SDGs

KITS has identified 25 Technology Missions focusing on modern technologies relevant to societal needs, specifically targeting: Here's how these missions contribute to achieving the SDGs:

1. Millets for Nutrition Mission (SDG 2, 3, 12)
2. 3-D Printing and Additive Manufacturing (SDG 9, 12)
3. Green and Sustainable Manufacturing (SDG 9, 12, 13)
4. Indigenous and Herbal Medicine (SDG 3, 15)
5. Cyber Security Knowledge Mission (SDG 16)
6. Technology Mission for Rural Development (SDG 1, 8, 9, 10)
7. Smart Intelligent Buildings Mission (SDG 7, 11)
8. Vaccinology for Viral Diseases Mission (SDG 3)
9. Isotope Application Mission (SDG 3, 7, 9)

10. Smart City Mission (SDG 9, 11, 13)
11. Green Energy Technology Mission (SDG 7, 9, 13)
12. Wetland Conservation Mission (SDG 6, 13, 15)
13. Machine Learning Technologies for Societal Problems (SDG 3, 4, 9, 11)
14. Satellite and GIS Application Mission (SDG 9, 11, 13, 15)
15. Smart Vehicle Mission (SDG 9, 11, 13)
16. Drone Technology for Agricultural Mission (SDG 2, 9, 15)
17. Smart Technology for Precision Farming (SDG 2, 9, 12)
18. Technology Mission for Food Security (SDG 1, 2, 12)
19. Robotics in Everyday Life Mission (SDG 3, 8, 9)
20. Water Treatment and Desalination Mission (SDG 3, 6, 14)
21. Small Satellite Technology Mission (SDG 9, 11, 13)
22. Data Analytics & Block Chain Mission (SDG 9, 16, 17)
23. Stem Cell Research Mission (SDG 3, 9)
24. Nanotechnology For Healthcare & Vaccinology Mission (SDG 3, 9)
25. Medical Devices Mission (SDG 3, 9)

Each mission integrates KITS's efforts towards advancing the SDGs, employing interdisciplinary technologies to address global challenges, from health and well-being to environmental sustainability and economic growth. The implementation of these missions has resulted in significant achievements, including awareness programs, research publications, product development, and national and international collaborations, showcasing the effective application of these technologies in solving societal problems and advancing SDGs.

S. No	Technology Mission	Name of the Leader	No. of Faculty Members	No. of Student Members	No. of Papers Published	No. of Patents Filed	No. of Products Developed	No. of Project Submitted to Funding Agencies	No. of Projects Sanctioned by Funding Agencies	No. of Events Conducted	No. of Technology Transfers Made	No. of Incubations/ Startups Initiated
1	Millets for Nutrition Mission	Dr. T.V. Ranganathan	10	120	4	1	2	-	-	-	-	-
2	3-D Printing and Additive Manufacturing	Dr. Wilson Kumar	5	45	-	1	-	-	-	1	-	-
3	Green and Sustainable Manufacturing	Dr. Arul Kirubakaran	9	185	7	-	1	1	1	2	-	1
4	Indigenous and Herbal Medicine	Dr. David Paul Raj R S	6	150	6	2	2	-	-	2	-	1
5	Cyber Security Knowledge Mission	Dr. Esther Daniel	8	134	22	-	-	1	-	2	-	-
6	Technology Mission for Rural Development	Dr. A. Hepzibah Christinal	7	600	-	1	3	-	1	20	-	-
7	Smart Intelligent Buildings Mission	Dr. Gerald	6	90	5	1	-	-	-	4	-	1
8	Vaccinology for Viral Diseases Mission	Dr. M.S.A. Muthukumar Nadar	4	24	1	1	-	8	2	2	-	1
9	Isotope Application Mission	Dr. Khanna	4	4	-	-	-	1	-	-	-	-
10	Smart City Mission	Dr. Merlin Gilbert	6	75	52	3	-	1	1	1	-	-
11	Green Energy Technology Mission	Dr. Prawin Angel	13	20	25	3	-	3	1	1	-	-
12	Wetland Conservation Mission	Dr. Brema	7	22	5	-	-	4	1	2	4	-

S. No	Technology Mission	Name of the Leader	No. of Faculty Members	No. of Student Members	No. of Papers Published	No. of Patents Filed	No. of Products Developed	No. of Project Submitted to Funding Agencies	No. of Projects Sanctioned by Funding Agencies	No. of Events Conducted	No. of Technology Transfers Made	No. of Incubations/ Startups Initiated
13	Machine Learning Technologies for Societal Problems	Dr. K. Martin Sagayam	9	20	45	2	2	2	-	5	-	-
14	Satellite and GIS Application Mission	Dr. Nesasudha. M	9	45	11	-	-	2	2	2	1	-
15	Smart Vehicle Mission	Dr. F. T. Josh	7	274	29	1	-	1	1	1	-	-
16	Drone Technology for Agricultural Mission	Dr. Aldin Justin	10	120	8	-	-	2	-	2	-	-
17	Smart Technology for Precision Farming	Dr. R. Augustine	6	25	4	-	-	-	-	-	-	-
18	Technology Mission for Food Security	Er. Dayanand Peter	8	32	-	-	-	-	1	-	-	-
19	Robotics in Everyday Life Mission	Dr. Subathra	5	50	3	1	1	2	-	5	-	1
20	Water Treatment and Desalination Mission	Dr. S. Kavitha	8	125	141	5	3	4	1	5	1	2
21	Small Satellite Technology Mission	Dr. Ajith Raj	5	110	3	-	1	-	-	1	-	-
22	Data Analytics & Block Chain Mission	Dr. R. Priscilla Joy	10	140	10	-	-	1	-	3	-	-
23	Stem Cell Research Mission	Dr. Annie John	3	6	-	-	-	-	-	-	-	-

S. No	Technology Mission	Name of the Leader	No. of Faculty Members	No. of Student Members	No. of Papers Published	No. of Patents Filed	No. of Products Developed	No. of Project Submitted to Funding Agencies	No. of Projects Sanctioned by Funding Agencies	No. of Events Conducted	No. of Technology Transfers Made	No. of Incubations/ Startups Initiated
24	Nanotechnology For Healthcare & Vaccinology Mission	Dr. Muthu Vijayan Enoch I V	12	72	40	-	2	4	-	2	-	-
25	Medical Devices Mission	Dr. P. Subha Hency Jose	12	86	46	3	3	4	1	2	-	-

3. Activities through Ministry of Education's Innovation Cell for incubation and startups in thematic areas of SDGs - integrate sustainability and innovation into the curriculum, directly aligning with the Sustainable Development Goals (SDGs) by fostering an environment of creativity, entrepreneurship, and social responsibility among students.

Link: https://karunya.edu/kids

SDG-Aligned Objectives and Practices

Fostering Innovation and Entrepreneurship:
KIDS aims to inculcate students with the knowledge and skills necessary for invention, innovation, and the incubation of startups, supporting SDG 8 (Decent Work and Economic Growth) and SDG 9 (Industry, Innovation, and Infrastructure).

Revitalized Curriculum for Sustainable Development:
The curriculum revision emphasizes product development and industry practices, encouraging students to tackle projects in water, food, healthcare, and renewable energy – areas crucial to achieving SDGs 2 (Zero Hunger), 6 (Clean Water and Sanitation), 3 (Good Health and Well-being), and 7 (Affordable and Clean Energy).

Practical and Socially Relevant Education:
Through the integration of digital and interactive teaching methods, including virtual laboratories and fieldwork in rural areas, KIDS enhances the quality of education (SDG 4) and addresses issues vital for community development and sustainability.

Encouraging Active Participation in Innovation:
Students are motivated to engage in Hackathons, seminars, workshops, and competitions to cultivate skills in product design and development, echoing the innovative spirit of SDG 9. In implementing KIDS, KITS not only adheres to the educational mandates of MHRD, UGC, and AICTE but also actively contributes to the global agenda of sustainable development, preparing students to become leaders in innovation and sustainability.

Sl. No	Incubated project list	Sustainable Development Goals (SDGs)
1	Healo Packs (An eco-friendly Packing)	SDG 12: Responsible Consumption and Production, SDG 9: Industry, Innovation and Infrastructure
2	Millets Chocolate (a supplement rich in high iron and vitamin B12 pearl millets)	SDG 3: Good Health and Well-being, SDG 9: Industry, Innovation and Infrastructure
3	A Herbal Product (Herb-Based Product to Prevent Nit Infestation)	SDG 3: Good Health and Well-being, SDG 9: Industry, Innovation and Infrastructure
4	Nex-Dynamics (An autonomous wheelchair which provides greater independence and mobility to people with physical disabilities to improve their lifestyle.)	SDG 3: Good Health and Well-being, SDG 9: Industry, Innovation and Infrastructure, SDG 11: Sustainable Cities and Communities
5	A Herbal Product (Extraction and Evaluation of Anti-Lice Efficacy of Sphaeranthus Indicus Linn for infestation of lice)	SDG 3: Good Health and Well-being, SDG 9: Industry, Innovation and Infrastructure
6	Automatic Knee Massager (A smart automatic massager that not only massages your joint for pain relief but also measures any imminent risks, spo2 level, daily steps and has coils that cool down the joint in case of any swelling.)	SDG 3: Good Health and Well-being, SDG 9: Industry, Innovation and Infrastructure
7	AI-powered High-performance Mini PC with Liquid Cooling	SDG 3: Good Health and Well-being, SDG 9: Industry, Innovation and Infrastructure, SDG 11: Sustainable Cities and Communities
8	BIOSPARE (developing bionic spares for all organs, ensuring they are affordable and accessible to anyone.)	SDG 3: Good Health and Well-being, SDG 9: Industry, Innovation and Infrastructure
9	Edible Cutlery (Eradicate the consumption of microplastics with a suitable alternative by the presence of one-time-use cutlery)	SDG 3: Good Health and Well-being, SDG 9: Industry, Innovation and Infrastructure
10	Baby Bites (procure sugar substitutes such as the natural sweetening component found in Monk fruits, Miracle fruit, Katemfe fruit for baby foods)	SDG 3: Good Health and Well-being, SDG 9: Industry, Innovation and Infrastructure
11	Banana- Cellulose Based Bio composites	SDG 3: Good Health and Well-being, SDG 7: Affordable and Clean Energy, SDG 9: Industry, Innovation and Infrastructure
12	UV object sanitizer	SDG 3: Good Health and Well-being, SDG 9: Industry, Innovation and Infrastructure

Sl. No	Incubated project list	Sustainable Development Goals (SDGs)
13	Tendon Tissue Engineering in preclinical Sheep model	SDG 3: Good Health and Well-being, SDG 9: Industry, Innovation and Infrastructure, SDG 15: Life on Land
14	Advanced Passive Cooling Solutions	SDG 3: Good Health and Well-being, SDG 9: Industry, Innovation and Infrastructure, SDG 11: Sustainable Cities and Communities
15	Drones and Robotics for environmental applications	SDG 9: Industry, Innovation and Infrastructure, SDG 15: Life on Land
16	Block chain and cyber security for governance	SDG 15: Life on Land, Peace, SDG 16: Justice and Strong Institutions
17	Telegram sentinel monitoring system for TN police	SDG 15: Life on Land, Peace, SDG 16: Justice and Strong Institutions
18	Social media targeted cybercrimes for TN police	SDG 15: Life on Land, Peace, SDG 16: Justice and Strong Institutions
19	Virtual repairing system in a satellite (Repairon)	SDG 9: Industry, Innovation and Infrastructure, SDG 11: Sustainable Cities and Communities, SDG 7: Affordable and Clean Energy
20	Rapha- A medi solution venture	SDG 3: Good Health and Well-being, SDG 9: Industry, Innovation and Infrastructure, SDG 15: Life on Land

4. RURAL AGRICULTURAL WORK EXPERIENCE (RAWE)

To reorient graduates of agriculture and allied subjects for ensuring and assuring employability and develop entrepreneurs for emerging knowledge intensive agriculture, the component envisages the introduction of the program as an essential prerequisite for the award of degree to ensure hands on experience and practical training. These experiences enrich their knowledge on climate science and environmental sustainability. There are two components:

I. Rural Agricultural Work Experience (RAWE)

II. Agro-Industrial Attachment and Plant Clinic (AIA)

- The Rural Agricultural Work Experience (RAWE) helps the students primarily to understand the rural situations, the status of agricultural technologies adopted by farmers, prioritize the farmer's problems and develop skills & attitude of working with farm families for overall development in rural areas.
- The students will undertake this program during the seventh/eighth semester for a maximum duration of 20 weeks with a weightage of 0+20 credit hours in two parts namely RAWE and AIA. RAWE will consist of general orientation and on campus training by different faculty members followed by village attachment/unit attachment in University/ College / KVK or a research station.
- Under AIA, the students would be attached with the agro-industries to get experience of the industrial environment and working. Due weightage in terms of credit hours will be given depending upon the duration of the stay of students in villages/ agro industries.
- At the end of RAWE & AIA, the students will be given one week for project report preparation, presentation and evaluation. The students would be required to record their observations in field and agro-industries daily and will prepare their project report based on these observations.

EXPERENTIAL LEARNING PROGRAMME (ELP)

The Experiential Learning Programme (ELP) is designed to provide hands-on, real-world experience to students through active participation in production, processing, and agribusiness activities. It bridges the gap between theoretical knowledge and practical application by engaging students in project-based learning. This programme fosters entrepreneurial skills, decision-making ability, teamwork, and professional competence. Students are exposed to various enterprises such as seed production, food processing, nursery management, biocontrol agents, sericulture, mushroom production, and value addition of agricultural produce. The module encourages self-employment and

prepares students to take on leadership roles in the agriculture sector.

ELP 01 SOIL, PLANT, AND WATER TESTING SERVICES

To increase productivity and reduce the cost of production, timely advice is necessary. For scientific application of fertilizers and to understand the plant health, soil water and plant analysis are indispensable. Through the module appropriate training on soil testing, water quality assessment and plant analysis will be given. This in turn will help students to give recommendations to farmers based on the test result. Thus, farmers will be guided to apply fertilizers based on the results of the testing. This ensures soil quality and crop growth and plant health.


ELP 02 ORGANIC PRODUCTION AND COMPOSTING TECHNOLOGY

The module equips the students with the basic concept of organic farming and organic farming practices. Students will learn about the organic inputs and methods of organic crop cultivation. Students will also be equipped with various organic standards, agencies and certification for organic farming.


ELP 03 COMMERCIAL FLORICULTURE AND LANDSCAPING

Commercial floriculture and landscaping deals with the cultivation of flowers, foliage, climbers, trees. shrubs, cacti, succulents, etc., and with their marketing and production of value-added products from them". There is an increasing demand for indoor plants and other ornamental plants in urban areas. Similarly, there is a huge demand for dry flower products in the export market. Through this module, the undergraduate students are trained to propagate the ornamental plants and supply quality planting materials to the public and create value added products with the practical knowledge acquired over the previous years of their studies

ELP 04 COMMERCIAL NURSERY MANAGEMENT AND PROTECTED CULTIVATION

Quality planting material is one of the most essential inputs for crop production, particularly with reference to horticulture crops which are known for high productivity. Different types of planting materials like seeds, bulbs, rhizomes, corms, suckers and vegetative propagated buds, grafts and layers etc., are used, which may carry sometime virus particles with them. Hence, production of planting material under disease free Phyto-sanitary conditions is vital. Otherwise, anticipated & the potential output cannot be achieved. Hence in the module, the students will be trained on the production of quality plant materials for propagation.

ELP 05 PRODUCTION TECHNOLOGY FOR BIO-AGENTS AND BIOFERTILIZERS

In India excessive use of high-cost inputs like chemical fertilizers had bought impressive gains in food production but a destruction and continuous manipulation of soil including removal of nutrients and depleting microbial life. Entire dependence of chemical fertilizers in crop production is threatening soil biological health due to misappropriate supplement of nutrients. There is a huge decline in soil quality due to very low soil microbial populations which in turn slow down the rates of microbial-mediated decomposition of organic matter and nutrient cycling. Biocontrol agents play an important role in improving plant health in the world which includes microbes and insects [parasitoids, predators]. These biocontrol agents are potentially replacing harmful pesticides, leading to non-chemical method of management of pest and diseases by plant pathogens, improving plant immunity, and/or modifying the environment through the effects of beneficial microorganisms, compounds, or healthy cropping systems. With the increased need and awareness of integrated pest management concepts among the farmers, there is increased emphasis on the utilization of biocontrol agents for the management of pests.

Though their demand is increasing, yet their availability is far from sufficient. They are environmentally safe, cost-effective, sustainable, and can be readily incorporated into integrated pest management (IPM) programs. Entomopathogenic fungi are used as biopesticides in ecological farming as a safe alternative to toxic chemical insecticides which have immense potential in managing pests in agriculture because of their broad host range. This learning will ensure the students develop professional skills and knowledge through hands-on experience in liquid biofertilizer production, mass production techniques of biocontrol agents. Thereby students can gain confidence to start their own enterprise and become entrepreneurs in biofertilizer manufacturing.


ELP 06 MUSHROOM CULTIVATION TECHNOLOGY

Students will learn the facilities required for construction of mushroom shed, cultivation room/ structure and disinfection, maintenance of aseptic condition. Students will be trained in the cultivation techniques for oyster mushroom and milky mushroom from procurement of mother culture to harvesting. Students will be taken for visits to commercial mushroom production unit to understand how a mushroom enterprise is run. Training on value added processing - Grading, packing - marketing and cost economics of mushroom culture will also be imparted to the students.


ELP 07 COMMERCIAL BEEKEEPING

Beekeeping (Apiculture) is an economically viable technology for agricultural diversification. It needs less space with low investment but fetches quick returns and generates employment opportunities. It can be done in farmlands to homestead areas, and it can be practiced by women, men, children, farmers, unemployed youths, and those without any land holdings. Students can enterprise in beekeeping by utilizing their leisure time to earn money. However, adequate knowledge and skills are required for pursuing beekeeping as an enterprise. Hence students will be trained in all aspects of beekeeping from familiarizing themselves with different bee species, site selection, and rearing honeybees to harvesting and marketing of hive products viz., honey, wax, venom, propolis, pollen, and their value-added products. Students will also be trained in preparing project proposals

for a bank or government agency.

ELP 08 AGRIBUSINESS MANAGEMENT

Agribusiness management is the application of business management principles to the agricultural industry. It involves managing agricultural enterprises. including production. marketing, and processing of agricultural products. This module facilitates the students with e-commerce websites development called a B2C business model, wherein the sellers can sell their products/services via app. Students are provided with platforms to organize the training and workshops.

ELP 09 BROILER PRODUCTION TECHNOLOGY

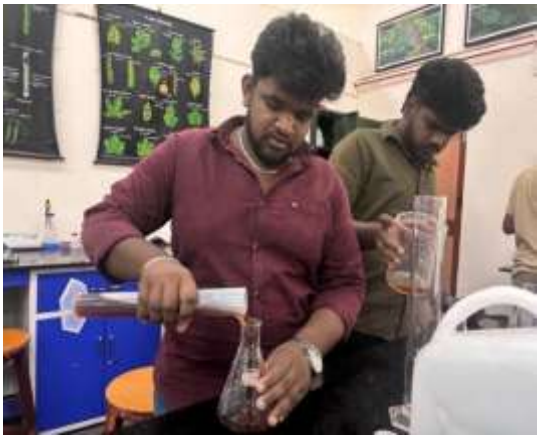
The module aims at creating entrepreneurship opportunities for the students and empowering them to set up their own business in Poultry. Students will be trained in how to take care of and handle the birds such as proper feed and vaccinations are also carried out by the students. Through this hands-on training coupled with theoretical backup and expertise from the professors the students look forward to a fruitful semester of learning.


ELP 10 FOOD PROCESSING

Post-Harvest Technology is a sunrise sector which is gaining importance nowadays because of its role in reducing post-harvest loss and its capability to meet the food requirement of growing population.


ELP 11 PRODUCTION TECHNOLOGY OF BIOCONTROL AGENTS

This module provides comprehensive knowledge and hands-on skills related to the production, formulation, quality control, and application of biocontrol agents used in sustainable agriculture. It covers the biological characteristics of key microbial agents (such as *Trichoderma*, *Pseudomonas*, *Bacillus*, *Beauveria*, and *Metarhizium*), their modes of action, mass multiplication techniques, carrier-based and liquid formulations, and regulatory guidelines. Emphasis is placed on eco-friendly plant protection strategies, integration into integrated pest management (IPM) systems, and entrepreneurship opportunities in bio-input production.

ELP 12 COMMERCIAL SERICULTURE

This module imparts practical and theoretical knowledge of sericulture as a profitable agro-based enterprise. It covers the biology and rearing of silkworms, mulberry cultivation, pest and disease management, and post-cocoon processing techniques. Students will learn about the different types of silk (mulberry, tasar, eri, muga), rearing practices under various agro-climatic conditions, and the economics of sericulture. Emphasis is placed on modern technologies, government schemes, and entrepreneurship opportunities in the silk industry.


ELP 13 CROP PRODUCTION AND PROCESSING OF TURMERIC

This module provides comprehensive knowledge and practical skills related to the scientific cultivation and post-harvest processing of turmeric (*Curcuma longa*). It covers agro-climatic requirements, improved varieties, seed material selection, land preparation, nutrient and water management, pest and disease control, and harvesting techniques. The processing segment includes cleaning, boiling, drying, polishing, and value addition. Special focus is given to organic cultivation, quality standards, storage, and marketing strategies. The module equips students to engage in commercial turmeric production and value chain development for income generation and entrepreneurship.


ELP 14 CROP PRODUCTION AND STORAGE OF SMALL ONION

This module focuses on the scientific production and post-harvest management of small onion (*Allium cepa* var. *aggregatum*), an important commercial vegetable crop. It covers climate and soil requirements, variety selection, propagation methods, nutrient and irrigation management, pest and disease control, harvesting, and yield optimization techniques. The module also emphasizes post-harvest handling, grading, curing, and scientific storage methods to minimize losses and extend shelf life. Students will gain insights into market trends, cost-effective production practices, and entrepreneurship opportunities in small onion cultivation and storage.


5. Project based and skill-based learning and assessment:

The knowledge and literacy of the environmental sustainability courses are assessed by project based and skill-based assessment. The guidelines are given in Policy on Blended Learning

- Internal Assessment 3 shall be a Project based or skill based assessment.
  - The evaluation for the students shall be based on testing of skills related to the course through project demonstration and presentation.
  - The HoDs shall prepare the Rubrics for the Assessment and the marks shall be awarded based on these rubrics

An open house shall be organized by the department before or after Internal Assessment 3 displaying the outcome of the project based learning through Products/Prototype/Posters/Video presentations.

Link: https://www.karunya.edu/iqac/sustainability