

**SELF STUDY REPORT FOR  
B.Tech (Food Technology)**



**SUBMITTED TO**

**Indian Council of Agricultural Research, Krishi Bhawan, New Delhi.**

**SUBMITTED BY**

**College of Agricultural Engineering & Post Harvest Technology**

**(Central Agricultural University, Imphal, Manipur)**

**Ranipool, Sikkim**

**2021**

## PREFACE

India faced the challenge of providing food security to millions of its people soon after independence. The Research and Development initiatives taken by the Government of India resulted in the 'Green revolution' in the late 60s and early 70s. As a result of 'Green revolution' and various other efforts, India has made significant achievement through production of food grains, fruits and vegetables, milk, livestock production, fish production etc. and gained self-sufficiency in most of the areas of Indian Agriculture. However, contribution of engineering inputs (irrigation, soil and water conservation, farm mechanization, processing, reduction of harvest and post harvest losses, processing of milk, meat and fish and development of their products, farm structures, housing / shelter for livestock, fish ponds, utilization of renewable energy sources, utilization of agricultural, livestock & fish waste and by-product, environment and agricultural interaction etc.) in these efforts were not optimum. But considering the nutritional security, livelihood security, economic sustainability and high generation of employment, a need was felt to develop and provide these engineering inputs.

Keeping in view the high potential of applications of agricultural engineering and post-harvest technological interventions in improving the agricultural scenario of NEH region and to address to the issues of shortage of trained human resource in this discipline, the College of Agricultural Engineering and Post Harvest Technology (CAEPHT) was established in May 2006 by Central Agricultural University (CAU), Imphal at Ranipool, Gangtok (Sikkim). Initially, B.Tech. Agril. Engg. Programme, was started at the time of establishment in 2006. The college has marched ahead, to offer **two B.Tech.** (B.Tech. Agri. Engg. and B.Tech. Food Tech.), **five M.Tech.** (Farm Power & Machinery, Soil & Water Engg., Processing & Food Engg., Irrigation and Drainage Engineering and Renewable Energy Engineering) and **three PhD** (Farm Power & Machinery, Soil & Water Engg. and Processing & Food Engg.) degree programme.

**At B.Tech level, students are admitted only from all the State of NEH.** Few seats are filled on all India bases through ICAR quota. The quota of various States is fixed. The State Governments recommend students (on the basis of competitive examinations

within their state) for admission. Similarly ICAR nominate (on the basis of all India competitive examination) students for their quota. At M.Tech and Ph. D. level, students are admitted on the basis of all India competition conducted by the University. Few seats are filled through ICAR quota. ICAR nominate (on the basis of all India competitive examination) students for their quota.

Students of this college have excelled not only in curriculum but also in extracurricular activities and national level competitive examinations and the college is making continuous efforts to improve the quality of education offered here. The ICAR has introduced the procedure of accreditation, which help in assessing facilities available to impart the quality education offered by the college. The college was accredited by ICAR Peer Review committee for a period of **five years (up to March, 2021)**. Since the college is due for further accreditation, the present report provides all the necessary information about the college activities performed during **last five years**.

The University Level Task Force and the college level Task Force have done a great job in compiling information and bringing out this report to be submitted to Accreditation Board of ICAR. I convey my heartfelt thanks to all those, who are involved in preparation of this report.

**(P. P. Dabral)**  
**Dean**

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## **6.4. Self Study Report for the Programme**

### **Self-Study Report for the Degree Programme, College of Agricultural Engineering and Post Harvest Technology, Ranipool, Gangtok, Sikkim**

For the college offering degree programme as per recommendations of 5th Dean's Committees of ICAR/VCI/BSMA

#### **6.4.1. Brief History of the Degree Programme:**

The College of Agricultural Engineering and Post Harvest Technology (CAEPHT) was established on 20th May, 2006 as one of the constituent colleges of Central Agricultural University, Imphal, Manipur. It is situated at Ranipool, Gangtok on National Highway 10 connecting Siliguri in West Bengal to Gangtok, the capital of Sikkim State. The campus of college is spread over an area of 7.71 ha. The total campus is located in mostly hilly terrain and sloppy and valley land at an altitude of approximately 914.4 m. (3000 ft.) above the mean sea level. Two rivers, namely Rani-Khola and Basuk-Khola, touch the college boundary towards the east side while the national highway NH- 10 is towards the west side of college campus. The college building, situated in the terraces and valleys and surrounded by rivers, provide an ideal atmosphere for academic and research activities.

The CAEPHT, Ranipool, Gangtok, Sikkim imparts education in different branches of Agricultural Engineering. The College started its first academic programme i.e., 4-year B. Tech. (Agricultural Engineering) programme from academic session 2006-07 with intake capacity of 20 students. Afterwards, a new degree programme was initiated as B.Tech in Food Process Engineering during 2010 with intake capacity of 19 students. As per the ICAR Policy, this Degree Programme was renamed as B.Tech in Food Technology during 2012 and this programme is running since then.

The mission, vision, mandate, goal objectives and thrust areas of the college is given below.

#### **Mandate of the Institution**

- Shortage of trained manpower in discipline(s) of agricultural engineering and post-harvest technology

- Natural resource management, farm mechanization and post-harvest technology including processing, value addition and creation of agro-industries etc.

### **Mission**

- To be a centre of excellence in teaching, research and extension education in the discipline of agricultural engineering and post-harvest technology so as to promote farm mechanization, reduce drudgery in agricultural operations and losses in post-harvest management and value addition to crops produced in NEH region.

### **Vision**

- In accordance with the vision of CAU, Imphal the vision of CAEPHT is to produce world class professionals who are equipped to meet the demands of global outfit, have analytical abilities and entrepreneurship for making career of self employment and as contributors, to livelihood and food/nutritional security.

### **Objectives**

- To establish and develop excellent academic facilities for offering undergraduate and postgraduate education in discipline of agricultural engineering and post-harvest technology, appropriate to various states of NEH region in particular and country in general.
- To impart quality education so as to produce globally competitive graduates and post graduates in areas of agricultural engineering and post-harvest technology including inter disciplinary area so that confident and capable human resource, suitable for working as scientists, academics, managers, entrepreneurs etc., could be developed.
- To establish specialized research laboratories fitted with state of art machineries equipment and instruments for taking up basic and applied research by the scientists/teachers and post-graduate students and experiential learning facilities including pilot plants for hands on training of undergraduate students.
- To develop and demonstrate modern and mechanized farming system appropriate to NEH states which may help the farmers to improve their productivity and profitability while preserving and improving the environment.
- To develop need based improved agro-technologies and equipment for NEH region for household and on farm operations, post-harvest management and utilization of renewable sources of energy.

**Accomplishments:**

At B.Tech level, students are admitted only from all the State of NEH. Few seats are filled on all India bases through ICAR quota. The quota of various States is fixed. The State Governments recommend students (on the basis of competitive examinations within their state) for admission. Similarly ICAR nominate (on the basis of all India competitive examination) students for their quota. The intake capacity, number of students admitted, number of students graduated number of fellowship received by the students in various academic years are given in following two tables.

**Table 1: Performance of the students during 2015-2020**

Sl. No.	Year	Intake capacity	No. of Student Admitted	No. of Student Graduated	No. of Students receiving NTS during the academic year (First year to final year)	No. of Students receiving Univ. Merit Scholarship/ Univ. Institutional Fellowship	Any other Scholarships during the academic year (First year to final year)
1.	2015-16	20	09	05	12	03	-
2.	2016-17	20	09	07	03	02	-
3.	2017-18	19	09	09	03	02	9, State Scholarship
4.	2018-19	19	09	06	05	03	02, Ishan Uday (UGC) 9, State Scholarship
5.	2019-20	22	10	10	04	04	02, Ishan Uday (UGC) 02, State Scholarship

**Table 2: The total no. of students of B.Tech Food Technology (1<sup>st</sup> year, 2<sup>nd</sup> year, 3<sup>rd</sup> year & 4<sup>th</sup> year) available during various academic years given below.**

Year	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	Total no of student	Total scholarship
2015-16	14	06	09	07	36	15

2016-17	09	11	06	09	35	05
2017-18	10	6	10	6	32	14
2018-19	09	10	06	10	35	19
2019-20	12	07	09	05	33	12

### 6.4.2 Faculty Strength

College of Agricultural Engineering and Post Harvest Technology (CAEPHT) offer B. Tech Food Technology in addition to B. Tech Agricultural Engineering program. **There is no separate College of Food Technology. Hence, all the departments, faculty and laboratories as required for a separate college under fifth deans' committee recommendations are not available. However, the faculties, laboratories and other facilities of CAEPHT are being utilized for smooth running of B. Tech Food Technology program.**

As per the Fifth Dean Committee, Five Professors, Ten Associate Professors and Thirty One Assistant Professors are needed to teach and guide the students of B.Tech Food Technology, M.tech Food Technology and Ph.D.Food Technology. We are offering only B.Tech (Food Technology). At this College the following Faculty members were involved in teaching and guiding the students of B.Tech Food Technology during 2015-2020.

**Table 3: Details of Faculty strength**

Sl. No.	Faculty associated with Food Technology programme	Permanent	Guest faculty	Total
1.	Professor	2	1(on contract) 1(as guest)	4
2.	Associate Professor	1	1(as guest)	2
3.	Assistant Professor	22	2(as guest) 3 (sister organization- COH) 3 (on Contract)	30

\*the names of various faculties (permanent, on contract, from sister organization, guest etc.) their qualification and various courses taught by them is given below.

\*\* All the faculty were assigned the responsibility for the multiple programme (Bachelor level, PG level and Ph. D Levels)



**Table 4: Information regarding faculties, their qualification and various courses of B.Tech (Food Technology) Programme**

Area	(since 2015 to 2020)		
	Subject	Taught by	Qualification
<b>Food Process Technology</b>	Fundamentals of Food Processing	Dr. B. K. Singh (Assistant Professor)	Ph.D
	Processing Technology of Cereals	Dr. (Late) A. I. Singh (Assistant Professor)	Ph.D
		Dr. R. P. Misra (Professor) <b>On Contract</b>	Ph.D
	Processing Technology of Legumes and Oilseeds	Dr. (Late) A. I. Singh (Assistant Professor)	Ph.D
		Dr. Rakesh Kumar Raigar (Assistant Professor)	Ph.D
	Processing Technology of Fruits and Vegetables	Dr. Sujata Jena (Associate Professor )	Ph.D
	Processing Technology of Liquid Milk	Dr. R. K. Raigar (Assistant Professor)	Ph.D
	Processing Technology of Dairy Products	Dr. R. K. Raigar (Assistant Professor)	Ph.D
	Processing Technology of Beverages	Dr. Meinam Chanchan (Assistant Professor)	Ph.D
		Dr. Sujata Jena (Associate Professor)	Ph.D
	Processing of Spices and Plantation Crops	Dr. Meinam Chanchan (Assistant Professor)	Ph.D
		Dr. Sujata Jena (Associate Professor) Dr. Sujata Upadhyay, <b>Guest</b>	Ph.D Ph.D
	Processing of Meat and Poultry Products	Dr. B. K. Singh (Assistant Professor)	Ph.D
	Processing of Fish and Marine Products	Dr. B. K. Singh (Assistant Professor)	Ph.D
	Bakery, Confectionery and Snack Products	Dr. Said P. P. (Assistant Professor)	Ph.D
Food Packaging Technology and Equipment	Dr. (Late) A. I. Singh (Assistant Professor)	Ph.D	
	Dr. R. K. Raigar (Assistant Professor)	Ph.D	
Sensory Evaluation of Food Products	Dr. Said P. P. (Assistant Professor)	Ph.D	
Fundamental of food technology	Dr. R. P. Misra (Professor)	Ph.D	
	Dr. Wazid Ali Khan (Associate Professor) <b>Guest</b>	Ph.D	
Product Development	Dr. Wazid Ali Khan (Associate	Ph.D	

	and Formulation (As per fourth Dean's Committee recommendation)	Professor) <b>Guest</b> Er. Swati Patil, <b>On Contract</b>	M.Tech
	Cereal Processing (As per fourth Dean's Committee recommendation)	Er. Swati Patil, <b>On Contract</b>	M.Tech
	Processing of Milk and Milk products (As per fourth Dean's Committee recommendation)	Er. Swati Patil, <b>On Contract</b>	M.Tech
	Food Processing Equipment II (As per fourth Dean's Committee recommendation)	Er. Swati Patil, <b>On Contract</b>	M.Tech
	Legume and oil seeds technology (As per fourth Dean's Committee recommendation)	Er. Swati Patil, <b>On Contract</b>	M.Tech
	Specialty food(As per fourth Dean's Committee recommendation)	Er. Swati Patil, <b>On Contract</b>	M.Tech
<b>Food Safety and Quality Assurance</b>	General Microbiology	Dr. D. Talukdar (Assistant Professor) <b>Sister Organization(COH)</b> Dr. S. Gurumayum (Assistant Professor)	Ph.D Ph.D
	Food Microbiology	Dr. D. Talukdar (Assistant Professor) <b>Sister Organization(COH)</b> Dr. S. Gurumayum (Assistant Professor)	Ph.D Ph.D
	Industrial Microbiology	Dr. D. Talukdar (Assistant Professor) <b>Sister Organization(COH)</b> Dr. S. Gurumayum (Assistant Professor)	Ph.D Ph.D
	Food Chemistry of Macronutrients	Dr. Said P. P. (Food Technology) Dr. B. Sharma (Assistant Professor)	Ph.D Ph.D
	Food Chemistry of Micronutrients	Dr. Said P. P. (Assistant Professor) Dr. B. Sharma (Assistant Professor)	Ph.D Ph.D
	Food Biochemistry and Nutrition	Dr. Sudip Das (Assistant Professor) <b>Sister Organization(COH)</b> Dr. B. Sharma (Assistant Professor)	Ph.D Ph.D
	Biochemistry	Dr. Y. Ranjana Devi (Assistant Professor)	Ph.D.
	Food chemistry I (As per fourth Dean's)	Dr. Y. Ranjana Devi (Assistant Professor)	Ph.D

	Committee recommendation)		
	Food chemistry II (As per fourth Dean's Committee recommendation)	Dr. Y. Ranjana Devi (Assistant Professor)	Ph.D
	Food Biotechnology	Dr. Amit Rai, <b>Guest</b> Dr. Mrs. Rai, <b>On Contract</b> Ms. Supriya <b>On Contract</b> Dr. S. Gurumayum (Assistant Professor)	Ph.D Ph.D M. Tech. Ph.D
	Food Additives and Preservatives	Dr. Said P. P. (Assistant Professor)	Ph.D
	Instrumental Techniques in Food Analysis	Dr. Said P. P. (Assistant Professor) Dr. B. Sharma (Assistant Professor)	Ph.D. Ph.D
	Techniques in Food Analysis	Dr. Y. Ranjana Devi	Ph.D.
	Food Plant Sanitation	Dr. B. K. Singh (Assistant Professor)	Ph.D
	Food Quality, Safety Standards and Certification	Dr. Sujata Jena (Associate Professor)	Ph.D
<b>Food Process Engineering</b>	Food Thermodynamics	Er. N. Devrani (Assistant Professor) Dr. B. K. Singh (Assistant Professor)	Ph.D Ph.D
	Fluid Mechanics	Dr. A. K. Vashisht (Associate Professor) Dr. Ghanshyam S. Y. (Assistant Professor)	Ph.D Ph.D
	Post Harvest Engineering	Dr. (Late) A. I. Singh (Assistant Professor) Dr. Sujata Jena (Associate Professor)	Ph.D Ph.D
	Heat and Mass Transfer in Food Processing	Er. N. Devrani (Assistant Professor) Dr. B. K. Singh (Assistant Professor)	Ph.D Ph.D
	Unit Operations of Food Processing-I	Dr. Sujata Jena (Associate Professor) Dr. Said P. P. (Assistant Professor)	Ph.D Ph.D
	Unit Operations of Food Processing-II	Dr. Said P. P. (Assistant Professor)	Ph.D
	Food Refrigeration and Cold Chain	Er. N. Devrani (Assistant Professor) Dr. B. K. Singh (Assistant Professor)	Ph.D Ph.D
	Food Storage Engineering	Dr. Sujata Jena (Associate Professor)	Ph.D
	Food Process Equipment Design	Dr. R. K. Raigar (Assistant Professor)	Ph.D
	Instrumentation and Process Control in Food Industry	Er. Rajiv Pradhan (Assistant Professor)	M.Tech
<b>Food</b>	Business Management	Dr P.K Srivastav Dean	Ph D

<b>Business Management</b>	and Economics	Dr. A. Devi (Assistant Professor)	Ph.D
	ICT Applications in Food Industry	Er. Rajiv Pradhan (Asst. Prof.) Er. Ph. Robart (Asst. Prof.)	M.Tech M.Tech
	Marketing Management and International Trade	Dr P.K Srivastav Dean Dr. A. Devi (Assistant Professor)	Ph.D
	Project Preparation and Management	Dr P.K Srivastav Dean Dr. A. Devi (Assistant Professor)	Ph.D
	Communication and Soft Skills Development	Dr. D. Roy (Asst. Prof.)	Ph.D
	Entrepreneurship Development	Dr P.K Srivastava Dean Dr. A. Devi (Assistant Professor)	Ph.D
<b>Food Plant Operations</b>	Student READY - Experiential Learning Programme - I	Dr. R. P. Misra (Professor)	Ph.D
		Dr. Sujata Jena(Associate Professor)	Ph.D
		Dr. B. K. Singh(Assistant Professor)	Ph.D
		Dr. Said P. P. (Assistant Professor)	Ph.D
		Dr. R. K. Raigar(Assistant Professor)	Ph.D
		Dr. (Late) A. I. Singh(Assistant Professor)	Ph.D
	Student READY - Experiential Learning Programme - II	Dr. R. P. Misra (Professor)	Ph.D
		Dr. Sujata Jena(Associate Professor)	Ph.D
Dr. B. K. Singh(Assistant Professor)		Ph.D	
Dr. Said P. P. (Assistant Professor)		Ph.D	
Dr. R. K. Raigar(Assistant Professor)		Ph.D	
Dr. (Late) A. I. Singh(Assistant Professor)		Ph.D	
Student READY - Industrial Tour			
Student READY - Research Project	Dr. R. P. Misra (Professor)	Ph.D	
	Dr. Sujata Jena(Associate Professor)	Ph.D	
	Dr. B. K. Singh(Assistant Professor)	Ph.D	
	Dr. Said P. P. (Assistant Professor)	Ph.D	
	Dr. R. K. Raigar(Assistant Professor)	Ph.D	
Dr. (Late) A. I. Singh(Assistant Professor)	Ph.D		
Student READY - Seminar	Dr. R. P. Misra (Professor)	Ph.D	
Student READY ó Internship/In-Plant Training			
<b>Basic Engineering</b>	Engineering Drawing and Graphics	Dr. S. R. Yadav (Asst. Prof.)	Ph.D
		Dr. Ghanshyam S. Y. (Asst. Prof.)	Ph.D
	Basic Electrical Engineering	Er. Nandita Sen (Asst. Prof.) Mr. S. M. Kamaruzzaman (Asst. Prof.)	M.tech M.Tech
	Workshop Technology	Er. S.K. Chauhan (Asst. Prof.)	M.Tech
Computer Programming	Er. Ph. Robart (Asst. Prof.)	M.Tech	

	and Data Structures	Er. Rajiv Pradhan (Asst. Prof.)	M.Tech
	Basic Electronics Engineering	Er. Rajiv Pradhan (Asst. Prof.)	M.Tech
<b>Basic Sciences and Humanities</b>	English Language	Dr. D. Roy (Asst. Prof.)	Ph.D
	Engineering Mathematics-I	Dr. Pankaj Shrivastava (Professor) <b>Guest</b> Dr. S. K. Mehar (Asst. Prof.)	Ph.D Ph.D
	Crop Production Technology	Dr. A. B. Sherpa (Asst. Prof.)	Ph.D
	Engineering Mathematics-II	Dr. Pankaj Shrivastava (Professor) <b>Guest</b> Dr. S. K. Mehar (Asst. Prof.)	Ph.D Ph.D
	Environmental Science and Disaster Management	Dr. B. C. Khusre (Professor) Dr. Chakpram Birendrajit (Asst. Prof.) Dr. Ph. Bhumita (Asst. Prof.) <b>Sister Organization</b> Dr. D. Talukdar (Asst. Prof.) <b>Sister Organization</b>	Ph.D Ph.D Ph.D Ph.D
	Statistical Methods and Numerical Analysis	Mrs. T. Loidang Chanu (Asst. Prof.)	M.Sc

### 6.4.3 Technical and Supporting Staff

**Table: 5. Strength of Technical & Supporting Staff: Available posts and actual filled**

Sl. No.	Name of the Post	No. of Post	Actual Filled	Vacancy
<b>A. Dean office</b>				
1.	Sr. Stenographer	01	00	01
2.	Computer Operator	01	01	00
3.	MTS	01	01	00
<b>B. Establishment</b>				
1.	Asstt. Registrar(Estt.)	01	00	01
2.	Head Assistant	01	01	00
3.	Assistant	01	01	00
4.	UDC	01	00	01

5.	MTS	01	01	00
<b>C.</b>	<b>Store and Purchase</b>			
1.	UDC	02	01	01
2.	MTS	01	01	00
<b>D.</b>	<b>Account Section</b>			
1.	Assistant Comptroller	01	00	01
2.	Accountant	02	01	01
3.	Account Assistant/ Cashier	02	02	00
4.	UDC	01	01	00
5.	LDC	01	01	00
5.	MTS	01	01	00
<b>F.</b>	<b>Academic Section</b>			
1.	Assistant Registrar (Acsad)	01	00	01
2.	UDC	02	01	01
3.	MTS	01	01	00
<b>G.</b>	<b>Engineering Section/ Estate section</b>			
1.	Assistant Engineer( Civil)/ Assistant estate officer- Civil	01	01	00
2.	Junior Engineer- Civil	01	01	00
3.	Junior Engineer- Electrical	01	00	01
4.	UDC	01	01	00
5.	Electrician	01	01	00
6.	Carpenter	01	01	00
7.	Plumber	01	01	00
8.	MTS	01	01	00
<b>H.</b>	<b>Transport Section</b>			
1.	Driver	05	04	01
2.	Handyman(MTS)	02	02	00
<b>I.</b>	<b>Library Staff</b>			
1.	Librarian	01	00	01
2.	Sr. Library Assistant	01	01	00

3.	Library Asstt.	01	01	00
4.	MTS	03	03	00
<b>J.</b>	<b>Students Welfare</b>			
1.	Student Welfare Officer	01	<b>00</b>	<b>01</b>
<b>K.</b>	<b>Hostel Staff</b>			
1.	Cook (MTS)	03	03	00
<b>L.</b>	<b>Technical Staff</b>			
1.	Field-cum-Lab assistant	17	11	06
2.	Horticulture Assistant	01	01	00
3.	Livestock Assistant /Farm Assistant	05	04	01
<b>M.</b>	<b>Medical Unit</b>			
1.	Medical Officer	01	01	00
2.	Compounder	01	01	00
3.	Female Health Worker	02	02	00
4.	Male Health Worker	01	01	00
<b>N.</b>	<b>Security</b>			
1.	Security Guard	02	02	00
2.	Chawkidar(MTS)	02	02	00
<b>O.</b>	<b>MTTC/VTC</b>			
1.	Account Assistants	02	02	00
	<b>ATTIC</b>			
1.	MTS	01	01	00
	<b>Guest House</b>			
1.	MTS	01	01	00
	<b>FMPE</b>			
	UDC	01	01	00
<b>P.</b>	<b>MTS(Multi-tasking staff) in various departments</b>	22	22	00
<b>Total</b>		<b>107</b>	<b>88</b>	

#### 6.4.4 Classrooms and Laboratories

07 well-equipped classrooms for UG (Including AE and FT) and 05 well-equipped classrooms for PG are made available with this college. There are 02 smart class rooms also for UG and PG Students. These are well equipped with audio-visual aids for effective teaching. Different department of this college also have well-equipped laboratories for conducting practical classes of the students. Since the laboratories are equipped with most of the instruments, it also enables staff of this college to carry out research.

**Table: 6. Class room available**

Class Room	Smart class room/interactive Board
UG 7 Nos.	Having Projector facility with Desktop
PG - 05 Nos.	--
English Lab (UG) .:=01 nos.	Having Projector facility with Desktop
Smart Class Room (UG & PG) =-02	Having smartboard and interactive board
<b>Total = 15</b>	

**Table: 7. Laboratories available**

Sl. No.	Name of the Laboratory
1.	<b>Food Engineering laboratory</b> (consisting of Food Process Technology unit and Food Product Development unit)(Area- 228.28m <sup>2</sup> )
2.	<b>Process Engineering laboratory</b> (consisting of unit operation lab, packaging unit etc.)(Area- 92.77m <sup>2</sup> )
3.	<b>Food Analysis laboratory</b> (consisting of Food Rheology and sensory unit, Food Bio-Technology unit and Food Analytics unit etc.) (Area-93.24 m <sup>2</sup> )
4.	<b>Agricultural Structures &amp; Environmental Control Laboratory Engineering laboratory</b> (consisting of Heat, Mass & Refrigeration ó Air Conditioning Unit)(Area- 80.71 m <sup>2</sup> )
5.	<b>Pilot Plant for Milk&amp; Milk Product Processing</b> including Dairy Technology Lab(Area-201.51m <sup>2</sup> )
6.	<b>Pilot Plant for Fruits and Vegetable</b> including Cottage scale soya paneer plant(Area- 124.03 m <sup>2</sup> )
7.	<b>Multi stage evaporator with aroma recovery system</b> (Area-20.9m <sup>2</sup> )
8.	<b>Shed for Feed and Fodder crusher and seed processing unit</b> etc.( 119.66 m <sup>2</sup> )
9.	<b>Mini Rice Mill</b> (Area 148.65m <sup>2</sup> )
10.	<b>Farmer's Produce Processing cum Skill Development Centre</b> (Area 265.26 m <sup>2</sup> )



	(consisting of Ginger & Turmeric Processing Plant ó Area 72 m <sup>2</sup> , Unit of Minimal Processing of Fruits and Vegetableó Area 17.84m <sup>2</sup> , Bakery unitó Area 23.78m <sup>2</sup> , Noodles unitó Area17.84 m <sup>2</sup> , Potato Chips unitóArea 17.84 m <sup>2</sup> , storeóArea 25.65 m <sup>2</sup> , kitchen óArea 17.84 m <sup>2</sup> , class roomóArea 27.87 m <sup>2</sup> , training hall óArea 44.6 m <sup>2</sup> )
11.	<b>Biochemistry Lab</b>
12.	<b>Microbiology Lab</b>
13.	<b>Thermodynamics &amp; Heat Engg. Lab</b>
14.	<b>Irrigation Drainage &amp; Fluid Mechanics lab</b>
15.	<b>Electrical , Electronics Engineering Instrumentation &amp; Process Control Lab</b>
16.	<b>Engineering Drawing Lab</b>
17.	<b>Workshop</b>
18.	<b>Computer Lab</b>
19.	<b>Language Lab (Under development)</b>
20.	<b>ATIC including Technology Transfer Lab</b>

### LABORATORIES UTILIZED IN THE PROGRAM



**Fig 1: Food Engineering Laboratory**



**Fig 2: Process Engineering laboratory**



**Fig 3: Food Analysis laboratory**



**Fig 4: Agricultural Structures & Environmental Control Laboratory Engineering laboratory**



**Fig 5: Fruit and Vegetable Plant Fig. Milk & Milk product Processing Plant**



**Fig 6: Ginger & Turmeric Processing Plant**



**Fig 7: Baking Oven Fig. Noodle making machine**

a) **Lists major Equipment:**

The laboratories are well equipped to conduct the practical/hands on training to the students with instruments, laboratory tables, basins, electrical and ventilations, adequate wooden furniture etc. The lists of instruments/ equipments available in the laboratories are furnished below:

**Table 8: Major Equipment in Processing & Food Engineering Department**

<ul style="list-style-type: none"> <li>• Steam Distillation set up</li> <li>• Fruit pulper</li> <li>• Feed mixer (planatory mixer, planatory mixer (vacuum jacketed), planatory mixer (heating jacketed), double cone mixer, Blender SVB, Cube Mixer, Lab Kneader, Powder Mixer, Agitator, Drum Hoop Mixer-SDHM, Lab mass mixer SLMM, horizontal main drive SHMD-A.C., Universal Gear)</li> <li>• Coconut tree climber</li> <li>• Coconut dehusker</li> <li>• Pasta Extruder</li> <li>• Essential Oil distillation Unit             <ul style="list-style-type: none"> <li>▪ Solid Liquid Extraction unit</li> <li>▪ Steam Distillation Set up</li> <li>▪ Simple batch distillation unit</li> </ul> </li> <li>• Refrigerated centrifuge with Micro processor</li> <li>• Rotary vacuum filter &amp; Leaf Filter</li> <li>• Refrigerated centrifuge CPR 24</li> <li>• Plate heat exchanger</li> <li>• Usha make Gerber Centrifuge</li> <li>• Usha make centrifuge separator</li> <li>• Vegetable Blancher</li> <li>• Vacuum Tray Dryer</li> <li>• General cycle refrigeration trainer</li> <li>• Heat transfer through lagged pipe apparatus</li> <li>• Heat transfer through composite walls apparatus</li> <li>• Mechanical heat pump trainer</li> </ul>	<ul style="list-style-type: none"> <li>• Vacuum Packaging Machine</li> <li>• Steam Jacketed cooking kettle</li> <li>• Butter churn</li> <li>• Vacuum oven</li> <li>• Vacuum Tray Dryer</li> <li>• Laboratory Pasteurizer</li> <li>• Shrink Packaging Machine Model-CP-2030</li> <li>• Laboratory homogenizer</li> <li>• Micro Pulverizer (hammer mill)</li> <li>• Feed and Fodder crusher</li> <li>• Feed Block Formation Machine</li> <li>• Food Extruder</li> <li>• Fruit and Vegetable Juice and paste Processing Plant</li> <li>• Boerner conical divider</li> <li>• Bucket elevator</li> <li>• Multipurpose grain mill</li> <li>• Super critical fluid extraction unit</li> <li>• Foot Sealer</li> <li>• Fermenter</li> <li>• Hand sealer</li> <li>• Electronics Grain Moisture Meter</li> <li>• Angle of Repose apparatus</li> <li>• Digital Humidity Sensor and Indicator</li> <li>• Hot Air Oven</li> <li>• Electronic weighing balance (2.2kg)</li> <li>• Electronic weighing balance ZSP-350 (300g)</li> <li>• Digital balance model ó(A-224) make Contech Capacity-220gm</li> <li>• Digital Precision Electronic Balance</li> <li>• Apparatus for thermal</li> </ul>
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<ul style="list-style-type: none"> <li>• Plate type heat exchanger</li> <li>• Recirculation type air conditioning trainer</li> <li>• Stefan Boltzmann apparatus</li> <li>• Thermal conductivity of insulating slabs by guarded hot plate method</li> <li>• Thermal conductivity of insulating powder</li> <li>• Micrometer Precise Thickness</li> <li>• Shrink Wrapping Machine</li> <li>• Aspirator/ Cyclone Separator</li> <li>• Automatic Foam Fill Seal packaging Machine</li> <li>• Rubber Roll Sheller</li> <li>• Rice Whitener/Polisher</li> <li>• Indented Cylinder Grader/ Separator</li> <li>• Vibratory Screen Grader</li> <li>• Freeze Dryer</li> <li>• Food texture analyzer</li> <li>• Rapid visco analyzer</li> <li>• BOD Incubator with shaker</li> <li>• Automatic Fibre Extraction system</li> <li>• Digital Refractrometer PAL</li> <li>• Laminar Flow</li> <li>• Fruit and Vegetable Plant</li> <li>• Milk Processing Plant</li> <li>• Multi stage evaporator with aroma recovery system</li> <li>• Cottage scale soya paneer plant</li> <li>• Seed processing plant</li> <li>• Modern rice mill (0.5 t/h capacity)</li> <li>• Mini Dal Mill</li> <li>• Milk analyzer Master Clasic</li> <li>• Oxygen and CO<sub>2</sub> Headspace Gas analyzer plus Flexible packaging kit</li> <li>• Microwave oven</li> <li>• Water Bath</li> <li>• Laboratory Spray Dryer</li> <li>• Cream Separator</li> </ul>	<ul style="list-style-type: none"> <li>conductivity of insulating powder</li> <li>• Convection apparatus (natural)</li> <li>• Convection apparatus (forced)</li> <li>• Concentric tube heat exchanger (finned tube type)</li> <li>• Concentric tube heat exchanger (plain tube type)</li> <li>• Emissivity measurement apparatus</li> <li>• Digital temperature meter</li> <li>• Electronics Socs Plus Automatic Three Place Solvent Extraction Apparatus (Soxlet)</li> <li>• Microscope-Ex-21 set Binocular Brand-OLYMPUS</li> <li>• Viscometer</li> <li>• Usha Make Centrifuge Separator</li> <li>• Usha Make Gerber Centrifuge (2nos)</li> <li>• Water Activity Meter</li> <li>• Samsung Freeze with stand</li> <li>• Water Purification System</li> <li>• Ginger Washing Machine</li> <li>• Vegetable Cutting Machine</li> <li>• Spice processing plant             <ul style="list-style-type: none"> <li>○ Ginger /Turmeric peeler cum polisher</li> <li>○ Garlic Bulb Breaking Machine</li> <li>○ Garlic Clove Flaking Machine</li> </ul> </li> <li>• Ginger Processing Machine (Complete Unit)</li> <li>• Turmeric Grinder</li> <li>• Potato Slicer</li> <li>• Vegetable Washing Machine</li> <li>• Complete unit of Potato Chips Machine</li> <li>• Complete Unit of Biscuits Making Machine</li> <li>• Complete Unit of Noodle Making Machine</li> <li>• Ginger Paste and Powder Making Machine</li> <li>• OTG Oven</li> </ul>
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<ul style="list-style-type: none"> <li>• Freeze Drier</li> <li>• Digital Satorious Infra-red Moisture Meter</li> <li>• pH meter</li> <li>• Chroma meter</li> <li>• Autoclave</li> </ul>	
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**Theory and practical batches for the Degree Programme:** The number of intake students is manageable due to limited number of seats.

**Table 9: Average number of students in theory and practical classes**

Sl. No.	Name of the degree programme	Batch of student in theory	Batch of student in practical
1.	B. Tech. (Food Technology)	Full strength	Full strength

The class rooms and laboratories are sufficient to meet course curricula requirement of the degree programme.

### 6.4.5 Conduct of Practical and Hands on Training

#### Theory and Practical batches for the Degree Programme

There are manageable number of students (Maximum 22) who are kept in one batch during Theory & Practical classes to ensure better delivery of information, encourage students' participation and active monitoring.

**We have provided practical as well as hands on training to students of various other universities, such as Sikkim University, CAU(COFT, COH), NIFTEM, Mizoram University etc. also.**

Year	B.Tech. ( Processing and Food Engineering)	
	Batch of students in theory class	Batch of students in practical class
2015-16	05	05
2016-17	07	07
2017-18	09	09
2018-19	06	06
2019-20	10	10
2020-21	05	05

### Short duration training/visit

During the course of study students also visited the following industries for short duration training.

- FCI Go Down, Sikkim
- Yuksom Breweries ltd, Sikkim
- CG Foods India Pvt. Ltd., Sikkim
- Triptiø Bakery, Sikkim
- Temi Tea Estate, Sikkim

### Study Tour

Under student ready program in VIII Semester students were deputed for Study Tour (two ó three weeks). Earlier all the students during course of their study used to undertake study tour twice (two to three weeks duration each time), one to NEH region and one to All India. The tour to NEH region was stopped after implementation of 5<sup>th</sup> Deanø committee. Now students are going only on All India Study Tour. However, due to covid-19 the tour couldnø be undertaken during 2020-21. The details of various tours undertaken by the students are given below.

**Table 10: NE Study Tour**

Year	Places visited
2016-17	<ul style="list-style-type: none"> <li>• NEHARI (Brahmputra board), Guwahati</li> <li>• IIT, Guwahati</li> <li>• IICPT, Guwahati</li> <li>• CPGS-CAU, Barapani</li> <li>• ICAR Research Complex for NE Region, Umiam, Barapani</li> <li>• NEHU, Shillong</li> <li>• Don Bosco Centre for Indigenous cultures (Agricultural gallery)</li> <li>• CPRI, Shillong</li> <li>• Tezpur University, Tezpur</li> <li>• NERIWALM, Tezpur</li> <li>• FMTTI, Biswanath Chariali</li> </ul>
2017-18	<ul style="list-style-type: none"> <li>• CPGS-CAU, Barapani</li> <li>• ICAR Research Complex for NE Region, Umiam, Barapani</li> <li>• Meterological station, Sohra, Meghalaya</li> <li>• NEHU, Shillong</li> <li>• CPRI, Shillong</li> <li>• Don Bosco Centre for Indigenous cultures (Agricultural gallery)</li> <li>• CAU, Imphal</li> <li>• Krishi Vigyan Kendra, Research farm, Andro, Imphal</li> <li>• Thangjam Agro Industry Pvt. Ltd.(Food processing unit), Imphal</li> <li>• Nilkuthi Fod Park .(Food processing unit), Imphal</li> <li>• Multi crop cold storage, Ukhrul, Manipur</li> </ul>

	<ul style="list-style-type: none"> <li>• Loktak Downstream Hydroelectric corporation ltd, Manipur</li> <li>• NEHARI (Brahmputra board), Guwahati</li> <li>• IIFPT, Guwahati</li> <li>• Annapurna group industry (Food processing unit), Guwahati</li> </ul>
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**Table 11: All India Study Tour**

Year	Places visited
2016-17	<ul style="list-style-type: none"> <li>• NIRJAFT (National Institute of Research on Jute and Fibre Technology, Kolkata)</li> <li>• CIFE (Central Institute for Fisheries Education), Versova, Mumbai</li> <li>• M/s Jain Irrigation Systems Ltd. Jalgaon, Maharashtra</li> <li>• CIRCOT (Central Institute for Research on Cotton Technology), Mumbai</li> <li>• Tractor Division Mahindra &amp; Mahindra Ltd., Worli, Mumbai</li> <li>• ICAR- Central Coastal Agricultural Research Institute, Goa</li> <li>• M/s. Sagar Feeds and food processing industry, Cuncolim, Goa</li> <li>• M/s Nestle India Ltd., Goa</li> <li>• Hindustan Foods, Usgaon, Ponda, Goa</li> </ul>
2017-18	<ul style="list-style-type: none"> <li>• PJ Telangana State Agriculture University, Hyderabad</li> <li>• Central Research Institute for dry land agriculture, Hyderabad</li> <li>• Directorate of Rice Research, Rajendra nagar, Hyderabad</li> <li>• CIFE (Central Institute for Fisheries Education), Versova, Mumbai</li> <li>• Tractor Division Mahindra &amp; Mahindra Ltd., Worli, Mumbai</li> <li>• Central Coastal Agricultural Research Institute, Goa</li> <li>• Krishi Vigyan Kendra, Panjim, Goa</li> <li>• Botanical Garden, Goa</li> </ul>
2018-19	<ul style="list-style-type: none"> <li>• NIRJAFT (National Institute of Research on Jute and Fibre Technology, Kolkata)</li> <li>• Agricultural and Food Engineering Department of IIT Kharagpur</li> <li>• M/s Jain Irrigation Systems Ltd. Jalgaon, Maharashtra</li> <li>• CIRCOT (Central Institute for Research on Cotton Technology), Mumbai</li> <li>• ICAR- Central Coastal Agricultural Research Institute, Goa</li> </ul>
2019-20	<ul style="list-style-type: none"> <li>• CIFT (Central Institute of Fisheries Technology), Andhra Pradesh</li> <li>• CMFRI ((Central Marine Fisheries Research Institute), Andhra Pradesh</li> <li>• ICAR- IIOR, Rajendranagar, Hyderabad</li> <li>• PJ Telangana State Agriculture University, Hyderabad</li> <li>• CIFE (Central Institute for Fisheries Education), Versova, Mumbai</li> <li>• CIRCOT (Central Institute for Research on Cotton Technology), Mumbai</li> <li>• Mumbai Veterinary College, Mumbai</li> <li>• CSMT, Mumbai</li> <li>• National Library, Kolkata</li> </ul>

#### **6.4.5 Conduct of the hands on training**

##### **a) Hand on training within the college**



**Under student ready program in VII semester** students of B. Tech (Food Technology) are being provided hands on training **under Skill Development Experiential Learning Programme I and II (Skill Development/In-plant training)** in the following pilot plants.

- Milk & Milk Product Processing plant
- Fruit and vegetable processing plant
- Farmers Produce Processing cum Skill Development Centre
- Rice Mill

During experiential learning/ under student ready program students also helped few NGOs for commercial preparation of **Ginger & Turmeric powder**.

**Table 12: List of Experiential Learning**

Year	Name of The Student	Title of Experiential/Detail Learning
2015	Laldanmawia N. Afzal Ali W. Thmuisang Makunga Maring Pamheiba Rajkumar Shubhankar Debnath Esther Malsawmdawngliani	Production of milk products (Ice cream & Paneer) Production of Turmeric Powder Production of Ginger flax and powder Production of Tomato Ketchup. Packaging of Orchids
2016	Vanlalhlimpuii Pachuau Lalthlamuana Ramendra Debnath Doctor Joy Tripura Sujit Das Macdonald Ropmay Antirouny K. Sangma Irengbam Barun mangan Reparani Thockchom	Production of milk products (Ice cream & Paneer) Production of Turmeric Powder Production of Ginger flax and powder Minimal processing of Fruit and Vegetables Production of Potato Chips Production of Bakery Products Production of Noodles, Pasta Production of RTS (orange & Strawberry ), Orange Juice Preparation of Pickle
2017	Laishram Susmita Devi Duffny Vanlalnghaki Vishal Kumar Yumnam Nandan Singh Andrew Hmingsangbera Minkeng Tapak Lalthanpuii Hemnam Henarita Devi Moirangthem Haribika Salam Shreekant Bishal Sinha Ramangaih Zuala	Production of Plain cake & Chocolate cake Product Development and Process Optimization of Ready - to Eat Maize Snack. Manufacturing of Guava Cheese Production of cereal based extruded product Production of milk based products (ice cream, churpi, yogurt etc.)

2018	Kumar Priyank Mwchangti debbarma Minerva Pheiroijam H. P. Lalrammawii Arpana Thapa Bijendra Prasad Mandal Aruna Chettri	Production of milk products (Ice cream, Ice candy, Mango Candy, Paneer etc.) Production of Turmeric Powder Production of RTS (orange & Strawberry ), Orange Juice
2019	Thokchom Anand Singh Philem Deepu Singh Surjit Kumar Yengkhom Ingudam Bidyasagar Prerana Preyasi Khwairakpam Bernard Singh Dhamchoe Dolma Bhutia Tenzin Chhoton Ravishankar Kumar	Production of milk products (Ice cream, Ice candy, Mango Candy, Paneer etc.) Production of Turmeric Powder Production of RTS (orange & Strawberry ), Orange Juice Production of Ginger flax and powder Minimal processing of Fruit and Vegetables Production of Potato Chips Production of Bakery Products

## b) Hands on training outside the college

### I) Research institute

Under student ready program in VIII Semester students were deputed to **CSIR-Central Food Technological Research Institute, Mysore (Internship/In-plant/Skill Development II for 13 weeks in Semester VIII)** for working in their various research projects. Few students undertook training at College of Agriculture Imphal, Manipur. The list of the report submitted by students on the basis of work undertaken at CFTRI during 2019 is given below.

**Table 13: The list of report submitted by the students deputed to Research Institute**

SI No.	Title of thesis	Name of the Student	Guide
1.	<b>Quality evaluation on physico-chemical &amp; nutritional aspects of whole dried and powdered red chillies from NEH regions of India w.r.t. FSSR (2.9.3)</b>	Thokchom Anand Singh	Dr. Mathen Mathew
2.	<b>Studies on development of low fat cookies by use of structured oil (OLEOGEL) system</b>	Philem Deepu Singh Surjit Kumar Yengkhom	Dr. P. Prabhasankar
3.	<b>Recombinant dipeptidyl peptidase-4 (DPP4) a study on its expression and purification in yeast expression system</b>	Ingudam Bidyasagar	Dr. Poornima Priyadarshini C.G
4.	<b>Development and quality evaluation of high moisture gel like ready to eat product from bael (Aegle Maarmelos L) puree</b>	Prerana Preyasi	A.S. Chauhan

5.	<b>Restructing of tender coconut water &amp; its quality characterization</b>	Khwairakpam Bernard Singh	Dr. Roopa BS
6.	<b>Preparation and characterization of corn zein nano particals / sago starch based edible packaging films</b>	Ravishankar Kumar	Dr. Keshava Murthy
7.	<b>Study on preparation and characterization of chakli (Indian Snack) form broiler chicken meat (Gallus gallus domesticus)</b>	Tenzin Chhoton	Dr. Tanaji G. Kudree
8.	<b>Preparation of enzyme modified duck egg white powder</b>	Dhamchoe Dolma Bhutia	Dr.Suresh P.V.

II) Under summer training programme students used to be deputed to Institutions of higher learning and various industries. During 2015 students were deputed to Indian Institute Technology, Kharagpur, for their training. Students took the following training at IIT, Kharagpur.

**Table 14: The list of report submitted by the students deputed to Institutions of higher learning and various industries.**

<b>Year</b>	<b>Name of The Student with Roll No.</b>	<b>Title of Experiential/Detail Learning</b>
2015.	Tolen Tombung Moirangthem, Thangsei Nengneihling Baite, Digia Lois Gangmei, Rodawngkima, Thameridus B marak,	i) Extraction of active Components from Ginger, ii) Fermentation process for alcoholic beverage iii) Extraction of active components from different varieties of Chillies. iv) Manufacturing of ice-cream

### III) Industries

Under student ready program, students were also deputed to the following industries for In-plant training in Semester VIII, related to milk processing and product development, fruits & vegetable processing and their products, spices processing and their products etc.

- Sikkim Milk Union Ltd., Sikkim
- Govt. Fruit Preservation factory (Sikkim Supreme), Sikkim
- Zydus healthcare pvt. Ltd., Sikkim
- Mehsana Dairy & Food Products ltd, Mehsana, Gujrat

Considering the input/work of the students two industries namely Govt. Fruit Preservation factory (Sikkim Supreme), Sikkim & Zydus healthcare pvt. Ltd., Sikkim has paid students a handsome amount.

#### IV) Outside the Country

During 20-21, it was planned to train final year students by well outstanding Universities and other organization of the World. However, due to the problem faced by the Country from Corona virus it could not be implemented.

### 6.4.6 Supervision of Students in UG Programme

There is no PG or Ph. D. programme in Food Technology. All the students of B.Tech (Food Technology) are given project work for one semester. During this project work they are allotted a guide/supervisor and a topic for research work. After completion of the research work they analyze the data and submit the report. They make a presentation also on the work carried out by them. The titles of the thesis/report submitted by student are given below.

**Table 15: The titles of the thesis/report submitted by student under supervision in UG Programme**

Sl No.	Year	Title of thesis/report	Name of The Student
1.	2015	<b>Standardization of traditional rice beer production method of Manipur</b>	1)Ms.Esther malsawmdawngliani 2)Mr.Shubhankar Debnath
2.	2015	<b>Study on osmo-dehydration characteristics of ginger</b>	1)Ms.Vanlalramehhani change 2)Mr. Pamheiba rajkumar
3.	2015	<b>Quality analysis of plantain fortified noodles</b>	1)Ms.Wairok Tomuishang Makunga 2)Mr.nongjaimayum Afzal ali
4.	2015	<b>Effect of drying temperature on essential oil yield of ginger</b>	Mr. Laldanmawia
5.	2016	<b>Study of functional properties of pumpkin flour fortified pasta.</b>	Mr. Sujit Das
6.	2016	<b>Study of effect of flour mixing and conditioning time on quality of extruded snacks.</b>	1)Macdonald Ropmay 2)Irengbam Barun Mangang
7.	2016	<b>Development of cold extruded pasta blended with tapioca flour</b>	Antirouny K sangma

8.	2016	<b>Study of vacuum drying characteristic of ginger</b>	1) Vanlalhlimpuii Pachua 2) Reparani Thockchom
9.	2017	<b>Textural study of selected traditional food of Sikkim</b>	1) L. Susmita Devi 2) Duffny Vanlalnghaki
10.	2017	<b>Quality evaluation of fish paneer</b>	1) Bishal Sinha 2) Ramngalhzuala
11.	2017	<b>Evaluation of physical and textural properties of indigenous varieties of chayote (<i>Sechium edule</i>) fruits</b>	1) Vishal Kumar 2) Yumnam Nandan Singh
12.	2017	<b>Quality evaluation of fish paneer</b>	1) Bishal Sinha 2) Ramngalhzuala
13.	2018	<b>Development of Pine apple- Ginger blended RTS beverages</b>	1) Damchoe dolma Bhutia 2) Khwairakpam Bernard Singh
14.	2018	<b>Quality evaluation of RTS beverages developed from Beetroot and Musleri</b>	1) Prerana preyasi 2) Thockchom Anand Singh
15.	2018	<b>Effects of selected packaging methods on shelf life of fresh ginger</b>	1) Ravishankar kumar 2) Tenzinchhoton
16.	2018	<b>Standardization and optimization of process parameters for manufacturing of yak milk paneer</b>	1) Ingudam Bidyasagar 2) Shilpa Wangkheimayum
17.	2018	<b>Assessment of functional properties of different flour</b>	1) Philem Deepu Singh 2) Surjit Kumar Yengkhom
18.	2019	<b>Study on effect of blanching methods on textural characteristic of red cherry pepper</b>	Chingakhan Ngotonmba Singh
19.	2019	<b>Development of micronutrient fortified energy bar for malnutrition children and adolescent girls</b>	Androny K. Lyngkhoi
20.	2019	<b>Performance evaluation of different peeling method of chayote</b>	Shyamkumar Yumnam
21.	2019	<b>Quality assessment of pickle prepared from the meat of leghorn breed</b>	Bodhisattwa Pal
22.	2019	<b>Preparation of ginger (<i>Zingiber officinale</i>) candy</b>	Singamayum Firdosh Nesha
23.	2020	<b>Development of Micronutrient fortified energy bar for malnutrition children and adolescent girls</b>	Androny K Lyngkhoi

**Table 16: The following students have received fellowship/scholarship for higher education (M.Tech)**

Name of Degree programme	B. Tech. (Food Tech.)					
	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Actual student admitted	9	09	09	09	10	09
No. of Passed out student	5	7	9	6	5	10
Student received fellowship for M.Tech	2	-	5	1	2	3

#### 6.4.7 Feedback of Stake Holders

In our University most of the faculty members are made Advisor of about 10 students. There has to be at least one meeting (mostly on Saturday) of the students with their Advisors. Students raised their various problems (academic, personal etc.) with the Advisor. The Advisors helped the students to solve their problem. In case, help of some particular faculty member/ staff/ Dean were needed, Advisors took their help and solved the problem.

There was / is a register with the Student Welfare Officer of the College, in which any student can raise their problems (related to academic, hostels etc.). The Student Welfare Officer brought the problem to the notice of the Dean of the College. Dean discussed the issue with the Student/ Group of Students/faculties/officials and took remedial measures.

For example fourteen complaints were received on 10/08/16. Most of the complaints were regarding repair of electrical items and civil work in Hostels which was promptly attended by AE (Civil) and JE (Electrical). Few problems were related to Wi-fi lan etc. which was tackled by computer operator. There was a suggestion regarding digitalization of library which was already in progress. On 22/0/16 a complaint was received regarding issue of identity card which was immediately attended. On 21/10/16 complaints were received regarding practical of two courses. Chemicals etc were purchased and practical were completed within a week. On 08/12/16 a complaint was received regarding water purifier in Girls Hostel which was attended and rectified in due course of time. On 24/03/18 a complaint was received regarding non- working of lan in New Girls Hostel which was immediately attended by computer operator.

During Farewell of the final year students they sometimes raised the problem faced by them during their stay of four years in the college. After knowing their problems Dean and Faculty tried to implement their suggestions.

In every Semester there was a meeting of Dean with representative of Students to discuss their problems related to teaching, hostels, etc. Generally Students raised their issue which used to be discussed in the meeting. The issues which can be solved at the College level were settled in the College itself. The issues which needed the attention of the Vice-Chancellor were sent to him for satisfactory solution.

CAU organized Agricultural Fair every year in various states of NEH. During these fair many parents visited these fairs. Many times parents also visited the college or talked to various officials over phone. During these visits and discussions they appreciate the facilities and academic atmosphere of the college. Sometimes they also made various suggestions. Many times college implemented these suggestions. Every Year College also organized Technology Demonstration Mela / Farmers Agriculture Fair. Many farmers of NEH region visited these Mela /Fair. During their visit interaction between various faculties and farmers were held and we got their opinion regarding various academic works, hostels and other facilities of the college.

Extension council meeting of the college and University were regularly held every year. During these meeting, progressive farmers, members of FPO, members of SHG, state government officials, entrepreneurs etc. participated and gave their feedbacks and suggestions.

During hands on training students interacted with various industries. During discussion of owners/ officials of these industries with various faculty members they appreciated the theoretical, practical knowledge and hard work of the students. **Govt. Fruit Preservation Factory (Sikkim Supreme) and Zydus Healthcare Pvt. Ltd., Sikkim have paid students a handsome amount during their hands on training.**

During their hands on training students interacted/ worked with entrepreneurs, farmers, FPO, SHG etc. During discussion with the faculty members these people appreciated the help, knowledge and hard work of the students.

A brain storming session was held in Dec 2020 at CAEPHT, Sikkim to discuss and finalize the researchable issues related to Post Harvest Technology for Central Agricultural University. All the faculty member of various colleges and KVK related to Post Harvest Technology participated in this session. **Two experts namely Dr. Suvendu Bhattacharya, Professor, ACSIR & Chief Scientist (Retd.), Central Food Technological Research Institute, Mysore, and Dr. Abhijit Kar, Principal Scientist, Division of Food Science & Post Harvest Technology, Indian Agricultural Research Institute, New Delhi,** also participated in this session. Their suggestions have been incorporated.

We have trained (through demonstration, short duration training, vocational training, training in the field etc.) many entrepreneurs & farmers (around 1000 numbers) during last five years in preparation of various food products such as paneer, ice-cream, cream, ice-candy, jam, jelly, sauces, RTS, squash, candy, osmo-dehydrated pineapple rings, pasta, pickle, turmeric powder, ginger flex & powder, potato chips, noodles, yacon syrup (prepared from ground apple) minimal

processing of fruits & vegetables, cookies, cake etc. At the initial stage some of the entrepreneurs used our facilities for commercial manufacturing of these items. After few years they have established their own production units. Few of the entrepreneurs/farmers have received awards also. Forexample Shri. Shisir Khadka (established Sundar Sikkim) and Shri Kailash Rana used the facilities available at Farmers Produce Processing cum Skill Development Centre, CAEPHT, Ranipool for few years (2015-2018) under the guidance of faculty and technical staff. Shri. Shisir Khadka was bestowed with **AIIFA Progressive Farmers Award** during 2017. He was also issued an appreciation letter and appointed as **State Coordinator of SEED Cell** (Sikkim Entrepreneurship and Economic Development Cell) by the Sikkim Government during 2020-21. **He was also made member of extension council of CAU.**



Fig 8: Awards received by Shri. Shisir Khadka, owner of Sundar Sikkim



Fig 9: Visit of Agriculture Minister, Govt. of Sikkim in the stall of PFE, Agri Fair at CAEPHT



Furthermore, considering the facilities, faculty, other resources, ability and interest of the college in training the farmers, entrepreneurs, and subject matter specialist, Government of Sikkim requested for conducting six training in various areas. **The Government had sanctioned Rs. 7.5 lakhs for these six trainings.** It was also requested to establish a Farmers produce processing-cum-skill development center at CAEPHT, Ranipool. **The Sikkim Government handed over machines (11 units, costing approximately 100 lakhs)** for processing of ginger, turmeric, vegetables, potato, bakery and noodles to the center for imparting training to farmers, entrepreneurs, students and scientists. **Government of Sikkim also sectioned Rs. 9.90 lakhs for conducting 20 rounds of trainings/demonstrations in this center.** The college has provided trainings to about 1000 beneficiaries. **Sashastra Seema Bal had also deputed, youths from border region of the Sikkim for attending the training on processing of horticulture crops.** The SSB also had sectioned fund for the training programme. Women self help group from SSB were also provided training at the FPPSDC.

Considering the facilities, faculty, other resources, ability and interest of the college in training the **Government of Orissa deputed five batches of state government officials for model development programme and provided necessary fund for the cause.**

**In addition to this, Power Finance Corporation Ltd. sponsored three 90 days vocational training programme for Youth of North-Eastern states of India. The National Skill Development Council, New Delhi, has sponsored two one month duration vocational trainings.**

#### 6.4.8 Student Intake and Attrition in the Programme for Last Five Years

In our university admission is given to the students of NEH region. The Quota for various states of NEH and ICAR are fixed. Various State Governments and ICAR take competitive examination and nominate selected candidate for admission in CAU. We have to admit these students if they are fulfilling the eligibility requirements.

**Table 17: State Wise Quota for B.Tech (Food Technology)**

State	Arunachal Pradesh	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura	ICAR	Total
No. of students	02	04	02	02	02	03	04	03	22

**Table 18: Actual student admitted in last five years**

Name of Degree programme	Actual student admitted in last five years						Attrition (%)					
	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
B. Tech. (Food Tech.)	11	09	09	9	10	09	15	22.2	11.11	18.18	10	0

#### 6.4.9 ICT Application in Curricula Delivery

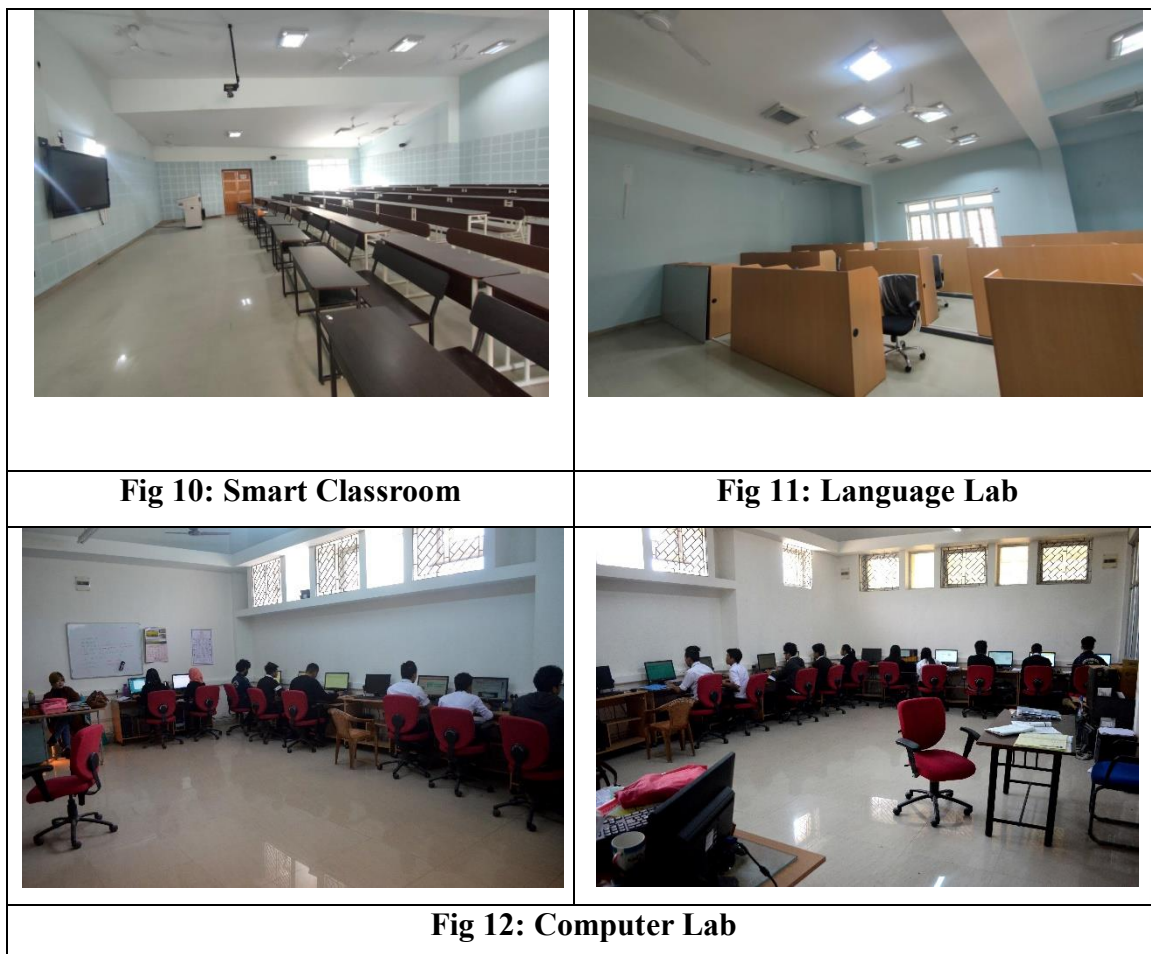
- **Interactive whiteboards and touch based computer system:**

The College of Agricultural Engineering and Post-Harvest Technology (CAEPHT) Computer Laboratory, under Central Agricultural University (CAU), Imphal, is well-equipped with 2 smart classrooms having facilities of Interactive whiteboards for conduction of online lectures and smart board allows projection of images, manipulation of images, dragging, clicking and copying of matter. Simultaneously Teacher is availed with facility to provide handwritten notes on board and same can be saved for later use.

- **Computer facilities:**

The College of Agricultural Engineering and Post-Harvest Technology (CAEPHT) Computer Laboratory, under Central Agricultural University (CAU), Imphal, is well-equipped with 20 computers for computing facilities to all the students of the college, teaching and non-teaching staff members along with Internet connectivity. It also provides Internet facilities to all teaching staff, administrative staff and all students of the college. There are approximately more than 300 users who are availing the Internet and computing facilities. The Computer Centre supports a wide 1000 Mbps fiber optic network (OFN) that connects all the academic units, hostels, library, dispensary, residence and other central facilities to the Computer Centre. Users can use the computing resources of Computer Center from their offices, academics unit, hostels and residences. Login is provided to all the students, faculty and staff members for Internet browsing. Besides, Wi-Fi facility is provided to boys' hostel, girls' hostel, ATIC Building, guest house, dispensary, VC camp, and Dean's residence. LAN is provided through optical fiber connection in North Academic building, South

Academic building, new girls' hostel, auditorium, staff quarter, medical unit and Farmers Produce Processing cum Skill Development Centre. The network Security is Provided through UTM/Firewall.



**(b) Library Services:**

The Library provides circulation and reference services. All the in-house operations of the Library are fully computerized using the networked version of the Library software KOHA with Web OPAC facilities. The Library also has access to online e-journals through CeRA. Photocopying and printing facility is also available in the Library. Details of library are as given below: Area of Library: 2400 sq. ft. (223 sq. m.)

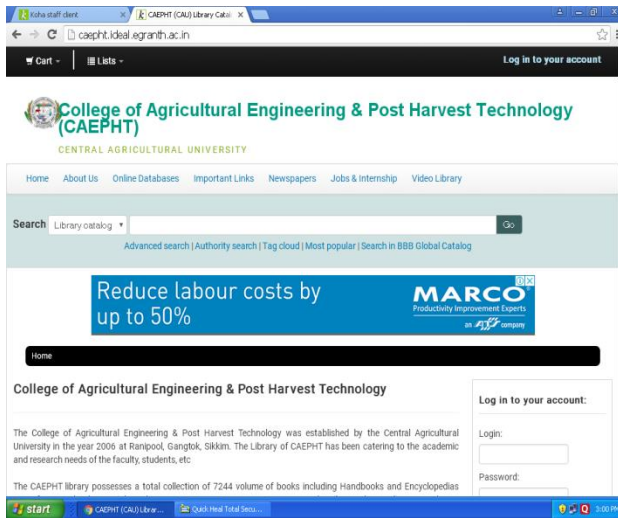
**Table 19: Details of Library**

<b>Sl No.</b>	<b>Particulars</b>	<b>Details</b>
1.	Present staff	<ul style="list-style-type: none"> <li>• 1 Senior Library Assistants</li> <li>• 1 Library Assistants</li> <li>• 3 Multi-tasking Staffs</li> </ul>
2.	Availability of Wi-fi	<ul style="list-style-type: none"> <li>• Wi-fi facilities area available in the library with a band width speed of 1GBps from NIC-NKN network.</li> </ul>
3.	Books	<ul style="list-style-type: none"> <li>• For College of Agricultural Engineering and Post-Harvest Technology: <b>7831 books</b></li> </ul>
4.	Other reading materials	<ul style="list-style-type: none"> <li>• National and local newspaper such as Dainik Jagran (Hindi), The Telegraph, The Times of India, Sikkim Express (English), Hamro Prajashakti (Nepali)etc.</li> <li>• Magazines like India Today, Down To Earth, Pratiyogita Darpan, Civil Services Chronicle, Kurukshetra, Yojana, Agriculture Today, Economics and Political weekly.</li> </ul>
5.	Research Journals	<ul style="list-style-type: none"> <li>• Students and faculty can access journals through online portal of CeRA, ICAR.</li> </ul>
6.	Internet with computers	<ul style="list-style-type: none"> <li>• Two</li> </ul>
7.	Sitting capacity	<ul style="list-style-type: none"> <li>• 28numbers</li> </ul>
8.	Latest technology in library	<ul style="list-style-type: none"> <li>• KOHA LMS is being used for Library Automation in CAEPHT Library. Necessary steps have been initiated for accessing online journals and study materials at Electronic Resource Management package for e-journals</li> </ul>

		access through CeRA (Consortia fore-Resources in Agriculture)
9.	Stocking arrangement	<p>Library adopted Open Access System for accessing library collection and classified according to Dewey Decimal Classification (DDC) scheme (22 Ed.) and arranged in APUPA pattern, stacked in different parts like,</p> <ul style="list-style-type: none"> <li>• Subject books</li> <li>• Kannada/Literature books</li> <li>• General books</li> <li>• Reference books</li> <li>• Competitive Exam books</li> <li>• Thesis</li> <li>• Back volumes</li> </ul> <p style="text-align: right;">Seminar scripts</p>
10.	Operating hours	<ul style="list-style-type: none"> <li>• 10.00 AM to 05.00PM</li> </ul>
11.	Books available in COH	<ul style="list-style-type: none"> <li>• Horticulture, Crop Physiology, Plant Biotechnology Genetics and Plant Breeding, Entomology, Microbiology, Agronomy, Plant Pathology, Crop Physiology, Soil Science &amp; Ag. Chemistry, Agro forestry, Ecology, Text book of Advanced Pomology, Plant Biotechnology, Plant Biochemistry, Ag. Economics, Ag. Extension, Statistics, Computer Application &amp; IPR, Botany, Floriculture, Pest management in vegetables,</li> </ul> <p style="text-align: right;">Handbook of Beekeeping.</p>



**Fig 13: Library at College of Agricultural Engineering & Post-Harvest Technology**



**Fig 14: Website Page of CAEPHT Library portal for quick access**



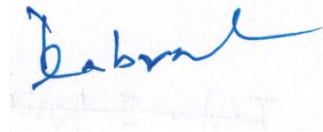
**Fig 15: Maintenance of library books, circulation, documentation, nomenclature and serials using KOHA**

6.4.10. The information pertaining to 6.4.1 to 6.4.9 has been provided for UG programme *i.e.*, B.Tech. (Food Technology) of College of Agricultural Engg & PHT, CAU, Ranipool Gangtok Sikkim, Sikkim is correctly.

6.4.11. Since the accreditation of Programmes is related to the All India Admission from ICAR and also having weightage for College accreditation, therefore the data presented in the section 6.4 is liable to the verification at any stage.

#### 6.4.12. Certificate

I, Parmendra Prasad Dabral, the **Dean, College of Agricultural Engg & PHT, CAU, Ranipool Gangtok Sikkim** hereby certify that the information contained in Sections 6.4.1 to 6.4.9 are furnished as per the record available in the college and degree awarding university.



Signature of the Dean  
of the college  
With Date & Seal

