# SELF STUDY REPORT FOR

# M.Tech. (Processing & Food Engineering)


**SUBMITTED TO**

**National Agricultural Education Accreditation Board,**
**Indian Council of Agricultural Research, Krishi Bhavan,**
**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 ógreen revolutionô in the late 60s and early 70s. As a result of ógreen revolutionô 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 accreditated 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**

# CONTENTS

# 6.4. SELF STUDY REPORT FOR POST GRADUATEDEGREE PROGRAMME

## 6.4.1 Brief History of the M.Tech (Processing and Food Engineering) Degree Programme

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 20 students were admitted in B.Tech. Agril. Engg. Programme, 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

**Brief History of the M.Tech program of Processing & Food Engineering**

After initiation of college in 2006 with B. Tech. in Agricultural Engineering degree programme and starting Food Technology from year 2010 and when three Batches of B. Tech in Agricultural Engineering were passed out a need was felt to initiate M.Tech Programme in Food Engineering. Hence, a new programme entitled M.Tech (Food Engineering) was initiated during 2013. The program was renamed as Agricultural Engineering with specialization in Processing and Food Engineering after fifth deanôs committee recommendation.

**Department of Processing & Food Engineering**

The mission of the Processing and Food Engineering Department of CAEPHT is, to be a centre of excellence in teaching, research and extension education in the discipline of post-harvest technology and Food Technology, so as to reduce losses in post-harvest management and value addition to crops produced in NEH region.

With the help of well established labs and pilot plants (including milk & milk product processing plant, fruits and vegetables processing plants etc.), mini rice mill, Farmers produce processing and skill development centre, this department is contributing for the running of **two B.Tech.** (Agricultural Engineering & Food Technology), **one M.Tech** (Processing and Food Engineering) and one **Ph.D**. (Processing and Food Engineering) Programme. The M.Tech students are getting the following scholarships & Fellowships.

**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.

## Thrust Areas

With respect to human resource development, research and extension education activities the college has setup following thrust areas;

**i) Human Resource Development**

Human resource development in the discipline of Agricultural Engineering ( including Post Harvest Technology and Food Technology).

**ii) Research**

- Mechanization of hill agriculture with conservation approach having organic base to increase production, and productivity of crops by adoption/refinement/development of gender specific equipment/machinery/technology for higher cropping intensity and to maintain timeliness of farm operations with reduced cost and drudgery
- Adoption/refinement/development of improved soil-water measures and on-farm water harvesting and recycling techniques along with micro-irrigation systems for higher water use efficiency and protected cultivation
- Adoption, promotion and development of improved techniques of post-harvest management, processing and value addition of crops produced in the region
- Adoption and promotion of use of different appropriate renewable sources of energy having enhanced energy use efficiency in production and processing agriculture and rural living

**iii) Extension Education**

Undertaking variety of extension-education activities for transfer of technology through

involvement of farmers, researchers, manufactures and extension education functionaries for promoting adoption of improved equipment/machinery/tools and gadget and technology for higher productivity and profitability with reduced losses ensuring higher net returns to the farming community of the region. To train entrepreneurs and farmers to establish industries in related areas.

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

Initially there were four departments in the college. **During 2016-17 various teaching/research departments were reorganized on the basis of 5th Dean's committee recommendations** and now there are **six departments** to cater to the need of our mandate and thrust area.

1) Department of Processing and Food Engineering (PFE)
2) Department of Farm Machinery and Power Engineering (FMPE)
3) Department of Soil and Water Conservation Engineering (SWCE)
4) Department of Irrigation and Drainage Engineering (IDE)
5) Department of Renewable Energy Engineering (REE)
6) Department of Basic Engineering and Applied Science (BEAS)

- **Statistics of Master's degree programme (2015-16 to 2019-20)**

| Year of Admission | Admitted | | | Dropped | | | Passed | | | Degree award during the year | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Boys | Girls | Total | Boys | Girls | Total | Boys | Girls | Total | | |
| 2015-16 | 01 | 01 | 02 | - | - | - | 01 | 01 | 02 | 2017-2018 | |
| 2016-17 | 02 | - | 02 | - | - | - | 02 | - | 02 | 2018-2019 | |
| 2017-18 | 02 | - | 02 | 01 | - | 01 | 01 | - | 01 | 2019-2020 | |
| 2018-19 | 02 | 02 | 04* | - | - | - | | | | 2020-2021 | Yet to complete |
| 2019-2020 | 02 | - | 02 | - | - | - | | | | 2021-2022 | Yet to complete |
| 2020-2021 | 05 | 02 | 05 | 01 | - | 01 | | | | 2022-2023 | Yet to complete |
| Total | 14 | 05 | 17 | 02 | - | 02 | 05 | 01 | 05 | | |

***One has partial-withdrawn and joined State Government job**

**Award of CAU, GOI & ICAR authorities' Scholarships**

| M.Tech.(PFE) | Scholarship Type | | | |
|---|---|---|---|---|
| | University Scholarship (CAU) | ICAR scholarship(NTS) | SC/ST Fellow Ship | GOI Scholarship (SC+ST) |
| 2015-16 | 02 | - | - | - |
| 2016-17 | 03 | 01 | - | - |
| 2017-18 | 01 | 03 | - | - |
| 2018-19 | 02 | 04 | - | - |

| | | | | |
|---|---|---|---|---|
| 2019-20 | 03 | 01 | - | - |
| 2020-21 | 04 | 02 | - | - |
| TOTAL | 9 | 8 | - | - |

## 6.4.2 FACULTY STRENGTH

As per the Fifth Dean Committee report by ICAR, **Forty Four faculty members** (Seven Professors, Thirteen Associate Professors and Twenty Four Assistant Professors) are needed to teach and guide the students of B.Tech, M.Tech and Ph.D. courses related to Agricultural Engineering. The sanctioned strength of various faculties at this college is **Forty Six**. At this College the following Faculty members were involved in teaching and guiding the students of Two B.Tech, Five M.Tech and Three Ph.D. level courses during 2015-2020.

| Faculty | Number | Permanent | On contract/from other sister organizations/guest | Faculty recommended by the ICAR/5th Dean's Committee | Faculty involved in teaching of M.Tech (PFE) |
|---|---|---|---|---|---|
| Professor | 7 including Dean | 5 including Dean | 1 (On Contract)<br>1(as guest) | 7 including Dean | 4 |
| Associate Professor | 4 | 3 | 1(as guest) | 13 | 1 |
| Assistant Professor | 34 | 26 | 2(as guest)<br>3 (sister organization-COH)<br>3 (on Contract) | 24 | 11 |

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

However, fifteen faculties (Four professors, One Associate Professor and Ten Assistant Professor) were involved in teaching and guiding the student in M.Tech (Processing & Food Engineering). Information regarding the designation and qualification of various faculty members are given below.

**Faculty involved in teaching and guiding the student in M.Tech (Processing & Food Engineering).**

| Faculty | Number |
|---|---|
| Professor | 04 |
| Associate Professor | 01 |
| Assistant Professor | 10 |
| Total | 15 |

## Information regarding faculties teaching and guiding M.Tech (Processing and Food Engineering) programme

| Area | Course Title &No. of Credits | Faculty | Qualification |
|---|---|---|---|
| **Major Courses (Core)** | Engineering Properties of Food Materials&3 (2+1) | Dr. R.P. Misra, (Prof.)<br>Dr. S. Jena (Associate. Prof.)<br>(Late) Dr. A.I. Singh (Asst. Prof.) | Ph.D<br>Ph.D<br>Ph.D |
| | Unit Operations in Food Process Engineering | Dr. Sujata Jena (Associate Prof.) | Ph.D |
| | Advanced Food Process Engineering3 (2+1) | Dr. Sujata Jena (Associate Prof.) | Ph.D |
| | Transport Phenomena in Food Processing &3 (2+1) | Dr Rakesh Kumar Raigar (Asst. Prof.) | Ph.D |
| | Agro energy audit and management & 2 ( 2+0) | Prof. M. S. Seveda (Professor) | Ph.D |
| | Applied Instrumentation&3 (2+1) | Er Rajiv Pradhan (Asst. Prof.) | M.Tech |
| **Major Courses (Optional)** | Food Packaging&3 (2+1) | Dr Rakesh Kumar Raigar (Asst. Prof.) | Ph.D |
| | Food Quality and Safety Engineering | Dr. Said Prashant P (Asst. Prof.) | Ph.D |
| | Processing of Cereals, Pulses and Oil Seeds&3 (2+1) | Dr. R.P. Misra (Professor)<br>Dr R.K. Raigar (Asst. Prof.) | Ph.D<br>Ph.D |
| **Minor Courses** | Water Quality and Pollution Control | Dr. G.S. Yurembam (Asst. Prof.) | Ph.D |
| | Agro-energy audit and management | Dr. N.P. Digambar (Asst. Prof.) | Ph.D |
| | Design and analysis of renewable energy conversion systems&3 (3+0) | Dr. M. S. Seveda (Professor) | Ph.D |
| **Compulsory Courses (Non Credit)** | Library and Information Services1(0+1) | Mr. Pawan Kumar (Library Incharge) | M.Sc |
| | Agricultural Research, Research Ethics and Rural Development Programmes1(1+0) | Dr. M. S. Seveda (Professor) | Ph.D |
| | Computer Applications in Agriculture1 (0+1) | Er. Rajiv Pradhan (Asst. Prof.),<br>Dr S R Yadav (Asst. Prof.)<br>Mrs. T . Loidang Chanu (Asst. Prof.) | M.Tech<br>Ph.D<br>M.Sc |
| | Technical Writing and Communications Skills& 1(0+1) | Dr. D. Roy (Asst. Prof.) | Ph.D |
| | Basic Concepts in Laboratory Techniques & 1(0+1) | Dr. Said P.P. (Asst. Prof.) | Ph.D |

| | | | |
|---|---|---|---|
| | Disaster Management&1(1+0) | Dr. B.C Kusre (Professor) | Ph.D |
| | Intellectual Property and its Management in Agriculture&1(1+0) | Dr. S. N Yadav (Professor) | Ph.D |
| **Seminar** | Masterôs Seminar1 (1+0) | Dr. R. P. Misra (Professor)<br>Dr. S. Jena (Associate. Prof.)<br>Dr. B. K. Singh (Asst. Prof.) | Ph.D<br>Ph.D<br>Ph.D |
| **Supporting Courses** | Data Analysis using Statistical Packages & 3 (2+1) | Mrs. T. Loidang Chanu (Asst. Prof.)<br>Dr. S. K. Meher (Asst. Prof.) | M.Sc<br>Ph.D |

## 6.4.3 TECHNICAL AND SUPPORTING STAFF

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

| Sl. No. | Name of the Post | No. of Post | Actual Filled | Vacancy |
|---|---|---|---|---|
| 1 | Field Cum Lab Assistant | 04 | 04 | 00 |
| 2 | MTS **(Multi-tasking staff)** | 03 | 03 | 00 |

## 6.4.4 CLASSROOMS & LABORATORY

There are two classrooms, which are exclusively being used by the students of M.Tech (Processing & Food Engineering). The smart class room facility is being also utilized by the students of M.Tech (Processing & Food Engineering). There are various labs which are being utilized by various UG, PG & Ph.D. Programs. These labs are well equipped as per the recommendations of various Deanôs Committee.

| Sl. No. | Name of the Laboratory |
|---|---|
| 1. | **Food Engineering laboratory** (consisting of Food Process Technology unit and Food Product Development unit) (Area- 228.28$m^2$ ) |
| 2. | **Process Engineering laboratory** (consisting of unit operation lab, packaging unit etc.) (Area- 92.77$m^2$) |
| 3. | **Food Analysis laboratory** (consisting of Food Rheology and sensory unit, Food Bio-Technology unit and Food Analytics unit etc.) (Area-93.24 $m^2$) |
| 4. | **Agricultural Structures & Environmental Control Laboratory Engineering laboratory** (consisting of Heat, Mass & Refrigeration ï Air Conditioning Unit)(Area- 80.71 $m^2$) |
| 5. | **Pilot Plant for Milk Processing** including Dairy Technology Lab, chiller unit, spray dryer unit& milk reception unit etc.(Area-201.51 $m^2$) |
| 6. | **Pilot Plant for Fruits and Vegetable** including Cottage scale soya paneer plant (Area-124.03 $m^2$) |

| | |
|---|---|
| 7. | **Multi stage evaporator with aroma recovery system**(Area-20.9$m^2$) |
| 8. | **Shed for Feed and Fodder crusher and seed processing unit** etc.( 119.66 $m^2$) |
| 9. | **Mini Rice Mill** (Area 148.65$m^2$) |
| 10. | **Farmer's Produce Processing cum Skill Development Centre** (Area 265.26 $m^2$ )<br>(consisting of Ginger & Turmeric Processing Plant ï Area 72 $m^2$, Unit of Minimal Processing of Fruits and Vegetableï Area 17.84$m^2$, Bakery unitï Area 23.78$m^2$, Noodles unitï Area17.84 $m^2$, Potato Chips unit ï Area 17.84 $m^2$, storeï Area 25.65 $m^2$, kitchen ï Area 17.84 $m^2$, class roomï Area 27.87 $m^2$, training hall ï Area 44.6 $m^2$ ) |
| 11. | **Biochemistry Lab** |
| 12. | **Microbiology Lab** |
| 13. | **Workshop** |
| 14. | **Computer Lab** |

**M.Tech students working on their research work**

**Sensory evaluation of the product developed by M.Tech Student**

**Major equipment of Processing & Food Engineering Department**

| | |
|---|---|
| Steam Distillation set up<br>Fruit pulper<br>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)<br>Coconut tree climber<br>Coconut dehusker<br>Pasta Extruder<br>Essential Oil distillation Unit<br>Solid Liquid Extraction unit<br>Steam Distillation Set up<br>Simple batch distillation unit<br>Refrigerated centrifuge with Micro processor<br>Rotary vacuum filter & Leaf Filter<br>Refrigerated centrifuge CPR 24<br>Plate heat exchanger<br>Usha make Gerber Centrifuge<br>Usha make centrifuge separator<br>Vegetable Blancher<br>Vacuum Tray Dryer<br>General cycle refrigeration trainer<br>Heat transfer through lagged pipe apparatus<br>Heat transfer through composite walls apparatus<br>Mechanical heat pump trainer<br>Plate type heat exchanger<br>Recirculation type air conditioning trainer<br>Stefan Boltzmann apparatus<br>Thermal conductivity of insulating slabs by guarded hot plate method<br>Thermal conductivity of insulating powder<br>Micrometer Precise Thickness<br>Shrink Wrapping Machine<br>Aspirator/ Cyclone Separator<br>Automatic Foam Fill Seal packaging Machine<br>Rubber Roll Sheller<br>Rice Whitener/Polisher<br>Indented Cylinder Grader/ Separator<br>Vibratory Screen Grader<br>Freeze Dryer<br>Food texture analyzer<br>Rapid visco analyzer<br>BOD Incubator with shaker<br>Automatic Fibre Extraction system | Vacuum Packaging Machine<br>Steam Jacketed cooking kettle<br>Butter churn<br>Vacuum oven<br>Vacuum Tray Dryer<br>Laboratory Pasteurizer<br>Shrink Packaging Machine Model-CP-2030<br>Laboratory homogenizer<br>Micro Pulverizer (hammer mill)<br>Feed and Fodder crusher<br>Feed Block Formation Machine<br>Food Extruder<br>Fruit and Vegetable Juice and paste Processing Plant<br>Boerner conical divider<br>Bucket elevator<br>Multipurpose grain mill<br>Super critical fluid extraction unit<br>Foot Sealer<br>Fermenter<br>Hand sealer<br>Electronics Grain Moisture Meter<br>Angle of Repose apparatus<br>Digital Humidity Sensor and Indicator<br>Hot Air Oven<br>Electronic weighing balance (2.2kg)<br>Electronic weighing balance ZSP-350 (300g)<br>Digital balance model ï (A-224) make Contech Capacity-220gm<br>Digital Precision Electronic Balance<br>Apparatus for thermal conductivity of insulating powder<br>Convection apparatus (natural)<br>Convection apparatus (forced)<br>Concentric tube heat exchanger (finned tube type)<br>Concentric tube heat exchanger (plain tube type)<br>Emissivity measurement apparatus<br>Digital temperature meter<br>Electronics Socs Plus Automatic Three Place<br>Solvent Extraction Apparatus (Soxlet)<br>Microscope-Ex-21 set Binocular Brand-OLYMPUS<br>Viscometer<br>Usha Make Centrifuge Separator<br>Usha Make Gerber Centrifuge (2nos)<br>Water Activity Meter<br>Samsung Freeze with stand<br>Water Purification System<br>Ginger Washing Machine |

| | |
|---|---|
| Digital Refractrometer PAL<br>Laminar Flow<br>Fruit and Vegetable Plant<br>Milk Processing Plant<br>Multi stage evaporator with aroma recovery system<br>Cottage scale soya paneer plant<br>Seed processing plant<br>Modern rice mill (0.5 t/h capacity)<br>Mini Dal Mill<br>Milk analyzer Master Clasic<br>Oxygen and $CO_2$ Headspace Gas analyzer plus Flexible packaging kit<br>Microwave oven<br>Water Bath<br>Laboratory Spray Dryer<br>Cream Separator<br>Freeze Drier<br>Digital Satorious Infra-red Moisture Meter<br>pH meter<br>Chromameter<br>Autoclave | Vegetable Cutting Machine<br>Spice processing plant<br>Ginger /Turmeric peeler cum polisher<br>Garlic Bulb Breaking Machine<br>Garlic Clove Flaking Machine<br>Ginger Processing Machine (Complete Unit)<br>Turmeric Grinder<br>Potato Slicer<br>Vegetable Washing Machine<br>Complete unit of Potato Chips Machine<br>Complete Unit of Biscuits Making Machine<br>Complete Unit of Noodle Making Machine<br>Ginger Paste and Powder Making Machine<br>OTG Oven |

## 6.4.5 CONDUCT OF PRACTICAL AND HANDS-ON-TRAINING

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

There are manageable number of students who are kept in one batch during Theory & Practical classes to ensure better delivery of information, encourage studentsô participation and active monitoring. Students conducted their practical training in various Laboratory, Pilot plants and Farmers Produce Processing Cum Skill Development Centre of the college. 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.

**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. | **M.Tech. ( Processing and Food Engineering)** | Full strength | Full strength |

**Conduct of the hands on training**

**A. Hands on training outside the college**

(a) In research institute

Students were deputed to the following research institute for undertaking advance training in latest instruments related to their project work.

- ICAR-Central Institute of Post Harvest Engineering & Technology (CIPHET) Ludhiana, Punjab
- Indian Institute of Food Processing Technology Thanjavur, Tamil Nadu
- ICAR-The National Dairy Research Institute, Karnal, Haryana
- ICAR-Central Institute of Fisheries Technology, Visakhapatnam
- College of Agriculture, Central Agricultural University, Imphal.

(b) Industries

Students were also deputed to the Thangjam Agro Industries Pvt.Ltd. (Likla) Chingmeirong, Imphal East, Manipur, a reputed industry for hands on training related to their project work

## 6.4.6 SUPERVISION OF STUDENTS IN PG PROGRAMME

There are sufficient numbers of qualified and experienced faculties who are guiding M.Tech students in the area of Processing & Food Engineering. The names of the faculties who are entitled to guide M.Tech students are given below.

| Sl. No. | Name of the faculty | Designation | Qualification | Experience | No. of students guided/guiding | | |
|---|---|---|---|---|---|---|---|
| | | | | | B.Tech | M.Tech | Ph.D |
| 1. | Dr. R. P. Misra | Professor | Ph.D. | 44 years | 5 | - | - |
| 2. | Dr.(Mrs.)Sujata Jena | Associate Professor | Ph.D. | 15 years | 32 | 5 | 1 |
| 3. | Dr. B. K. Singh | Assistant Professor | Ph.D. | 25 years | 33 | 3 | 2 |
| 4. | Late Dr. A. I. Singh | Assistant Professor | Ph.D. | 15 years | 25 | - | - |
| 5. | Dr. Said P. P. | Assistant Professor | Ph.D. | 6 years | 11 | 2 | - |
| 6. | Dr. Rakesh Kr. Raigar | Assistant Professor | Ph.D. | 6 years | 7 | 2 | - |

### Title of the Thesis by M.Tech student

| S. No. | Title | Student Name |
|---|---|---|
| 1 | Standerdization of Vacuum Drying Parameters for Drying Green and Red cherry Paper (Dalley) | Er. Sajesh Chhetri |
| 2 | Optimization of vacuum drying paramters for production of ginger powder from Gorubathane | **Er. Thameridus Marak** |

| | | |
|---|---|---|
| | varietry of Sikkim | |
| 3 | Standardization of Process Technology for the Manufacture of Intermediate Moisture Foods from Chayote (Sechium edule) | **Er. Taynath Santosh Jagannath** |
| 4 | Functional Design and Development of a Simple Batch Type Osmotic Dehydrator for Horticultural Crops | **Er. Jitson Achom** |
| 5 | Standardization of Process for Development of Composite Flour Based Multi-Grain Pasta | **Er. Vijay Shankar Kushwaha** |
| 6 | Development of foam mat vacuum dried pomelo juice powder | **Er. Sophia Chanu Warepam** |
| 7 | Optimization of peeling method and process parameters for chayote peeling | **Er.Chukkaluru Hima Bindu** |
| 8 | Development of Commercial Fish Feed for Grass Carp utilizing Local Materials. | **Er. Devarakonda Rajesh** |
| 9 | Process Standardization for Extraction of Oligosaccharides from Rice bean | **Er. Bharat Bhushan** |

## 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 22/0/16b a complaint was received regarding issue of identity card which was immediately attended. On 21/10/16 complaints were received regarding practicals of two courses. Chemicals etc were purchased and practicals

were completed within a week. On 08/12/16 a complaint was received regarding water purifier in Girlôs 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 Girlôs 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 / Farmersô 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 namelyDr. Suvendu Bhattacharya, Professor, ACSIR & Chief Scoientist (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. For example 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 bestowned with ñAIFA Progressive Farmers Awardò 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.


**Awards received by Shri. Shisir Khadka, owner of Sundar Sikkim**


**Visit of Agriculture Minister, Govt. of Sikkim in the stall of PFE Dept, 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 Farmersô 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 FIVEYEARS

| Name of the Degree Programme | Actual students admitted in last five years | | | | | | Attrition (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 |
| M. Tech (PFE) | 02 | 02 | 02 | 04 | 2 | 05 | 00 | 00 | 50 | 00 | 00 | 20 |

## 6.4.9 ICT APPLICATION IN CURRICULA DELIVERY

College is having a well equipped Computer Lab with Internet Lan Connection, 10 KVA UPS, 20 Computers. All the six departments and various externally funded Projects are having Computer facilities which were used for teaching, practical, project work analysis etc of students. The college is having a system (e- collection) through which students deposited their fees etc. online itself. All the funds either from the University or from various funding agencies for various outside funded projects were/are deposited in the college account through Public Finance Management System. Wi-Fi availability and internet services are available in the whole campus (Academic buildings including class rooms, hostels, residential colony).

Our Library is having more than 7832 Books for use by the Students. It is also having various facilities where student can go through various Journals, Books etc. online either in the Library or Class Rooms or Departments or in their Hostel rooms etc.. The Library provides Circulation and reference services. All the in-house operations of the Library are fully computerized using the network version of the library software KOHA with web OPAC (Online Public Access Catalogue) facilities. The library has also access to online e-journals through CERA (Consortium for e-Resources in Agriculture) and IP address has been activated to access the online journals through CERA in entire CAEPHT Campus. Plagiarism check for M.Tech & Ph.D. thesis was/is done through Ant plagiarism software URKUND in library. Photocopying & Printing facilities are also available in the library. Students used all these facilities during the period under report..

Furthermore, occasionally college organized various courses on Computer programming and on their use. During 2015-16 a course on Computer Aided Design was organized for the students. Er. B. K. Garg, Retired Principal Scientist, Central Institute of Agricultural Engineering, Bhopal coordinated this training.

For data analysis students used software viz., Design Expert, Origin etc. related to statistical analysis. Use of CATIA software by students for 3D modeling and design of processing equipment was very useful for them.

Workshop on óOnline Safety: social surfing 30ô was organized on 18.11.17. There were/are many videos on various topics related to various subjects and machines. These videos are prepared by faculties of renowned organization such as Indian Institute of Technology. Our faculties have also prepared many videos, presentations (slide with audio). These videos (mostly available in YouTube) are being used by various faculty members for teaching various courses.

**6.4.10.** The information pertaining to 6.4.1 to 6.4.9 has been provided for PG programme *i.e.,* M.Tech. (Agricultural Engineering) in Processing and Food Engineering of College of Agricultural Engg & PHT, CAU, Ranipool Gangtok Sikkim, Sikkim is correctly.

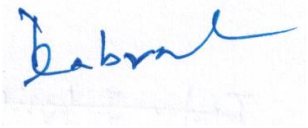
**6.4.11.** Since the accreditation of Programmes is related to the All India Admission from ICAR and also having weightage for College accreditation, therefore the data presented in the section 6.4 is liable to the verification at any stage.

**6.4.12**

## CERTIFICATE

I the Dean, P. P. Dabral, College of Agricultural Engineering & Post Harvest Technology, Ranipool, Sikkim, hereby certify that the information contained is furnished as per the records available in the college and degree awarding university.

Date:



(P. P. Dabral)

Dean