

## **B. Name of the Programme: M. Tech Processing and Food Engineering**

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

The degree programmes such as M. Tech. (Post Harvest Engineering) and M.Tech. (Food Engineering) have been running since the year 2011 under the Faculty of Agricultural Engineering, BCKV, Mohanpur, West Bengal. As per the recommendation of Broad Subject matter Area (BSMA) committee of ICAR, a new programme of M.Tech (Processing and Food Engineering) has been created by merging both the existing programmes. It covers wide range of areas like Thermodynamics, Transport Phenomena, Engineering Properties of Foods, Processing of Cereals, Pulses and Oilseeds, Processing of Horticultural Crops, Refrigeration and Cold Storage, Dairy and Food Processing, Food Plant Equipment Design, Food packaging Technology, Bio-process Engineering, Dairy and Food Product Technology etc. The faculty members are engaged in teaching, research and extension activities to create skilled human resources for rapidly growing food processing sector. The main **mission** of this discipline is

- To provide knowledge and skills for better preservation, processing and value addition to agro-products, with the aim of supporting the producers.
- To promote research and development for product and process and assurance of high level of hygiene and safety of processed food.
- To promote food safety laws and regulations for supporting a competitive, modern and safe food market for the consumers.

Since inception, the department of Post Harvest Engineering is engaged with teaching, research and extension activities on proper storage of cereal, pulses, oilseeds and other crops in order to minimize the post harvest losses. Work is also done to design and develop different grain storage structures.

The department of Food Engineering is engaged with teaching and research activities on various processing operations applied to different food items. The department has developed a solar refrigeration system for on-farm cooling of horticultural crops. A well equipped laboratory for quality analysis of various food products has also been developed under this department.



**Programme Accomplishment:**

- In last 5 years 10 (Ten) students completed M. Tech. Programme successfully.
- 5 (Five) students joined Ph.D in different SAUs after completing the M.Tech.
- 3 (Three) students joined in jobs in various Govt./ Non-Govt. organizations after completing M.Tech.

**6.4.2 Faculty Strength:**

Sl. No.	Faculty Designation	Sanctioned posts	Faculty in Place*	Vacant Position	Faculty recommended by ICAR
1	Professor	2	1	1	1
2	Associate Professor	0	0	0	2
3	Assistant Professor	6	5	1	3
<b>Total</b>		<b>8</b>	<b>6</b>	<b>2</b>	<b>6</b>

**6.4.3 Technical and Supporting staff:**

Units/ Departments	Sanctioned staff	Staff in Place	Vacant Position	Staff strength recommended by the ICAR/ other regulatory bodies
Department of Post Harvest Engineering	1	0	1	5
Department of Food Engineering	1	0	1	
Workshop	14	4	10	27
<b>Total</b>	<b>16</b>	<b>4</b>	<b>12</b>	<b>32</b>

\*Staff details of each unit are given below

**(A) Staff details of Department of Post Harvest Engineering**

Sl. No.	Name of Post	Number of Sanctioned
1.	Field Worker	1

**(B) Staff details of Department of Food Engineering**

Sl. No.	Name of Post	Number of Sanctioned
1.	Lab. Attendant	1

**(C) Staff details of Workshop unit**

Sl. No.	Name of the Post	Number of Sanctioned
1.	Workshop Supervisor	1
2.	Store Keeper	1
3.	Technical Assistant	1
4.	Turner	1
5.	Welder	1
6.	Jr. Assistant	1
7.	Jr. Electrician	1
8.	Jr. Carpenter	1



**(C) Cont..Staff details of Workshop unit**

Sl. No.	Name of the Post	Number of Sanctioned
9.	Fitter Gr. -II	1
10.	Jr. Fitter	1
11.	Jr. Blacksmith	1
12.	Lab. Attendant	1
13.	Office Attendant	1
14.	Workshop Mate	1
<b>Total</b>		<b>14</b>

At present Staff in Place are 4 compared to the requirements of 32 as per ICAR Vth Deans' Committee recommendation. Hence, the M.Tech. programme is being continued by employing some contractual staffs. The list of contractual staffs are given below:

Sl. No.	Department/ Unit	Manpower Details
1.	Workshop	Mechanic- 1 No.
2.	Dean's Unit	Technical Manpower -1 No.
3.	Processing & Food Engg.	Contractual Manpower – 2 Nos.

**\*Registrar's order vide Reference No. W & W/10/A/2009-2010/L-1502 dated 31.12.2014 (See Annexure -II)**

**6.4.4 Classrooms and Laboratories:**

**6.4.4.1 Number of Classrooms for M.Tech (Processing and Food Engineering) Programme:**

Class room for	No. of class rooms	Area (Square-metre)	Sitting capacity
1 <sup>st</sup> Year M.Tech.	1	51.48	30
2 <sup>nd</sup> Year M.Tech.	1	19.36	15

The Department has been equipped with 2 (Two) numbers of class rooms for conducting PG classes.

**6.4.4.2 Number of Functional Laboratories:**

Sl No.	Name of Laboratory/ Facility	Area (Square-metre)	No. of Supporting Staff Attached
1	Post Harvest Engineering Lab	45.9	1 (Contractual)
2	Post Harvest Analytical Lab	45.9	
3	Electrical, Electronics and Instrumentation Lab	45.9	
4	Food Engineering Lab	45.9	1 (Contractual)
5	Computer Lab	45.9	1 (Regular)
6	Workshop	282.0	4(Regular)+1(Contractual)



**6.4.4.3 List of major equipments, laboratories, farm facilities, workshops and other instructional Units.**

<b>SL. No.</b>	<b>Name of Laboratory/ Facility</b>	<b>List of major equipments and facilities</b>
1.	Post Harvest Engineering Lab	<ol style="list-style-type: none"> <li>1. Dryers (4 Nos.)</li> <li>2. Size Distribution Apparatus (1 Nos.)</li> <li>3. Lab dehusker(1 Nos.)</li> <li>4. Lab polisher (1 Nos.)</li> <li>5. Dehumidifier (1 Nos.)</li> <li>6. Vacuum Packaging Machine(1 Nos.)</li> <li>7. Hot air oven(1 Nos.)</li> <li>8. Vegetable peeler (1 Nos.)</li> <li>9. Grinder (1 Nos.)</li> <li>10. Vegetable slicer (1 Nos.)</li> </ol>
2.	Post Harvest Analytical Lab	<ol style="list-style-type: none"> <li>1. Distillation unit (1 Nos.)</li> <li>2. Titration unit (1 Nos.)</li> <li>3. KjeldahlApparatus(1 Nos.)</li> <li>4. Soxhlet Apparatus (1 Nos.)</li> <li>5. Water bath (Circulating type) (1 Nos.)</li> <li>6. Centrifuge (1 Nos.)</li> <li>7. Magnetic stirrer (1 Nos.)</li> <li>8. Physical balance (3 Nos.)</li> <li>9. Hunter Lab colorimeter (1 Nos.)</li> </ol>
3.	Electrical, Electronics and Instrumentation Lab	<ol style="list-style-type: none"> <li>1. Digital Storage Oscilloscope (2 Nos.)</li> <li>2. National Instruments: NImyRio&amp; NI Elvis II+ (1 Nos.)</li> <li>3. LabView (National Instruments, License No.M83X78684) (1 Nos.)</li> <li>4. Fluke true RMS multimeter(2 Nos.)</li> <li>5. Keithley, DMM6500 (1 Nos.)</li> <li>6. MetraviMultimeter(4 Nos.)</li> <li>7. Function Generator (2 Nos.)</li> <li>8. DC regulated Power Supply (2 Nos.)</li> <li>9. UV Chamber (1 Nos.)</li> <li>10. PCB Fabrication Facility (1 Nos.)</li> <li>11. Different types of Sensors (RTD, Thermocouple, Strain gauge,LM35, Encoder, position sensor, optical sensor etc.) (1 Nos.)</li> <li>12. Testing of DC motor (1 Nos.)</li> <li>13. Testing of single phase, 3 phase induction motor (1 Nos.)</li> <li>14. Testing of DC Generator (1 Nos.)</li> <li>15. Open circuit and short circuit testing of transformer (1 Nos.)</li> </ol>

**6.4.4.3 Cont..List of major equipments, laboratories, farm facilities, workshops and other instructional units**

<b>SL. No.</b>	<b>Name of Laboratory/ Facility</b>	<b>List of major equipments and facilities</b>
4.	Food Engineering Lab	<ol style="list-style-type: none"> <li>1. Texture Analyzer (1 Nos.)</li> <li>2. Water Activity Meter (1 Nos.)</li> <li>3. Portable Moisture Analyzer (1 Nos.)</li> <li>4. Heat Pump Dryer (1 Nos.)</li> <li>5. Fluidized Bed Dryer (1 Nos.)</li> <li>6. Vacuum Dryer (1 Nos.)</li> <li>7. Hot air oven (2 Nos.)</li> <li>8. Solar Assisted Vapour Absorption Refrigeration System (1 set-up)</li> <li>9. Vapour Compression Refrigeration Model(1 Nos.)</li> <li>10. Shell and Tube Heat Exchanger Cut Model(1 Nos.)</li> <li>11. Digital balance (1 Nos.)</li> <li>12. Digital Refractometer(1 Nos.)</li> <li>13. Ultrasonicator(1 Nos.)</li> <li>14. Temperature controlled hot water bath (1 Nos.)</li> <li>15. Digital anemometer (1 Nos.)</li> <li>16. Pyranometer cum datalogger(1 Nos.)</li> </ol>
5.	Computer Lab	<ol style="list-style-type: none"> <li>1. Desktop computers (27 Nos.)</li> <li>2. Printer cum scanner (2 Nos.)</li> <li>3. MatLab software</li> </ol>
6.	Workshop	<ol style="list-style-type: none"> <li>1. Shaper Machine (1 Nos.)</li> <li>2. Milling Machine (1 Nos.)</li> <li>3. Radial Drilling Machine (1 Nos.)</li> <li>4. Pillar Drilling Machine (1 Nos.)</li> <li>5. Lath Machine (3 Nos.)</li> <li>6. CNC Lath Machine (1 Nos.)</li> <li>7. Wood Working Lath Machine (1 Nos.)</li> <li>8. Welding Machine (Electric) (2 Nos.)</li> <li>9. Gas Welding Equipments (1 Nos.)</li> <li>10. Grinding Machines (2 Nos.)</li> <li>11. Wood Working Circular Saw (1 Nos.)</li> <li>12. Wood Working Combination Machine (1 Nos.)</li> <li>13. Power Hacksaw (1 Nos.)</li> <li>14. Bending Machine (1 Nos.)</li> </ol>

**6.4.4.4 Justify whether these facilities are sufficient to meet the course curricula requirement**

The facilities will be sufficient to meet the course curricula requirement if the vacant non-teaching posts will be filled up.



#### 6.4.4.5 Number of theory batches for the Degree Programme

At present total capacity of students in M.Tech. (Processing and Food Engineering) degree programme is 12. The theory classes are being conducted in one batch with maximum 12 students.

#### 6.4.4.6 Number of Practical Batches for the Degree Programme

The practical classes are being conducted in one batch with maximum 12 students.

#### 6.4.5 Conduct of Practical and Hands-on-Training:

The practical classes are being conducted in the functional laboratories of the Department as per the M Tech (Processing and Food Engineering) syllabus. Also some practical classes are being conducted using the following experiential learning module available in the Faculty of Agricultural Engineering.

#### Experiential Learning Module - 1

**Project Title:** Establishment of a Paddy Based Model Agro Processing Centre

**Funded by:** ICAR, New Delhi (2006-07)

**Fund utilized:**Rs. 68.0 Lakhs.

An automatic and fully modernized rice mill of capacity 0.5 tons/h, procured from Satake Corporation, Japan, has been established under the Experiential Learning Programme (Hands on Training).The machines were installed in a shed of size 90ftx30ft constructed from the allocated fund. The practical classes are being conducted for the PG students as per their syllabus.

#### 6.4.6 Supervision of students in PG/PhD Programme:

##### (i) Supervision of students for M Tech (Post Harvest Engineering)

	No. of students and teachers for the M Tech programme in last five years				
	2016-17	2017-18	2018-19	2019-20	2020-21
No. of students in PG programme	0	5	12	7	11
No. of eligible teachers	4	4	4	4	4



## (ii) Supervision of students for M Tech (Food Engineering)

	No. of students and teachers for the M Tech programme in last five years				
	2016-17	2017-18	2018-19	2019-20	2020-21
No. of students in PG programme	2	2	0	0	9
No. of eligible teachers	3	3	3	3	2

### Eligible Criteria to become a PG Advisor:

(Clause 4.08 of the BCKV Regulations regarding Masters' Degree Programme, 2019)

#### 4.08 *Advisement:*

A Chairperson shall be assigned to each student by the Head of the department in consultation with the Board of Studies (BOS) from amongst the internal member of BOS in which the student is registered. The chairperson must be associated with regular post graduate teaching program of the concerned department. The students should be allotted to the Chairpersons following the norm as a laid down below.

- (i) Head of the department, in consultation with the Board of Studies, will prepare a list of eligible teachers according to seniority, keeping continuity of the previous years.
- (ii) Student will not be allotted to the teachers having less than (2) two years of regular service in the Viswavidyalaya at the time of allotment of the student.
- (iii) Student will not be allotted to a teacher when he /she is on lien.

\* Documentary evidence attached as annexure I

### 6.4.7 Feedback of stakeholders:

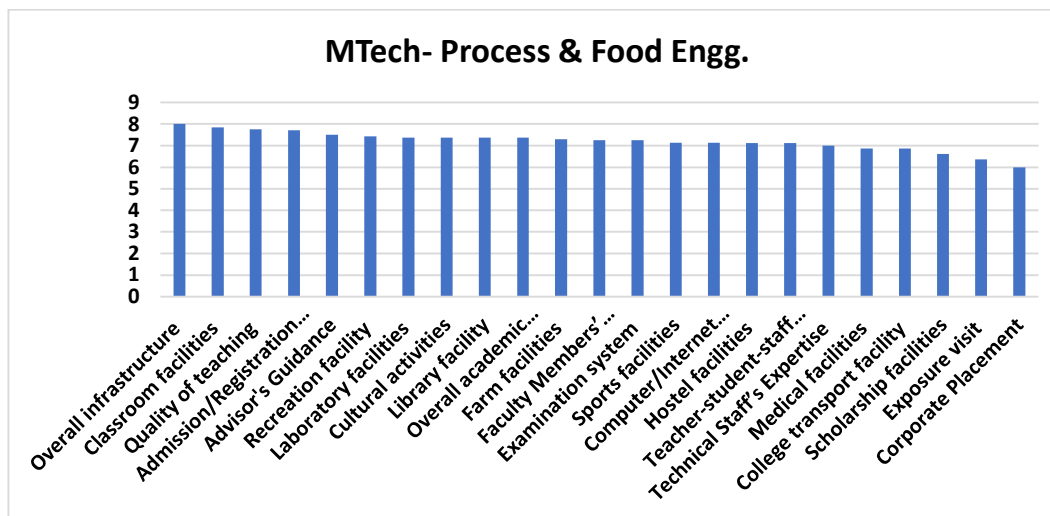
6.4.7.1 Mention the feedback mechanism (duly supported by the documents)

#### *Feedback Mechanism*

Feedback from the students were conducted in Google Forms using standard questionnaire (24 questions) developed on the basis of comprehensive dimension of Agricultural Education in BCKV campus. The dimension covered all the physical and academic facilities provided by the University. The responses were collected on a 10-point scale (1 denotes poorest facility and 10 denotes excellent facility) from the students of this programme. Individual responses were analyzed statistically (by computation of weighted average of every facility as perceived by the students) for the programme and the result was graphically presented in the SSR. As a documentary evidence, individual responses collected from the students' email ID through Google Forms have been stored in our computer (Google



Drive). On demand, of ICAR Peer Review Team, the link for the individual responses can be shared.



**Comment:** Masters' degree students of Process & Food Engineering Programme are content with nearly all the facilities provided by the University. Facilities like Corporate Placement and Exposure Visit have some scope for improvement.

#### 6.4.7.2 What action the University has taken to address the issues raised in the feedback?

##### *Action taken*

The feedback reports were shared with concerned sections of the university. Students responded very positively with regards to majority of the facilities provided by the university. However, with respect to timely publication of results and corporate placement, there are ample scope of improvement. Considering this feedback, the university has taken administrative actions for publication of results within stipulated period as reflected in the circulars of the concerned authorities. As corporate placement, to a great extent, is beyond the purview of the university itself, the Placement Cell continuously in touch with the potential employers to utilize the vacancies in favour of BCKV

##### *Impact*

We are expecting very positive impacts in near future on these issues as some steps have already been taken in recent times as mentioned above.





#### 6.4.8 Student intake and attrition in the programme for last five years:

##### (i) Student intake and attrition in M. Tech (Post Harvest Engineering)

Academic Year	Sanctioned strength	Actual intake	Attrition (%)
2016-17	12	0	0
2017-18	12	5	40
2018-19	12	7	28.6
2019-20	12	0	0
2020-21	12	11	0

The student attrition is high, since some students joined in various Govt./Private jobs before completing the M.Tech. degree.

##### (ii) Student intake and attrition in M. Tech (Food Engineering)

Academic Year	Sanctioned strength	Actual intake	Attrition (%)
2016-17	12	2	0
2017-18	12	0	0
2018-19	12	0	0
2019-20	12	0	0
2020-21	12	9	0

#### 6.4.9 Information Communication Technology Application in Curricula Delivery:

The systematic use of ICT tools in classroom instruction makes the teaching learning process more effective and highly interactive. Generally, in the pre-pandemic condition the use of ICT in our faculty was limited to classroom lecture through power point presentation using LCD projector. Sometimes demonstration of the machineries has been presented to the students through web link, YouTube or using other web services at the time of classroom and laboratory teaching.

The use of ICT tools became more dominant as the pandemic situation started. The institute has to run the teaching and learning process completely in distance mode via electronic networks. The ICT tools used for the curriculum delivery for different theory and practical classes are tabulated below:

Theory	Practical
<ol style="list-style-type: none"><li>1. Google meet, Zoom, Microsoft Team has been used for taking regular classes</li><li>2. E-mail, WhatsApp etc. has been used</li></ol>	<ol style="list-style-type: none"><li>1. Virtual Lab, launched by Ministry of Education under the National Mission on Education through ICT.</li><li>2. Use of YouTube and other web link</li></ol>



<p>for giving lecture notes.</p> <p>3. YouTube is being used for uploading the video lecture</p> <p>4. Use different free web browser for lecture notes</p> <p>5. Use of ICAR E Courses (<a href="https://ecourses.icar.gov.in">https://ecourses.icar.gov.in</a>)</p> <p>6. Use of Google Classroom for assessment purpose.</p>	<p>for demonstrating different practical classes.</p> <p>3. Use of Google meet, Zoom, Microsoft Team etc. for practical purposes.</p> <p>4. Use of Internet of Things (IoT) for sensor based experiments.</p>
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For conducting theory classes the available resources are sufficient, but for the practical classes related to the main course of Processing and Food Engineering, the available resources are not sufficient under virtual laboratory.

I, the Dean, **Prof.ParthaSarathiChattopadhyay**, hereby certify that the information contained in the Section 6.4.1 to 6.4.9 are furnished as per the records available in the college, and degree awarding university.

**Prof. P. S. Chattopadhyay**  
Dean  
Faculty of Agril. Engineering  
Bidhan Chandra Krishi Viswavidyalaya  
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**Plac: Mohanpur**

**Date: 02-11-2021**

**(Signature of Dean of the Faculty with Date & Seal)**

