

6.4 Self-Study Report for the Post Graduate Programme

Faculty of Agricultural Engineering, Mohanpur, BCKV

A. Name of the Programme: M. Tech. Farm Machinery and Power Engineering

6.4.1 Brief History of the Programme:

The degree programme of M. Tech. (Farm Machinery and Power Engineering, FMPE) started in the year 2011 under the Faculty of Agricultural Engineering, BCKV, Mohanpur, West Bengal. The discipline of Agricultural Engineering started with the concept of application of the principles of farm machinery and power system in the field of agriculture for improving the efficiency of different inputs, reducing drudgery of agricultural workers and maintaining timeliness of different farm operations.

Specific Objectives:

- To impart education and entrepreneurial skills in design, development, manufacturing, testing and field operation of different agricultural equipments and technologies for enhancing the crop production.
- To increase the profitability through efficient use of different agricultural inputs and natural resources, including different forms of renewable energy sources.
- To conduct research on development of farm equipments and technologies for mechanizing various farm operations.

Besides offering core courses related to farm power sources and farm equipments to B. Tech, M. Tech and PhD programmes, the department also offers basic engineering courses like Workshop Technology, Engineering Mechanics, Computer Aided Design and Manufacturing, and Renewable Energy Sources. The department also caters courses to the UG students of the Faculty of Agriculture and the Faculty of Horticulture.

Since inception, the department is engaged with research and extension activities for effective implementation of much needed farm mechanization in West Bengal. The department has developed few appropriate implements and machineries useful for small and marginal farmers.



Programme Accomplishment:

- In the last 5 years, thirty (30) students successfully completed M Tech degree.
- Some students have joined jobs under State Govt., banks and NGOs and some passed out students have joined different private organizations.
- Few students have joined PhD programme under this department with University Research Fellowship.
- Few power tiller operated agricultural equipments like potato planter, bund former, manually operated weeder etc. have been developed under the project work of M Tech students.

6.4.2 Faculty Strength:

Sl. No.	Faculty Designation	Sanctioned posts	Faculty in Place*	Vacant Position	Faculty recommended by the ICAR
1	Professor	1	0	1	1
2	Associate Professor	1	1	0	2
3	Assistant Professor	2	2	0	3
Total		4	3	1	6

At present Faculty in Place are 3 compared to the requirements of 6 as per ICAR Vth Deans' Committee recommendation. Hence, some courses of M.Tech. (FMP) are being covered by Er. P.K. Dhara, a Mechanical Engineer serving as Secretary, UG/PG Council, Faculty of Agricultural Engineering. The detailed courses taken by Er. P.K. Dhara are given below:

Er. Prabhat Kumar Dhara; FIE (Mechanical); Secretary, Faculty Council, F/Agril. Engineering, BCKV			
Course No.	Courses catered in M. Tech. Course. In Agril. Engg - Farm Machinery and Power.	Semester	Credit Hours
FMP-555	Applied Instrumentation in Farm Machineries and Stress Analysis	Semester-II	3(2+1)

6.4.3 Technical and Supporting staff:

Units/ Departments	Sanctioned staff	Staff in Place	Vacant Position	Staff strength recommended by the ICAR
Department. of Farm Machinery and Power Engineering	7	1	6	5
Workshop	14	4	10	27
Total	21	5	16	32

*Staff details of each unit are given below.



(A) Staff details of Department of Farm Machinery and Power Engineering

Sl. No.	Name of the Post	Number of Sanctioned
1.	Mechanical Overseer	1
2.	Sr. Mechanic Gr- II	1
3.	Mechanic	1
4.	Drafts man (Mechanical) Mechanic cum Operator	1
5.	Tractor Driver	1
6.	Power Tiller Operator	1
7.	Jr. Peon	1
Total		7

(B) 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
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
Total		14

At present Staff in Place are 5 compared to the requirements of 32 as per ICAR Vth Deans' Committee recommendation. Hence, the M.Tech. (FMP) 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.	Farm Machinery & Power Engineering	Tractor Driver – 1 No. Power Tiller Operator- 1 No.

***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 Programme (Farm Machinery and PowerEngineering):

Class room for	No. of class rooms	Area (Square-metre)	Sitting capacity
1 st Year M.Tech.	1	76.19	30
2 nd Year M.Tech.	1	19.36	15

The Department has been equipped with 2 (Two) numbers of class rooms, which are sufficient for conducting M Tech (Farm Machinery and Power Engineering) classes.

6.4.4.2. Number of Functional Laboratories:

Sl No.	Name of Laboratory/ Facility	Area (Square-metre)	No. of Supporting Staff Attached
1	Farm Machinery Lab	282.0	1(Contractual)
2	Farm Power Lab	243.6	1(Regular)
3	Farm Machinery and Power Testing Lab	243.6	1(Contractual)
4	Computer Lab	45.9	1(Regular)
5	CAD/ CAM Lab	45.9	
6	Workshop	282.0	4(Regular)+ 1(Contractual)
7	Instructional Farm	17500.0 (1.75 ha)	1(Contractual)

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

SL. No.	Name of Laboratory/ Facility	List of major equipments and facilities
1.	Farm Machinery Laboratory	1. Slasher/Rotary harvester (1 Nos.) 2. Cultivator (1 Nos.) 3. Disc Plough (1 Nos.) 4. Mold board plough(1 Nos.) 5. Disc Harrow (2 Nos.) 6. Hydraluic Harrow (1 Nos.) 7. Zero Till Seed Drill (5 Nos.) 8. Power Chaff Cutter (1 Nos.) 9. Multi crop Thresher (3 Nos.) 10. Drum Seeder (1 Nos.) 11. Paddy Transplanter (1 Nos.) 12. Power Reaper (V.C.R.) (1 Nos.) 13. Pedal operated Thresher (4 Nos.) 14. Potato Planter (2 Nos.) 15. Potato Digger (1 Nos.) 16. Universal Testing Machine (UTM) (1 Nos.) 17. Air Compressor (1 Nos.) 18. Rotavator (1 Nos.) 19. Pneumatic Planter (One) (1 Nos.)



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

SL. No.	Name of Laboratory/ Facility	List of major equipments and facilities
2.	Farm Power Laboratory	<ol style="list-style-type: none"> 1. 35 hp Tractor, International make, B275 (1 Nos.) 2. Mahindra (Sarpanch) Tractor, 585 DI , 50 hp (One) 3. Two wheel Trailer (3 Ton Capacity) (1 Nos.) 4. John Deere Tractor, 65hp (1 Nos.) 5. Mistubishi Shakti Mini Tractor, MT-180D, 18hp (1) 6. Kubota Power Tiller 12hp (1 Nos.) 7. VST Shakti Power Tiller, 130 Di, 13hp (1 Nos.) 8. Power Tiller Operated Trailer (1.5 Ton Capacity) 9. Power tiller Operated Cultivator (1 Nos.) 10. Power tiller Operated Mould board plough (One) 11. Water Pump (1 Nos.) 12. Mini Combine Harvester (1 Nos.)
3.	Farm Machinery and Power Testing Laboratory	<ol style="list-style-type: none"> 1. Mechanized Soil Bin (1 Nos.) 2. Diesel Engine Test Rig, Single Cylinder, 5hp (One) 3. Direct Shear Testing Machine(1 Nos.) 4. Blow Machine (1 Nos.) 5. Sprayer (2 Nos.) 6. Power Reaper (1 Nos.) 7. IC Engine, Cut Model (1 Nos.)
4.	Computer Laboratory	<ol style="list-style-type: none"> 1. Desktop computers (27 Nos.) 2. Printer cum scanner (2 Nos.) 3. MatLab software
5.	CAD/ CAM Laboratory	<ol style="list-style-type: none"> 1. Work stations (14 Nos.) 2. Plotter (1 Nos.)
6.	Workshop	<ol style="list-style-type: none"> 1. Shaper Machine (1 Nos.) 2. Milling Machine (1 Nos.) 3. Radial Drilling Machine (1 Nos.) 4. Pillar Drilling Machine (1 Nos.) 5. Lath Machine (3 Nos.) 6. CNC Lath Machine (1 Nos.) 7. Wood Working Lath Machine (1 Nos.) 8. Welding Machine (Electric) (2 Nos.) 9. Gas Welding Equipments (1 Nos.) 10. Grinding Machines (2 Nos.) 11. Wood Working Circular Saw (1 Nos.) 12. Wood Working Combination Machine (1 Nos.) 13. Power Hacksaw (1 Nos.) 14. Bending Machine (1 Nos.)
7.	Instructional Farm	<ol style="list-style-type: none"> 1. Drip Irrigation system 2. 5 HP submersible pump set-up 3. Solar water pumping system



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 teaching and non-teaching post are filled up.

6.4.4.5 Number of theory batches for the Degree Programme

At present total intake capacity of students in M Tech. (Farm Machinery and Power 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 syllabus of M. Tech. (Farm Machinery and Power Engineering).

The following facilities created under experiential learning programme are also used for PG students' practical purposes.

Experiential Learning Module - 1

Project Title: Experiential teaching and learning under Hands on Training on “Maintenance and custom hiring of Farm Machinery and equipments”

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

Fund utilized: Rs. 18.0 Lakhs

Experiential Learning Module - 2

Project Title: Experiential teaching and learning under Hands on Training on “Design, Fabrication and Testing of Farm Machinery”

Funded by: ICAR, New Delhi (2008-09)

Fund utilized: Rs. 180.0 Lakhs.

Research works are conducted to improve the performance of various agricultural equipments using the developed facilities by simulating actual field conditions in the Mechanized Soil Bin under controlled laboratory conditions. This facility created under the same ELP facilitates the research work in Post Graduate level.



6.4.6 Supervision of students in PG/PhD Programme:

(i) Supervision of students for M. Tech (Farm Machinery & Power 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	3	13	22	17	16
No. of eligible teachers for guiding the PG students in Department	4	4	4	3	3

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:

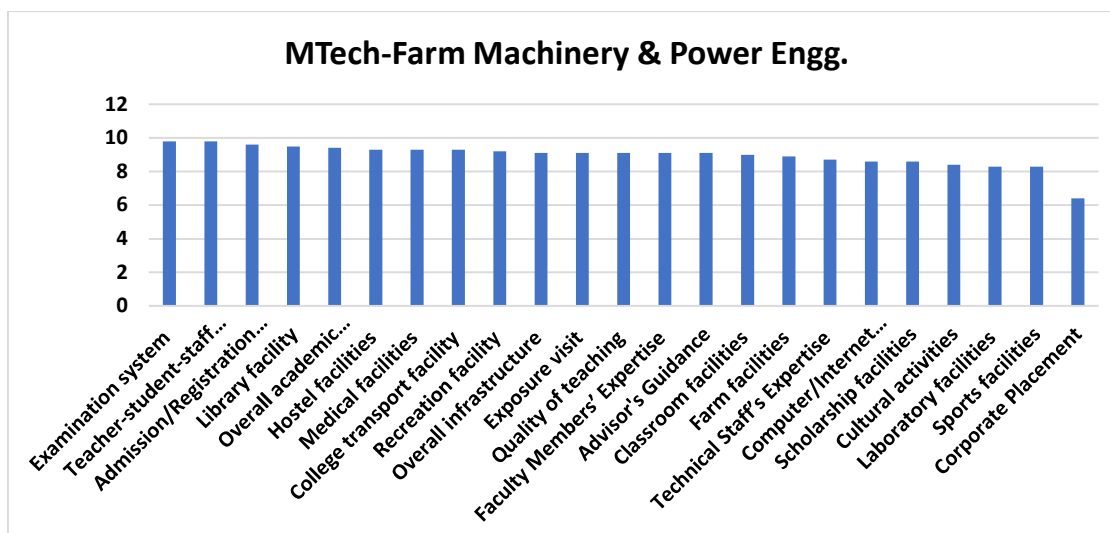
6.4.7.1 Mention the feedback mechanism

Feedback Mechanism

Feedback from the students was 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 Farm Machinery and Power Engineering Programme are extremely happy with nearly all the facilities provided by the University. Corporate Placement has room 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 scopes 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:

Academic Year	Sanctioned strength	Actual intake	Attrition (%)
2016-17	12	3	0
2017-18	12	10	0
2018-19	12	12	0
2019-20	12	5	40
2020-21	12	11	0

6.4.9 Information Communication Technology (ICT) 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">1. Google meet, Zoom, Microsoft Team has been used for taking regular classes2. E-mail, Whatsapp etc. has been used for giving lecture notes.3. University website is being used for uploading the video lecture4. Use different free web browser for lecture notes5. Use of ICAR E Courses (https://ecourses.icar.gov.in)6. Use of Google Classroom for assessment purpose.	<ol style="list-style-type: none">1. Virtual Lab, launched by Ministry of Education under the National Mission on Education through ICT.2. Use of YouTube and other web link for demonstrating in different practical classes.3. Use of Google meet, Zoom, Microsoft Team etc. for practical purposes.4. Use of Internet of Things (IoT) for sensor based experiments.

For conducting theory classes the available resources are sufficient, but for the practical classes related to the main course of Agricultural Engineering, the available resources are not sufficient under virtual laboratory.

I, the Dean, **Prof. Partha Sarathi Chattopadhyay**, 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
Mohanpur-741252, Nadia, W.B.

Place: Mohanpur

Date: 02-11-2021

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

