Annual Report
2017-18

Department of Processing and Food Engineering

Complied by Sunil Kumar, V.K. Singh, M.K. Garg

CCS Haryana Agricultural University, Hisar Haryana -125004

PREFACE

Globally, one-third of the produced food for human consumption is wasted or lost as per FAO study. Food waste is acknowledged as a global problem that needs to be solved on the way to achieve sustainable development of humankind. As per an independent post-harvest losses study in CIPHET, Ludhiana estimated 6.70-15.8% of fruits and 4.58-12.44% of vegetables were lost annually during various unit operations. Post-harvest losses of food are not restricted to developing countries like us only. Many of the other countries are still struggling to prevent losses by modernizing and upgrading their supply chains. The waste is started from the field and continues up to the consumption. Therefore, the techniques and employed methods for reducing waste and loss used in field, transportation, storage and processing. Adoption of post-harvest technology and growth of food processing industries are inter-related as post-harvest management increases the shelf life of fruits and vegetables and feed more to the agro processing industries. Agricultural productivity augmentation needs a concurrent development of post-harvest support mechanism including normal and cold storage facilities, packaging facilities, agro processing industries, crop sterilization and sanitation facilities and an effective marketing reach to global markets. Food processing adds value to the agricultural, horticultural, livestock and fisheries products by using various techniques like grading, sorting and packaging, etc. which enhances their shelf life. It leads to diversification of agricultural activities, improves value addition opportunities and creates surplus for export of agro food products. Due to heavy post-harvest losses, there exists a considerable gap between gross production and net availability to the consumers. The post-harvest losses start in the farm and travel along procurement chain and entire marketing channel.

As in the last year, department has made tremendous progress during this year. It has been possible due to active support from the Officers of the University and dedicated faculty and supporting staff of the department. I sincerely thank **Dr. K.P. Singh**, Vice-Chancellor; **Dr. R.K. Jhorar**, Dean, COAE&T; **Dr. S.K. Sehrawat**, Director of Research for their continuous support and encouragement.

I admire the efforts put up by **Er. Sunil Kumar** and **Dr. V.K. Singh** in compilation of this report. Constructive comments and feedback to improve the contents of annual report will be welcomed.

(M.K. Garg)

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Department of Processing & Food Engineering

Dr. M.K. Garg

Objectives

- Imparting education in the field of Processing & Food Engineering to both undergraduate students i.e. B.Tech. (Agril. Engg.)/B.Sc.(Hons.) Ag. and post graduate students i.e. M.Tech. (Agril. Engg.) with specialisation in Processing & Food Engineering and Ph.D. in Processing & Food Engineering
- Advancement of learning and prosecution of research in the field of Processing & Food Engineering.
- Undertaking Extension activity for farmers in the field of Processing & Food Engineering

Emerging/Thrust Area

- Development of crop specific post harvest techniques for reduction in quantitative & qualitative losses of farm produce.
- Development of machines for different post harvest unit operations.
- Reduction in post harvest losses.
- Income and employment generation through Agro-Processing Centers in rural areas -Hermetic storage of grains (wheat).
- Testing and poularization of Agro-processing equipments/ technologies suitable for Haryana state.

Faculty Members (as on 30.06.2018)

Dr. M K Garg,
Professor & Head
Ph.D.: ICAR-IARI, New Delhi
Specialization: Agricultural Processing & Structures

Dr. D K Sharma,
Associate Professor
Ph.D.: IIT, Delhi
Specialization: Processing and Food Engineering

Dr. Ravi Gupta,
Senior Scientist, Incharge AICRP
Ph.D.: IIT, Delhi
Specialization: Agricultural Processing & Structures

Dr. V K Singh,
Assistant Professor
Ph.D.: JNKVV, Madhya Pradesh
Specialization: Processing and Food Engineering

Er. Sunil Kumar,
Senior Scientist
M.Tech.: CCS HAU, Hisar, Haryana
Specialization: Agricultural Processing & Structures

Er. Arun Kumar,
Assistant Professor
M.Tech.: CCS HAU, Hisar, Haryana
Specialization: Processing and Food Engineering

Dr. Nitin Kumar,
Assistant Professor
Ph.D.: PAU, Punjab
Specialization: Processing and Food Engineering

Schemes in operation (2017-18)

Sr. No.	Name of the Scheme	Scheme No.	Budget Allotted (Rs. Lakhs)	Expenditure (Rs. Lakhs)
1.	Teaching	T-8 Agri(B)-State		
2.	Testing & popularization of small scale agricultural processing equipments for their adoption in Haryana State	C(a) APE-I-Plan-Agri.	2.65	1.67
3.	AICRP on Post Harvest Engineering &Technology (AICRP on PHET)	C(b) APE-1-ICAR	63.87	46.19

Scheme-wise Staff position (Teaching & Non-Teaching) (as on 30.06.2018)

Sr. No.	Name of the sanctioned post	Pay band + GP	Name of the employee working against the post	Date of joining CCSHAU	Date of retirement
Name of the Scheme: T-8 Agri (B)-State					
1	Professor	37400+10000 GP	Dr. M.K. Garg	06.11.1985	30.09.2020
2	Assoc. Prof.	15600+8000GP	Dr. D. K. Sharma	20.03.1989	30.11.2024
3	Asstt. Prof.	15600+7000GP	Dr. V.K. Singh	22.08.2009	30.06.2037
4	Asstt. Prof.	15600+6000GP	Er. Arun Kumar Attkan	31.07.2017	30.11.2048
5	Asstt. Prof.	15600+6000GP	Dr. Nitin Kumar	04.07.2018	31.12.2049
6	Clerk*	5200+1900GP	Vacant		-
7	Lab Asstt	5200+1900GP	Smt. Savita**	25.04.1994	30.06.2034
8	Messenger	4440+1300GP	Vacant	-	-
9	Tracer	5200+2000GP	Vacant	-	-

C(b)APE-1-ICAR					
1	Sr. Scientist	37400+9000GP	Dr. Ravi Gupta***	23.03.2018	-
2	Asstt Scientist	15600+6000GP	Er. Sunil Kumar	16.08.2017	31.10.2050
3	Asstt Sci.(FT)****	15600+6000GP	Vacant	-	-
4	Mechanic	5200+2400GP	Sh. Mahadev*****	02.02.1996	29.02.2024
5	Lab. Asstt.	5200+1900GP	Sh. Ravi Kant	09.06.2003	28.02.2045
6	Clerk	5200+1900GP	Sh. Sarjit	01.04.1993	31.03.2030
7	Welder	5200+1800GP	Sh. Gopi Ram	01.04.1993	31.03.2028

***** Sh. Sajjan Kumar reemployed against the post
******Transferred to CFST on 22.09.2018 after her promotion.
*******Joined on 24.3.18 as Senior Scientist (Agricultural Structures and Process Engineering) in AICRP on Post Harvest Engineering and Technology{c(b)-APE-ICAR scheme}
****Dr. Kanika Pawar worked as Asstt. Sci. upto 01.12.17 and transferred to RRS, Karnal
*********Sh. Mahadev was promoted as mechanic w.e.f 24.07.17

M. Tech. Students on roll (2017-18)

Sr. No.	Name	Admn. No.
1	Rihan Patel	2017AE1M
2	Sapna	2017AE03M
3	Ravi Kumar	2017AE04M
4	Charan Singh	2017AE06M
5	Sushant Bhardwaj	2017AE01D
6	Raveena	2017AE02D

M.Tech. Students who completed their degrees during 2017-18

Sr. No.	Name (Admn. No.)	Title of thesis	Name of the Advisor
1	Aswini S.C. (2016AE01M)	Effect of ohmic heating on oil recovery from rice bran	Dr. M.K. Garg
2	Sachin (2016AE02M)	Effect of microwave heating on extraction of essential oil from turmeric (Curcuma longa L.)	Dr. V.K. Singh
3	Annu (2016AE04M)	Techno-economic Evaluation of Solar Biomass Shredder	Dr. Yadvika*

*****PG faculty from Deptt of Renewable and Bio Energy Engineering

Students' Achievements (JRF/NET/ARS)

- Sushant Bhardwaj cleared ASRB NET-2018.

Courses taught (2017-18)

UG Courses

S.No.	Course No.	Course Title	Credit hours	Course Instructor
SEMESTER-I				
1	PFE 201	Engineering Properties of Biological Materials and Food Quality	2+1	Dr. V. K. Singh
2	PFE 301	Dairy and Food Engineering	2+1	Dr. D. K. Sharma
3	PFE 304	Protected Cultivation & PHT	1+1	Er. Arun Kumar Attkan/Dr. D. K. Sharma
4	PFE 402	Design and Maintenance of Green House	2 + 1	Er. Sunil Kumar
5	PFE 403	Food Packaging Technology	2 + 1	Er. Sunil Kumar
6	PFE 411	Project on Processing and Food Engineering - 1	2 + 1	Dr. M.K. Garg, Dr. D.K. Sharma,Dr. V.K. Singh, Er. Sunil Kumar, Er. Arun Kumar Attkan
7	TUT	Tutorial (NC)	1+0	Dr. D.K. Sharma, Dr. V.K. Singh, Er. Sunil Kumar, Er. Arun Kumar Attkan
SEMESTER-II				
1	FE 202	op Process Engineering	1	. D.K. Sharma
3	PFE 302	Agricultural Structures & Environmental Control	2+1	Dr. M.K. Garg
4	PFE 303	Drying and Storage Engineering	2+1	Er. Sunil Kumar
6	PFE 410	Hands on Training in Processing of Agricultural Produce	0+3	Dr. V.K. Singh/Dr. D.K. Sharma
7	PFE 412	Project on Processing and Food Engineering – 1I	0+3	Dr. M.K. Garg, Dr. D.K. Sharma,Dr. V.K. Singh, Er. Sunil Kumar, Er. Arun Kumar Attkan
8	TUT	Tutorial (NC)	1+0	Dr. D.K. Sharma, Dr. V.K. Singh, Er. Sunil Kumar, Er. Arun Kumar Attkan
9	PFE 391	Under-graduate seminar	0+1	Dr. V.K. Singh/ Dr. D.K. Sharma
10	PFE 390	Summer Training-I	0+3	Dr. D. K. Sharma
11	PFE 490	Summer Training-II	0+3	Dr. D. K. Sharma

PG Courses

S.No.	Course No.	Course Title	Credit hours	Course Instructor
		SEMESTER-I		
1	PFE 502	Engineering Properties of Biological Materials	2+1	Dr. V.K. Singh
2	PFE 504	Farm Structures & Environmental Control	2+1	Dr. M.K. Garg
3	FST 505	Food Packaging	2+1	Dr. M.K. Garg/Dr. Kanika Pawar*
4	PFE 599	Master's Research	-	PG faculty
		SEMESTER-II		
1	PFE 501	Transport Phenomena in Food Processing	2+1	Dr. D.K. Sharma
2	PFE 514/SST 507	Seed Drying, Processing & Storage	2+1	Dr. V.K. Singh
3	FST 503	Food Engineering	2+1	Dr. M.K. Garg/Er. Sunil Kumar
4	PFE 601	Textural & Rheological Characteristics of Food Materials	2+1	Dr. V.K. Singh
5	PFE 513	Storage Engineering & Handling of Agricultural Products	2+1	Dr. M.K. Garg/Er. Sunil Kumar
6	PFE 605	Agricultural Waste and By Product Utilization	2+1	Dr. Yadvika/Er. Sunil Kumar
7	PFE 595	Industry/Institute Training	0+1	Dr. D.K. Sharma
8	PFE 599	Master's Research	-	PG Faculty
9	PFE 591	Master's Seminar	0+1	Dr. D.K. Sharma
10	NSS	National Service Scheme	-	Dr. D.K. Sharma

* Transferred to RRS, Karnal

New Projects submitted

Sr. No.	Title of the project	Principal Investigator/Co-PI	Amount (lakhs)	Funding agency	Status
1.	Development of cellulose based flexible bio-films from rice straw for food packaging applications	Dr. Nitin Kumar (PI) Dr. M.K. Garg (Co-PI)	19.20	DST SERB	Under consideration
2.	Skill development and processing of agri-produce for its utilization and value addition to encourage agri-entrepreneurs	Dr. Rajbala Grewal (PI) Dr. M. K. Garg (Co-PI) Dr Rajesh Gera (Co-PI)	200	RKVY-RAFTAAR	Sanctioned

3.	Development and popularization of eco-friendly technologies for paddy straw management	Dr. K. P. Singh (PI) Dr. M. K. Garg (Co-PI) Dr. Kamla Malik (Co-PI) Dr. Yadvika (Co-PI) Er. Anil Kumar (Co-PI)	610	RKVY	Ongoing

Research achievements

- The hand operated maize sheller was designed, developed and tested for its performance and operational cost of this machine. The machine capacity, cleaned grain and damaged grain were found 50 kg/h, 98.74% and 1.01% respectively at 9% moisture content of cobs. Operational cost of the machine was Rs 68.93/h.
- The hand operated Aloe-vera gel extraction machine was tested for its performance and cost economy. The machine capacity and gel extraction recovery were found 17 kg/h and 81.82% respectively while the operational cost of the machine was Rs. 67.11/h.
- The turmeric rhizome washing machine was tested for its performance and cost economy. The machine capacity and washing efficiency were found 85.7 kg/h and 92% respectively. The operational cost of the machine was Rs. 72.5/h.

Hand Operated maize sheller

Aloe-vera gel extraction machine

Aloe-vera gel

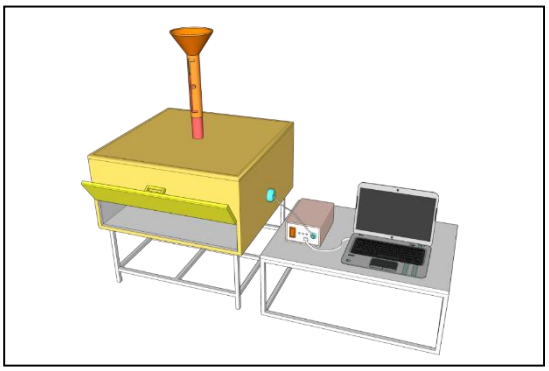
Turmeric rhizome washer

Washed turmeric rhizome

- FSSAI license number for the spice powder in Agro Processing Centre was obtained.

Logo of product with FSSAI License number

- A good correlation of dimensions and weight based detection of juice content in the kinnow fruits was found. Correlation of dimensions of kinnow and the weight with the juice content was good (0.88), the coefficient of determination of modelling for juice content by kinnow dimensions and weight was above 0.78.Coefficient of determination for dimension X and the weight of kinnows (two independent variable) with the juice content was 0.77.



CAD diagram of Acoustic setup

Developed setup of acoustic sensor along with the PC based data logging system in a sound insulated box.

Sound insulated box

PC based data logging system

Sensor placement inside the sound insulated box.

- Techno-economic evaluation of 1kW solar power plant for electricity generation. The performance of 1kW solar power plant was evaluated round the year at the lab and also at two user's site. Renewable Energy Lab of the department is running efficiently on this 1kW solar power plant. Around 3-4 units of electricity were produced in the summer and autumn months while around 2-3 units were produced in the winter months. Around 1300-1500 units of electricity were produced on an annual basis.
- Development of motor operated portable unit for separation of earthworm and vermicompost. Power operated earthworm separator was developed for continuous operation with higher capacity. It was found to be efficient for separating earthworms from the vermicompost on continuous basis as all earthworms were collected at the outlet and no earthworms were killed during the testing of machine.
- Development of a solar operated kit for small domestic appliances. Solar kit operating on 100W solar panel was developed in the department and was found to be effective and efficient for running small domestic appliances like room cooler, madhani, inverter and mobile charger.
- Techno-economic evaluation of Solar Mini Cold Storage. It was tested at no load and at load conditions throughout the year. It was observed that at no conditions, it consumed around 2-3 units in winter and 3-4 units in summer on daily basis. While under load conditions (3 tons of potatoes), it consumed around 9-15 units of electricity from solar as well grid per day.
- Vermicompost preparation using different concentrations of paddy straw in portable vermibeds
  Vermibed having a mixture of cattle dung and paddy straw in the ratio of 1:7 contained 22.25% Organic carbon, 1.20% Nitrogen, 0.81% Phosphorus, 0.66% Potassium and C: N ratio of 18.54. However, the vermicompost prepared from cattle dung only contained only 20.03% Organic carbon, 1.24 % Nitrogen, 0.93% Phosphorus, 0.64% Potassium and C: N ratio of 16.15.
- The construction of biogas plant along with a customized organic fertilizer unit and biochar unit based on paddy straw and other agro-residues is under progress.
- The total source-wise energy consumption in pearl millet crop production increased with the size of land holdings in both irrigated and rainfed areas. It was found to be more in case of farmers of the rainfed region than irrigated ones indicating the higher use of energy by them. Energy consumption at HAU farm was similar to the small and medium farmers of rainfed area but less than the large farmers.
- Demonstration and evaluation of fixed dome type 4m3 high TSC cattle dung based biogas plants in the selected farmer's site: Small capacity biogas plants (4m3 capacity) are useful for biogas production at household level even in winter season and can successfully replace LPG for day to day cooking requirements.
- Energy Auditing of a Village: All categories of households in rural area consumed maximum energy (87.48 to 90.20%) in cooking. The highest energy consumption in cooking was by medium farmers and the lowest was by small farmers.

Students Project work (UG) – 2018 (Updated on 30.06.2018)

Sr. No.	Name of the student (Admission No.)	Title of the Project Report	Advisor (Dr.)
1.	Vijay (2015 AE39B(L)II)	Fabrication and Performance Evaluation of Hand Operated Maize Sheller	M.K. Garg
2.	Chandermohan (2014AE07BIV)	Performance Evolution of Honey Heating cum Filtration Machine	D.K. Sharma
3.	Praveen Kumar (2014AE25BIV)	Development of Low Cost Pack House for Aonla, Ber and Carrot	D.K. Sharma
4.	Parveen 2014AE22BIV	Techno-economic Evaluation of Solar Mini Cold Storage	Yadvika
5.	Rekha (2014AE28BIV)	evelopment of Power Operated Earthworm Separator	Yadvika
6.	KrishanKanahiya (2014AE14BIV)	Development and Evaluation of Ohmic Heater	V.K. Singh
7.	Vipin Kumar 2015AE40B(L)II	Performance evaluation of hand operated Aloe vera gel extraction machine and turmeric washing cum peeling machine	V.K. Singh
8.	Shashank Sharma (2015AE38B(L)II)	Performance Evaluation Of Biomass Shredder Cutter Assembly	Arun Kumar Attkan
9.	Gurvinder Singh (2014AE11BIV)	Energy Auditing and Utilization Status in Rural Household	Arun Kumar Attkan
10.	NiteshPingal (2014AE20BIV)	Impact of Waxing and Various Treatments on Storability of Kinnow Fruits	Sunil Kumar
11.	Deepak (2014AE10BIV)	Quantification of Juice in Kinnow Fruit by Acoustic Technology	Sunil Kumar

Publications (2017-18)

Research Papers

- Panchal, Indu, Sawhney, I.K., Sharma, A.K., Garg, M.K. and Dang, A.K. (2017). Mastitis detection in Murrah buffaloes with intelligent models based upon electro-chemical and quality parameters of milk. Indian Journal of Animal Research, 51(5):922-926. (NAAS rating – 6.15)
- Vijay K Singh (2017) Testing and evaluation of CFTRI Dal mill for pigeonpea (UPAS 120). *Journal of Food Legumes* 30(2): 83-86. (NAAS Ratting: 4.97)
- Sushant Bhardwaj, Yadvika, Satykaam Malik, V.K. Singh and Amandeep Singh (2018) Performance evaluation of Desiccant seed dryer for drying Fenugreek (Trigonellafoenum-graecum) seeds. International Journal of Education and Management Studies. Vol. 9(2), 249-252. (NAAS Ratting: 4.79)
- Vijay K Singh (2017) Testing and evaluation of Pedal operated potato peeler. *International Journal of Agricultural Engineering,* Volume 10 ,Issue 2, 1-9.(NAAS Ratting: 4.43)
- Mohapatra, D., Kumar, S., Kotwaliwale, N., & Singh, K. K. (2017). Critical factors responsible for fungi growth in stored food grains and non-Chemical approaches for their control. *Industrial Crops and Products*, *108*, 162-182 (NAAS RATING 9.15).
- Sushant, Yadvika, Arun Kumar Attkan and Naveen (2018) Performance evaluation and testing of low cost portable-type improved cook stoves, Journal of Pharmacognosy and Phytochemistry, 7(3): 2363-2370 (NAAS Rating: 5.21)

Popular Articles

- Sushant Bhardwaj, Yadvika, M.K. Garg (2017). Grid se juda chotte paimane ka: Saur pvsanyantra (Small scale grid connected solar PV plant). Haryana Kheti, October 2017, Issue 10, Page: 22, 25.
- Sunil Kumar, Pave lSomavat and MK Garg (2018). "Vayu-rodhi bag – anaj bhandarn ke liye ek Javik aur prabhbi technique" for Hindi magazine "Jighasa" of Hindi Cell, IIT Delhi. (Accepted)
- Sushant Bhardwaj, Yadvika, V.K.Singh (2017) Solar Desiccant Seed Dryer. Haryana Kheti, Issue 10, Page: 11-12.
- Darshana Duhan, Dharmendra Singh, DK Sharma (2018). Krishi Shetra me Sudoor Savedhan Takneekka Proyog. Haryana Kheti. 51(2). 9-10.

Abstracts Published

- Arun Kumar Attkan, D K Sharma, M. K. Garg, V K Singh, Sunil Kumar, Kanika Panwar(2018) Low cost portable type natural-ventilated storage structure for onions (Allium cepa L.). 52 nd Annual Convention of ISAE scheduled for 08–10 January at Anand Agricultural University, Anand, Gujarat.
- Arun Kumar Attkan and Y. K. Yadav (2018) Experimental studies on desiccant assisted dryer for leafy vegetables. 52 nd Annual Convention of ISAE scheduled for 08–10 January at Anand Agricultural University, Anand, Gujarat.
- Vijay K. Singh, Yadvika, M. K. Garg (2017). Processing of potato using pedal operated potato slicer for value addition. Golden Jubilee International Conference on 'Gender Issues and Socio-Economic Perspectives for Sustainable Rural Development' GIRD-2017 (October 23-25,). Pp 118-119.
- Yadvika, V. K. Singh, M. K. Garg (2017). Value added product preparation using Natural draft improved solar dryer. Golden Jubilee International Conference on 'Gender Issues and Socio-Economic Perspectives for Sustainable Rural Development' GIRD-2017 (October 23-25,). Pp 124.

- Sushant Bhardwaj, Yadvika, M. K. Garg and V. K. Singh (2017). Performance evaluation for utilization of Spent Mushroom Substrate (SMS) in biogas plant. Golden Jubilee International Conference on 'Gender Issues and Socio-Economic Perspectives for Sustainable Rural Development' GIRD-2017 (October 23-25,). Pp 139.
- Kanika Pawar, M. K. Garg, D.K.Sharma and V. K. Singh, , (2017) Quality assessment of Honey obtained from heating cum filration machine. Golden Jubilee International Conference on 'Gender Issues and Socio-Economic Perspectives for Sustainable Rural Development' GIRD-2017 (October 23-25,). Pp 116.
- Vijay K. Singh, Yadvika and M.K.Garg (2018). Performance evaluation of pedal operated potato slicer. 52nd Annual Convention of Indian Society of Agricultural Engineers (ISAE) and National Symposium on "Doubling Farmers' Income through Technological Interventions" at Anand Agricultural University, Anand (Gujarat) from January 8-10, 2018, Pp 93.
- Sushant Bhardwaj, Yadvika, Arun Kumar, M.K.Garg and V.K.Singh (2018). Performance and testing of low cost portable type improved biomass cookstove. 52nd Annual Convention of Indian Society of Agricultural Engineers (ISAE) and National Symposium on "Doubling Farmers' Income through Technological Interventions" at Anand Agricultural University, Anand (Gujarat) from January 8-10, 2018, Pp 306.
- Yadvika, V.K.Singh, M.K.Garg and Rajender (2018). Performance evaluation of natural draft improved solar dryer. 52nd Annual Convention of Indian Society of Agricultural Engineers (ISAE) and National Symposium on "Doubling Farmers' Income through Technological Interventions" at Anand Agricultural University, Anand (Gujarat) from January 8-10, 2018, Pp 316.
- Arun Atkaan, D.K. Sharma, M.K. Garg, V. K. Singh, Sunil Kumar and KanikaPanwar (2018). Low cost portable type natural-ventilated storage structure for onion(Allium cepa L.) 52nd Annual Convention of Indian Society of Agricultural Engineers (ISAE) and National Symposium on "Doubling Farmers' Income through Technological Interventions" at Anand Agricultural University, Anand (Gujrat) from January 8-10, 2018, Pp 79.
- Ashwani and V.K. Singh (2018) Performance evaluation Spice grinder. 52nd Annual Convention of Indian Society of Agricultural Engineers (ISAE) and National Symposium on "Doubling Farmers' Income through Technological Interventions" at Anand Agricultural University, Anand (Gujrat) from January 8-10, 2018, Pp 103.
- Ashwani and V.K. Singh (2018) Performance evaluation Spice grinder. 52nd Annual Convention of Indian Society of Agricultural Engineers (ISAE) and National Symposium on "Doubling Farmers' Income through Technological Interventions" at Anand Agricultural University, Anand (Gujrat) from January 8-10, 2018, Pp 103

Practical Manual

- Sunil Kumar, Arun Kumar and M K Garg (2018). Practical manual on Post-Harvest Engineering of Cereals, Pulses and Oilseeds. Publication no. CCSHAU/PUB#18-0020.

Training Manual

- Yadvika, M.K. Garg, V.K. Singh, D.K. Sharma and Kanika Pawar (2017): Operation and Maintenance of Renewable Energy Appliances (in Hindi). Department of Processing & Food Engineering, COAE&T, CCSHAU, Hisar Pages 51.

Leaflets

- Yadvika, M.K. Garg, V.K. Singh, D.K. Sharma, Kanika Pawar, Raveena (2017). Kenchua Prithakaran Sanyantra (Earthworm separator). Department of Processing & Food Engineering, COAE&T, CCSHAU, Hisar.

Lectures Delivered

- Dr. M.K. Garg delivered lecture on Different types of Packaging to the participants of Training Course on Post Harvest Techniques of Fruits and Vegetables organized by Department of Horticulture in collaboration with Students' Counseling and Placement Centre, DSW on CCS HAU, Hisar.
- Dr. M.K. Garg invited to deliver lecture on 'Hermetic Storage Technique of Food Grains' during 15 days training program on 'Modern Storage Technologies in Agriculture' funded by USAID & GoI under Feed the future India Triangular training in collaboration with MANAGE, Hyderabad at CIPHET, Ludhiana on 11.09.2017 and 11.06.2018.

New equipments procured

Sr. No.	Name of Equipement	Quantity	Amount (Rs)	Name of Scheme
1	Hand operated maize sheller	1	16,475	1140/C(a) Dte-R-1-Agri (A)
2	Ohmic heater	1	24,000	1140/C(a) Dte-R-1-Agri(A)
3	Math work Suite	1	14,33,332	1093-T8-Agri State A
4	Illuminated Work Board	1	8,190	1093-T8-Agri State A
5	Grain Vernier	1	18,690	1093-T8-Agri State A
6	Arduino Kit	1	49,914	1093-T8-Agri State A
		Total	15,50,601	

Infrastructure developed/ strengthened

- Glazing of the solar tunnel dryer in the energy park for drying of fruits and vegetables.
- Ventilators in the Agro Processing Centre for enhancement of comfort of working staff.

Award/Honours -

Patent filed

- Pedal operated machine for pricking fruits and vegetables (Submitted, Under process)

New Initiatives taken during the Period

- New projects to outside agencies were submitted. Labs were strengthened by purchasing new equipments.
- New experiments have also been planned under State and ICAR schemes.

International/National Conferences, Seminars, Training/ Refresher Course/Winter/Summer Schools Attended by Faculty Members

- Dr. M. K. Garg and Dr. D.K.Sharma attended 52nd Annual Convention of Indian Society of Agricultural Engineers (ISAE) and National Symposium on "Agricultural Engineering for Sustainable and Climate Smart Agriculture" at Anand Agricultural University, Anand from January 8-10, 2018.
- Er. Sunil Kumar participated and present the poster on Experiential Learning Program of college in two days (1 and 2 June, 2018) National Startup Summit (NSUS-2018) in the CCS HAU, Hisar (Govt.).
- Er. Sunil Kumar participated in five Days Training Programme in Accounts for Teachers and Technical Employees for Departmental Examination from May, 1-5, 2018 in Directorate of Human Resource management, CCS HAU Hisar (Govt.).
- Er. Sunil Kumar participated in two Days Overview Training Programme of MatLab Software from May, 8-9, 2018 in Deans Committee Room of COAE&T, CCS HAU Hisar (Govt.).
- Er. Sunil Kumar participated in one Day Training Programme (April 5, 2018) regarding Anti-plagiarism Software in Auditorium of COBS&H, CCS HAU Hisar(Govt.).
- Er. Sunil Kumar attended 21 days training (4th to 24th January, 2018) on "Advanced Storage and Packaging Technologies for Durable and Perishable Foods" at ICAR-Central Institute of Agricultural Engineering, Bhopal (MP)(Govt.).
- Er. Sunil Kumar participated in five days (25th June to 29th June, 2018) training on "Post-harvest Management and Storage Techniques" at National Institute of Plant Health management, Rajendranagar, Hyderabad, Telangana(Govt.).
- Dr. V.K. Singh attended 21 days CAFT training programme on "Design and manufacturing of Agro processing machines" from 1- 21 August, 2017 at the ICAR-Central Institute of Agricultural Engineering NabiBagh, Berasia Road Bhopal - 462 038 (M.P.), India.

Extension works including trainings organized

- Demonstration of Agro-Processing machineries for one day (16/02/2018) KrishiMela organized in the Kalwasvillage of Hisar district.
- KisanMela for two days Mela from March 27-28, 2018 in university Mela ground at CCS HAU Hisar.
- KisanMelafor two days from September 18-19, 2017 in University Mela ground at CCS HAU Hisar.
- Celebration of "Agriculture Education Day" on 3rd December, 2017 organized at CCS HAU Hisar.
- Entrepreneurship development one day training of farmers on potato chips making at Fruit and Vegetable Processing laboratory in department of Processing and Food Engineering on 30/05/2018

Assignments and duties performed by the faculty members

Dr. M. K. Garg

- Officer on Special Duty to Vice-Chancellor, CCS HAU, Hisar
- Coordinator, Project Monitoring Cell, CCS HAU, Hisar
- Chairperson of Investment Committee, CCS HAU, Hisar
- Chairman, Grievance Committee, COAE&T, CCS HAU, Hisar
- Member of Project Monitoring & Review Committee of Agri business incubation centre, CCSHAU, Hisar

- Member of Quinquennial Review Team (QRT) to review the work done by the Central Institute of Agricultural Engineering, Bhopal including its AICRPs (EAAI, UAE, FIM, ESA) and CRPs (FM&PF, EA) for the period of 2012-17.
- Member of National Board of Accreditation (NBA) team to evaluate engineering programmes at College of Technology & Engineering, Udaipur from 15th to 17th September, 2017.
- Member, Agricultural & Food Processing Sectional Committee, FAD 20, Bureau of Indian Standards, New Delhi
- Member of Academic Council, CCS HAU, Hisar
- Chairperson of Technical Session on Diversified Agriculture and Value Addition during the Golden Jubilee International Conference on Gender Issues and Socio-Economic Perspectives for Sustainable Rural Development held at CCS HAU, Hisar from October 23-25, 2017.
- Member, Board of Studies, College of Agricultural Engineering & Technology
- Member, Board of Studies, Center of Food Science & Technology
- Member for the preparation of draft guidelines for purchase of material through GeM.
- Member (as DG, ICAR nominee) of assessment committee for assessment of Scientists under CAS in the discipline of AS&PE at CIPHET Ludhiana on 11.09.2017 and 11.06.2018.
- Member of selection committee for selection to the post of Additional Director of Research at PAU, Ludhiana o 13.01.2018.
- Member of selection committee for selection to the post of Assistant Professor (PFE), DES (Agril. Engg.), Workshop Engineer and Plant Engineer at CCSHAU, Hisar
- Adviser to interview candidates for the post of Principal Scientist (Agricultural Process Engineering) conducted by ASRB, Pusa on 10.10.2017.
- The technical papers of JFST-D-17-00187, Journal of Food Science & Technology (NAAS rating – 7.26)
- Evaluated and viva-voce of M.Tech. student of PAU, Ludhiana conducted on 11th Sept., 2017.
- Evaluated Industrial Training Reports & conducted viva-voce exam of M.Sc. (Food Tech.) students of GJU, Hisar
- Evaluated and conducted viva-voce exam of in-plant training reports of CDLU, Sirsa on 18.04.2018.

Dr. D.K.Sharma

- NSS Coordinator in College of Agricultural engineering and Technology.
- Invigilator Duty for entrance Test (I)-2018 on June 9, 2018.
- Store Incharge, Department of Processing and Food Engineering.
- Member expert, National Horticultural Mission project in Haryana.

Dr. Ravi Gupta

- Attended a programme by Agri Innovate Ltd., a company of ICAR, programme on 6.6.2018 on behalf of University administration.
- Coordinator (Research Projects), COAE&T , nominated by DR
- I/C APC and Pilot Plants of the Department
- FSSAI registration for APC which for the first time in the University
- Member College level committee on cleanliness under “Swach Bharat Mission “
- Responsibilities for Coordinator (Research Projects), I/C AICRP-PHET, Departmental purchase committee, I/c of APC and pilot plants of the Department.
- Collected and facilitated ABIC documentation work

- Facilitating RVSKVV-Gwalior in getting permission of MoU on Organic production with FiBL –Switzerland from DARE, Govt. of India
- BIS meeting of FAD 20 and visit to IIT Delhi for getting information from FITT
- Attended SCOPUS training at CoBS&H
- Dean's Nominee for PFE 410 , Hands on Training in Processing of Agricultural Produce (0+3)
- Nominated as Technical member for purchase and inspection of food processing equipments
- Attended National Startup Summit
- Attended workshop at NAAS complex on behalf of University

Dr. V.K. Singh

- Performed as Nodal Officer for COAE&T/Directorate, DHRM, of CCSHAU regarding accreditation of the CCSHAU, Hisar.
- Worked as a Sports Co-ordinator of COAE&T, CCS HAU, Hisar.
- Perform duty as Secretary of PFE departmental Advisory committee.
- Physically verified the stores of transportation office for the year 2018-19.
- Member of Departmental purchase committee for the Department of Soil & Water Engineering.
- Performed Invigilation duty in examination of B.Tech.(Agril. Engg.), M. Tech. of COAE&T, CCS HAU Hisar.
- Member in committee's of purchase quotations, inspections, condemnations for the different Department of COAE&T, CCSHAU, Hisar.
- Physical verified the stores of the Department of Processing and Food Engineering, COAE&T, CCSHAU, Hisar.
- Incharge, Fruits, Vegetables Processing Pilot Plant Lab and Teaching lab of PFE, COAE&T,CCSHAU, Hisar.

Er. Sunil Kumar

- Demonstration of Agro-Processing machineries for one day (16/02/2018) *KrishiMela* organized in the *Kalwas*village of Hisar district.
- KisanMela duty for two days Mela from March 27-28, 2018 in university Mela ground at CCS HAU Hisar.
- KisanMela duty for two days from September 18-19, 2017 in University Mela ground at CCS HAU Hisar.
- Celebration of "Agriculture Education Day" on 3rd December, 2017 organized at CCS HAU Hisar.
- Entrepreneurship development one day training of farmers on potato chips making at Fruit and Vegetable Processing laboratory in department of Processing and Food Engineering on 30/05/2018
- Purchasing of equipment and software for the strengthening of laboratories in the department of Processing and Food Engineering.
- Member of working committee in Experiential Learning Program (Centre of Agro-Processing and Engineering Services) of college of Agricultural Engineering & Technology in university.
- Member of working committee in Experiential Learning Program of Centre of Food Science & Technology in university.
- Member of working committee in Central laboratory of college of Basic Science & Humanities with effect from May 28, 2018.
- Purchase of SC/ST training material for the KVKs and other department of university (27/12/2017).
- Incharge of two labs i.e. Quality Analysis Lab and Storage and Packaging Lab, of the department with effect from April 7, 2018.
- Nominated as faculty working on Artificial Intelligence in agriculture with effect from April 4, 2018.

- Member of department purchase committee of the Farm Machinery and Power Engineering
- Member of departmental Advisory committee of Processing and Food Engineering with effect from March 12, 2018.
- Participated and present the poster on Experiential Learning Program of college in two days (1 and 2 June, 2018) National Startup Summit (NSUS-2018) in the CCS HAU, Hisar (Govt.).
- Participated in five Days Training Programme in Accounts for Teachers and Technical Employees for Departmental Examination from May, 1-5, 2018 in Directorate of Human Resource management, CCS HAU Hisar (Govt.).
- Participated in two Days Overview Training Programme of MatLab Software from May, 8-9, 2018 in Deans Committee Room of COAE&T, CCS HAU Hisar (Govt.).
- Participated in one Day Training Programme (April 5, 2018) regarding Anti-plagiarism Software in Auditorium of COBS&H, CCS HAU Hisar (Govt.).
- 21 days training (4th to 24th January, 2018) on "Advanced Storage and Packaging Technologies for Durable and Perishable Foods" at ICAR-Central Institute of Agricultural Engineering, Bhopal (MP) (Govt.).
- Participated in five days (25th June to 29th June, 2018) training on "Post-harvest Management and Storage Techniques" at National Institute of Plant Health management, Rajendranagar, Hyderabad, Telangana (Govt.).
- Member of registration committee in three days' workshop on Natural and Spiritual Farming in university (28-30 November, 2018).
- Coordinator in two Days Overview Training Programme of MatLab Software from May, 8-9, 2018 in Deans Committee Room of COAE&T, CCS HAU Hisar
- Assigned duty for regular update of college website for all departments of COAE&T with effect from January 2, 2018.
- Member of refreshment committee regarding celebration of Engineer's Day in COAE&T of university (September 15, 2018).
- Inspection of cold stores for fruits and vegetables constructed under the mission of Horticulture in Haryana (19/02/2018).
- Incharge of video conference Hall in COAE&T with effect from June 6, 2018.
- Invigilator Duty for entrance Test (I)-2018 on June 9, 2018.
- Physical Verification of stores in Department of Processing and Food Engineering.
- Member in the committee of 25th convocation of university for preparation of report of the Honorable Vice Chancellor.

Er. Arun Kumar Attkan

- Conducted 3 days inspection duty for HSHDA projects (cold storage and ripening chambers) as a university representative from January 16, 2018 to January 18, 2018.
- Assigned duty for college librarian with effect from August 21, 2017.
- Member of financial committee regarding celebration of Engineer's Day in COAE&T of university (September 15, 2018).
- Appointed as Hostel Warden of Varindavan Hostel in the duration of October 10, 2017 to January 24, 2018.
- Member of registration committee in three days workshop on "Natural and Spiritual Farming" in university (28-30 November, 2018).

List of thesis submitted by M.Tech. Students (as on 30.06.2018)

Sr. No	Name	Admission No	Title	Name of Advisor
1	Rajeev Gupta	96AE86M	Mathematical modeling for environment conditions in an evaporative cooling chamber	Dr. M. K. Garg
2	Ravi Gupta	97AE116M	Study of milling factors on basmati paddy (Taraon Basmati & Basmati 370) for head rice recovery	Er. M.C. Kashyap
3	Sandeep Mann	97AE117M	Design and development of knowledge base seed storage information system	Dr. M. K.Garg
4	Pawan Veer	98AE124M	Development and testing of straw densification machine	Er. Surjeet Jain
5	Pratima Bajaj	98AE125M	Investigation of mass transfer during osmotic dehydration of button mushrooms (Agaricusbisporus)	Er. Surjeet Jain
6	Ramachandra, C.T.	2000AE135M	Equilibrium moisture content and drying characteristics of selected medicinal plants	Er. Surjeet Jain
7	Preeti Panda	2000AE137M	Osmo-air drying of grapes for raisin preparation	Dr. M.K.Garg
8	Anil Kumar	2000AE136M	Development of an integrated energy system for a goshala complex	Er. Surjeet Jain
9	Manjunatha	2001AE229M	Osmo-convective dehydration of cauliflower	Er. J. M. Wadhwa
10	Ritu Raj Mehta	2002AE110M	Comparative evaluation of different drying methods to dry liquorice (mulhatti)	Er. Surjeet Jain
11	Vijay Kumar Singh	2002AE111M	Effect of packaging materials on the shelf life of moisture sensitive foods	Dr. M. K.Garg
12	Balwan Singh	2002AE108M	Comparative evaluation of different drying methods for drying of kasuri fenugreek leaves	Er. M.C. Kashyap
13	Raj Kumar	2003AE208M	Drying behaviors of rapeseed (toria) under thin layer conditions	Er. Surjeet Jain
14	SujataNayak	2003AE210M	Simulation and optimization of a solar dryer	Dr. M. K.Garg

15	SipnaDeshmukh	2005AE114M	Effect of edible coatings & packaging method on shelf life of button mushroom (Agaricusbisporus)	Er. Surjeet Jain
16	Md. MahfoozAalam	2006AE137M	Development and testing of packages for transportation of guava	Dr. M.K.Garg
17	Indu	2006AE136M	Optimization of process parameters of soymilk and Tofu production unit	Er. Surjeet Jain
18	Kailash Bhatt	2007AE80M	Development of a steam blancher for vegetabes	Dr. M.K.Garg
19	Yogita	2007AE82M	Method of extraction of anthocyanin pigments from red rose	Er. Surjeet Jain
20	Yogender Singh	2008AE96M	Comparative performance of evaporative cool chambers using alternative materials for storage of fruits and vegetables	Dr. Y. K. Yadav
21	Rajeshwari Patti	2008AE97M	Effect of moisture content on physical properties of coarse grains	Er. Surjeet Jain
22	Chavan Sandeep Pandhari	2009AE208M	Development of a dehumidified air dryer	Dr. M. K.Garg
23	Abhishek Shukla	2009AE209M	Development of paddle operated petha (ashgourd) pricking machine.	Dr. D. K. Sharma
24	Sunil	2009AE210M	Optimization of biogas slurry use for digestion of an admixture of kitchen waste & cattle dung	Dr. Y. K. Yadav
25	Aarjoo	2010AE170M	Performance evaluation of solar tunnel dryer for round the year use	Dr. Yadvika
26	Nitesh	2010AE172M	Development of solar regenerated desiccant dryer	Dr. Y.K. Yadav
27	Patil Rushikesh Ashok	2010AE173M	Mass transfer kinetics of aloe vera during osmo-convective dehydration	Dr. M.K. Garg
28	Anarase Dattatray Arjun	2011AE124M	Development of decision support tool for design of commercial grain storage	Dr. M.K. Garg
29	Arun Kumar	2011AE125M	Development of a desiccant based food drying system	Dr. Y.K. Yadav

30	Sunil Kumar	2012AE04M	Comparative evaluation of quality changes in stored wheat in hermetic silo bags and conventional methods	Dr. M.K. Garg
31	Nitin Kumar	2012AE01M	Design, development and performance evaluation of foot operated aonla pricking machine	Dr. D.K. Sharma
32.	Sushant Bhardwaj	2013AE02M)	Techno-economic feasibility studies of a solar regenerated desiccant integrated seed drying system	Dr. Yadvika
33.	Vinay	2014AE04M	Design and development of pedal operated maize sheller	Dr. V. K. Singh
34.	Sandeep	2014AE03M	Spent mushroom substrate utilization using different portable technologies	Dr. Yadvika
35.	Raveena	2015AE02M	Energy use pattern of pearl millet production and processing	Dr. Yadvika
36.	Ashwini SC	2016AE01M	Effect of ohmic heating on oil recovery from rice bran	Dr. M.K. Garg
37.	Sachin	2016AE02M	Effect of microwave heating on extraction of essential oil from turmeric (Curcuma longa L.)	Dr. V. K. Singh
38.	Annu	2016AE04M	Techno-economic Evaluation of Solar Biomass Shredder	Dr. Yadvika

Address and Telephone number of staff members

S.No.	Name (Dr/Mr./Mrs.)	Address	Date of birth	Telephone	E-mail
1	M.K.Garg	8/15, New Campus, HAU	17.09.60	9416674060	mkgarg.hau@gmail.com
2	D.K.Sharma	10/110, Farm Colony, HAU	04.11.64	9416846103	dksharma.hau@gmail.com
3	Ravi Gupta	10/2, Old Campus, HAU, Hisar	23.08.74	7501112404	ravigupta2300@yahoo.com
4	V.K.Singh	10/107, New Campus, HAU	20.10.77	9992661719	vijurss@gmail.com
5	Sunil Kumar	304, Defense Colony, Hisar	30.10.90	9990177757	sksaroha@hau.ernet.in
6	Arun Kumar Attkan	Gali No. 7, Jawahar Nagar, Hisar	16.11.88	9416713102	arun.pfe@hau.ernet.in
7	Nitin Kumar	36, Berwal Sadan, Krishna Nagar, Hisar	30.12.89	9466263889	nitin@hau.ernet.in
8	Shri Gopal	Luxmi Vihar Colony	01.04.61	9812454946	
9	Savita*	B-11, WWH, HAU	02.06.74	9996259026	
10	Mahadev	VPO Dhigtana	03.02.64	9466611905	
11	Gopi Ram	178, Inqlab Friends Colony, Azad Nagar	20.03.68	7027275656	
12	Ravi Kant	H.No. 12, Block C, New Model Town	20.02.85	9728753232	
13	Naveen	VH 14/4, Old Campus, HAU, Hisar	07.10.85	9466489026	

*Transferred to CFST 22.09.2018 after her promotion.

List of retired faculty members

S. No.	Name (Dr./Er.)	Present address	Date of retirement	Telephone number
1	M.C. Kashyap	HIG-292, Sector 71, Mohali	30.06.06	9855600684
2	Rati Ram Gupta	13, Geeta Colony, Salarpur Road, Kurukshetra	30.06.07	9315867908
3	Surjeet Jain	4, PLA, Hisar	30.09.10	9416397556
4	J.M.Wadhwa	Rohtak	31.10.15	9416147699

Roster of Head of Department

S. No.	Name	Date	
		From	To
1	Dr. D.P. Kataria*	March, 1996	25.02.1998
2	Dr. R.R. Gupta	26.02.1998	26.02.1999
3	Dr. D.P. Kataria*	27.02.1999	04.05.1999
4	Er. Surjeet Jain	05.05.1999	04.05.2002
5	Prof. J.M. Wadhwa	05.05.2002	28.05.2004
6	Dr. Pratap Singh*	29.05.2004	30.10.2007
7	Dr. Y.K. Yadav	31.10.2007	30.10.2011
8	Dr. M.K. Garg*	31.10.2011	22.10.2012
9	Dr. SarojJeet Singh*	23.10.2012	31.12.2012
10	Dr. A.K. Goel*	01.01.2013	31.05.2013
11	Dr. M.K. Garg	01.06.2013	Continuing

*Additional charge as Dean, COAE&T

College of Agricultural Engineering and Technology at a Glance

Haryana Agricultural University Established	: 2nd February, 1970
Department of Agricultural Engg. Established	: 2nd February, 1970
B. Tech. (Agril. Engg.) Programme Started	: August, 1987
College of Agril. Engg. and Technology Established	: March, 1992
College of Agril. Engg. and Technology Inaugurated	: August, 1992
M. Tech. (Agril. Engg.) Programme with Specializations in FPM and SWE Started	: August, 1993
Department of Farm Power & Machinery and Department of Soil & Water Engineering Established	: September, 1993
Department of Agril. Processing and Energy Established	: March, 1996
M. Tech. (Agril. Engg.) Programme with Specialization in Agril. Processing and Food Engineering Started	: August, 1996
Section of Basic Engineering Established	: October, 1996
Departments Renamed As - Farm Machinery & Power Engineering - Processing & Food Engineering	: September, 2010
Department of Renewable and Bio-Energy Engineering and Department of Basic Engineering Established	: March, 2017

Teaching Load of the Department

Course No.	Course Title	Credit Hours	Contact Hours
Semester -I			
PFE 201	Engineering Properties of Biological Materials and Food Quality	2+1	4
PFE 301	Dairy and Food Engineering	2+1	4
PFE 304	Protected Cultivation and Post-harvest Technology (For B.Sc. (Hons.) Agriculture)	1+1 (3 Section)	15
PFE 390	Summer Training – I	0+3	1
PFE 401	Food Processing Plant Design and Layout	2+1	4
PFE 490	Summer Training – II	0+3	1
PFE 402	Design and Maintenance of Green House	2+1	4
PFE 403	Food Packaging Technology	2+1	4
PFE 411	Project on Processing and Food Engineering - I	0+3 (18 students)	18
PFE 502	Engineering Properties of Biological Materials	2+1	4
PFE 504	Farm Structures and Environmental Control	2+1	4
PFE 506	Processing of Cereals, Pulses and Oilseeds	2+1	4
PFE 510	Food Packaging	2+1	4
PFE 511	Food Quality and Safety Engineering	2+1	4
PFE 591	Master's Seminar	1	1
PFE 592	Special Problem	0+1	2
PFE 595	Industry/ Institute Training	0+1 (NC)	1
PFE 599	Master's Research	Master's research (6 students)	6
PFE 601*	Textural and Rheological Characteristics of Food Materials	2+1	4
PFE 603	Mathematical Models in Food Processing	3+0	3
PFE 609	Special Problem in Processing & Food Engg.	0+1	2
PFE 691	Doctoral Seminar – I	1+0	1
PFE 699	Doctoral Research	Doctoral Research (3 students)	3
Total			**98**
Semester II			
PFE 202	Crop Process Engineering	2+1	4
PFE 203	Renewable Energy Sources	2+1	4
PFE 302	Agricultural Structures and Environmental Control	2+1	4
PFE 303	Drying and Storage Engineering	2+1	4
PFE 305	Renewable Energy (For B.Sc. (Hons.) Agriculture)	1+1 (3 sections)	15
PFE 391	Undergraduate Seminar	0+1	2

PFE 410	Hands on Training in Processing of Agricultural Produce	0+3	6
PFE 412	Project on Processing and Food Engineering - II	0+3 (18 students)	18
PFE 501	Transport Phenomena in Food Processing	2+1	4
PFE 503	Advanced Food Process Engineering	2+1	4
PFE 505	Advanced Food Process Engineering	2+1	4
PFE 507	Food Processing Equipment and Plant Design	2+1	4
PFE 508	Fruits and Vegetables Process Engineering	2+1	4
PFE 509	Meat Processing	2+1	4
PFE 512	Biochemical and Process Engineering	2+1	4
PFE 513	Storage Engineering and Handling of Agricultural Products	2+1	4
PFE 514	Seed Drying, Processing And Storage	2+1	4
PFE 591	Master's Seminar	1	1
PFE 592	Special Problem	0+1	2
PFE 592	Industry/ Institute Training	0+1 (NC)	1
PFE 599	Master's Research	Master's research (6 students)	6
PFE 602*	Advances in Food Processing	3+0	3
PFE 604	Advances in Drying of Food Materials	2+1	4
PFE 605	Agricultural Waste and By-Products Utilization	2+1	4
PFE 609	Special Problem in Processing & Food Engg.	0+1	2
PFE 692	Doctoral Seminar – II	1+0	1
PFE 699	Doctoral Research	Doctoral Research (3 students)	3
Total			**120**

Teaching load during semester –I = 98 contact hours per week
Teaching load during Semester – II = 120 contact hours per week
Total Teaching Load = 98+ 120 = 218 contact hours

Average Teaching load per semester = 218/2 = 109 contact hours

List of laboratories and their lab Incharge

Sr. No.	Name of Laboratory	Name of Incharge	Supporting Staff
1	Agricultural Processing Engineering Lab	Dr. Arun Kumar Attkan	Smt. Savita
2	Fruits and Vegetables Processing Lab	Dr. V.K. Singh	Sh. Mahadev
3	Quality Analysis Lab	Er. Sunil Kumar	Sh. Shrigopal
4	Storage and Packaging Lab	Er. Sunil Kumar	Sh. Shrigopal
5	Pilot Plant	Dr. Ravi Gupta	Sh. Gopi
6	Engineering Workshop	Dr. Ravi Gupta	Sh. Gopi
7	Agro Processing Centre	Dr. Ravi Gupta	Sh. Gopi/ Sh. Mahadev

Department Advisory Committee (Upto 30.06.19)

Chairperson : Dr. M.K. Garg, HOD

Secretary : Dr. V.K. Singh

Members : Dr. D.K. Sharma, Er. Arun Kumar, Er. Sunil Kumar