VIGNAN'S
(Deemed to be University)

Agricultural Engineering Department

Minutes of Meeting

20.02.2025

The meeting of DAAC committee was conducted on, 20.02.2025 at 10.05 a.m. at department Library under the chairmanship of Dr. Hadole Mahesh, Department Coordinator.

The following points were discussed in the meeting:

1) R25 Regulation: Dr. T. Prabhakar Rao presented R25 regulations
2) Preparation of Course curriculum considering R25 regulation and Sixth Deans Committee Guidelines.
3) All members have agreed to follow R25 regulation and Sixth Deans Committee and revision in the curriculum accordingly as a R25-C25.
4) It was decided to conduct BoS meeting in the month of March, 2025 according to the availability of members and propose R25-C25 for approval.
5) Dr. T. Prabhakar Rao, BoA has been given responsibility to monitor all curriculum revision activity.

The meeting was concluded as there is no further point to discuss members.

20.2.25

Coordinator
Agricultural Engineering

Dr. Hadole Mahesh Vinayak
Assistant Professor & Coordinator
Department of Agricultural Engineering
VFSTR (Deemed to be University)
Vadlamudi, Guntur, A.P.-522 213.

Annexure – IV

VIGNAN'S
(Deemed to be University)

DEPARTMENT OF AGRICULTURAL ENGINEERING

CIRCULAR

Date: 24.02.2025

Department of Agricultural Engineering is going to conduct 7th Board of Studies (BoS) meeting for the B. Tech. Agricultural Engineering and M. Tech (Farm Machinery) Programme on **08.03.2025** from 09.30 AM to 02:00 PM. The meeting will be held in blended mode, physically at AGF06, U-Block, Vignan University, and virtually *via* MS Team. All the members are requested to make it convenient to attend the meeting.

The members are

Sl. No	Name of the member	Designation and Address	Role
1	Dr. Hadole Mahesh Vinayak	Coordinator & Assistant Professor, Agricultural Engineering Dept. Mob: +91-9765268662, Mail: hmv_ae@vignan.ac.in	Chair person
2	Prof. T. Ramesh Babu	Director, Department of Agriculture and Horticultural Sciences, and Dean School of Agriculture and Food Technology, VFSTR Mob: +01-048312629, mail: doar saft@vignan.ac.in	Internal member (Academia)
3	Dr. T V Satyanarayana	Former Dean of Agricultural Engineering and Registrar, ANGRAU; Presently Registrar, MNR Educational Institutions, Sangareddy, Hyderabad. Mob: +91-9440264684 mail: info@mnruniversity.com	Invited member (Academia) ~~ONLINE~~
4	Dr. K.P. Vidhu	Joint Director NIPHM, Hyderabad Mob: +91-8500719141 Mail: kp.vidhud@gov.in	External Member from Central Research Institution (Invited member)
5		Department of Agricultural and Food Engineering, IIT Kharagpur	External Member from

	Prof. P.S. Rao	Mob: +91-3222-263164 Mail: parao@jagte.tgp.ac.in	Academics
6	Mr. A.S. Subbarao	DGM-Agronomy, SBU-South NETAFIM, India Mob: +918142244704 mail: as.subbarao@netafim.com	Invited member (Industry) ~~ONLINE~~
7	Dr. P. L. N. Varma	Professor & Head, Department of Mathematics and Statistics, Mob: +91-9490606025, Mail: hod_maths@vignan.ac.in	Internal member (School nominee)
8	Dr. Ayyanna DS	Assistant Professor & BOR, AE Mob: +91-8105130846, Mail: drads_ac@vignan.ac.in	Internal member (Dean R&D nominee)
9	Dr. M.Anusha	Assistant Professor & BOE, AE Mob: +91-7725996057, Mail:drma_ac@vignan.ac.in	Internal member
10	Dr. T Prabhakara Rao,	Assistant Professor & BOA, AE Mob: +91- 79897 33870, Mail: drtpr_ahs@vignan.ac.in	Member (Secretary)

Agenda of the BoS Meeting:

1. Approval for Curriculum (C24) as per R22 and Sixth Deans' Committee Recommendations.
2. Introduction of New Regulation 2025 (R25) and Approval of Curriculum (C25) of B. Tech. (Agricultural Engineering) Programme according to Regulation (R25) and Sixth Deans' Committee Recommendations.
3. Suggestions for M. Tech (Farm Machinery) Curriculum (C25) Revision for R25.
4. Any other points with the permission of Chairperson.

24/2/25

Member Secretary

24/2/25

Chairperson

4

Annexure – V

VIGNAN'S
(Deemed to be University)

DEPARTMENT OF AGRICULTURAL ENGINEERING

Date: 08.03.2025

Minutes of Board of Studies Meeting

Board of Studies (BoS) meeting of B. Tech., Agricultural Engineering programme and M. Tech (Farm Machinery) was held on March-8, 2025, from 9:30 AM. to 2:00 PM. The meeting was conducted in a blended format: some participants attended in person at the AGF06, U-Block, Vignan University, and virtually *via* MS Team. The event was presided over by Dr. Hadole Mahesh Vinayak, Department Coordinator and Chairperson of the Board of Studies. Department of Agricultural Engineering, School of Agriculture and Food Technology, VFSTR.

Agenda of the BoS Meeting:

1. Approval for Curriculum (C24) as per R22 and Sixth Deans' Committee Recommendations.
2. Introduction of New Regulation 2025 (R25) and Approval of Curriculum (C25) of B. Tech. (Agricultural Engineering) Programme according to Regulation (R25) and Sixth Deans' Committee Recommendations.
3. Suggestions for M. Tech (Farm Machinery) Curriculum (C25) Revision for R25
4. Any other points with the permission of Chairperson

The following members were present either thorough offline or online (Annexure-I also).

Sl. No	Name of the member	Designation and Address	Role	Signature
1	Dr. Hadole Mahesh Vinayak	Coordinator & Assistant Professor, Agricultural Engineering Dept. Mob: +91-9765268662, Mail: hodae@vignan.ac.in	Chair person	Hadole 8/3/25
2	Prof. T. Ramesh Babu	Director, Department of Agriculture and Horticultural Sciences, and Dean School of Agriculture and Food Technology, VFSTR Mob: +01-048312629, mail: dean_saft@vignan.ac.in	Internal member (Academia)	
3	Dr. T. V. Satyanarayana	Former Dean of Agricultural Engineering and Registrar, ANGRAU; Presently Registrar,	Invited member (Academia) ~~ONLINE~~	online

		MNR Educational Institutions, Sangareddy, Hyderabad. Mob: +91-9440264684 mail: info@mnruniversity.com		
4	Dr. K.P. Vidhu,	Joint Director NIPHM, Hyderabad Mob: +91-8500719141 Mail: kp.vidhud@gov.in	External Member from Central Research Institution	
5	Prof. P.S. Rao,	Department of Agricultural and Food Engineering, IIT Kharagpur Mob: +91-3222-263164 Mail: parao@jagte.tgp.ac.in	External Member from Academics	
6	Mr. A.S. Subbarao	DGM-Agronomy, SBU-South NETAFIM, India Mob: +918142244704 mail: as.subbarao@netafim.com	Invited member (Industry) ~~ONLINE~~	online
7	Dr. P. L. N. Varma	Professor & Head, Department of Mathematics and Statistics, Mob: +91-9490606025, Mail: hod_maths@vignan.ac.in	Internal member (School nominee)	
8	Dr. Ayyanna DS	Assistant Professor & BOR, AE Mob: +91-8105130846, Mail: drads_ae@vignan.ac.in	Internal member (Dean R&D nominee)	
9	Dr. M. Anusha,	Assistant Professor & BOE, AE Mob: +91-7725996057, Mail:drma_ae@vignan.ac.in	Internal member	
10	Dr. T Prabhakara Rao.	Assistant Professor & BOA, AE Mob: +91- 79897 33870, Mail: drtpr_ahs@vignan.ac.in	Member (Secretary)	8/3/25

Dr. T. Prabhakar Rao, a member of the Board of Academics (BoA), extended a warm welcome to both external and internal Board of Studies (BoS) members from the Department of Agricultural Engineering, as well as to special invitees who were distinguished experts from the industry and academia. Dr. Hadole Mahesh, as Chairperson, welcomed all attendees and special invitees, expressing sincere appreciation for their commendable efforts in ensuring a robust turnout. He highlighted the significant value of their collective presence in contributing to the success of the meeting.

Dr. Hadole then provided an overview of the meeting's agenda and initiated the presentation. The following points were discussed in the BoS meeting:

Agenda 1: Approval for Curriculum (C24) as per R22 and Sixth Deans' Committee Recommendations.

Dr. Hadole began by revising the key features and entry and exit options for the B. Tech. Agricultural Engineering programme, as per the ICAR's 6th Deans' Committee report, with a particular emphasis on credit distribution. The salient components include the Deeksharambh Foundation Course (2 weeks, non-gradial), core courses (major, minor, and elective credits), Multi-Disciplinary Courses (10 credits), Value

presented the updates in Renewable/Electrical and Electronics Engineering subjects. Dr. Saurabh covered the Computer Science and Engineering-related subjects. Dr. T Prabhakar and Mr. Amitabh Soni presented the modifications in Farm Machinery and Power Engineering (FMP) subjects. Finally, Mr. G. Aditya discussed the syllabus changes for Processing and Food Engineering (PFE) subjects.

All members actively observed the changes and provided their inputs respective to their areas of specialization. The semester wise course structure is attached in **Annexure-1.**

Discussion:

All the members have discussed and accepted the New regulation R25 and for making the change in the semester wise (I to VIII) course structure considering both R25 and 6th Deans' Committee report. Dr. Satyanarayan sir suggested to follow ICAR and maintain evaluation pattern (50:50) and passing criteria (50 %) as per ICAR and maximum 25 credit load to each semester. He also suggested to shuffle few subjects (eg. Watershed hydrology and SWCE) within a year if required.

The following are the specific comments made by members:

Dr. T. V. Satya Narayana suggested incorporating experiments on all three types of notches/weirs into the practical section of the Fluid Mechanics and Open Channel course. For the Soil and Water Conservation Engineering course, he proposed adding an extra credit if it does not exceed the maximum limit. He also recommended detailing all physical characteristics/parameters of watersheds, such as form factor and shape factor. in the Watershed Hydrology subject, and changing the heading of Module 2 Unit 2 to "Watershed Characterization, Prioritization and Modelling." In the Irrigation and Drainage Engineering course, he advised retaining practices like land grading methods, drainage coefficient estimation, and the Glover-Dumm Equation for designing subsurface drainage systems. Additionally, he suggested adding a design component for border irrigation (emphasizing Israelsons equation), check basin, and furrow irrigation, and conducting actual experiments on these topics. He also proposed adding extra practice in Module 1 of Engineering Mechanics, such as determining the centroid of irregular areas like watersheds, and ensuring all syntax and grammatical errors are corrected.

Mr. A. Subbarao recommended adding practice sessions on IoT-based irrigation scheduling, land grading, and precision irrigation, including automated smart irrigation systems, in the Irrigation Engineering and Sprinkler and Micro Irrigation Engineering subjects. He also suggested site visits to modern hi-tech polyhouse to demonstrate advanced IoT-based irrigation systems. Furthermore, he proposed considering the design of ripening chambers in the Agricultural Structures and Environmental Control

Added Courses (6 credits), Ability Enhancement Courses (10 credits), Skill Enhancement Course (SEC) (8 credits), the Internship/ Project/Student READY program (15 credits), Remedial Courses in Mathematics (1 credit), Non-gradial a 2-week study tour (2 credits), and 6 credits of online courses. Concise details of elective and skill enhancement courses were also presented. Dr. Hadole mentioned that as per 6th Dean committee C24 has been modified considering R22 and in last BoS meeting first year curriculum (C24) has been approved. In this meeting remaining second to final year curriculum (C24) will be presented along with C25. He also emphasized that structurally C24 and C25 are same, because both follow 6th Deans' Committee report. However, there is little change in Regulation only.

Further discussion covered the uniform examination and evaluation system with a standardized grading process, followed by an overview of semester-wise course for all four years and credit allocation and department-wise credit distribution.

Discussion:

All the members have accepted the curriculum (C24) as per R22 and for making the change in the semester wise (I to VIII) course structure considering both R22 and 6th Deans' Committee report.

Resolutions: Curriculum (C24) for all 4 years is approved by all the members.

Agenda 2: Introduction of New Regulation 2025 (R25) and Approval of Curriculum (C25) of B. Tech. (Agricultural Engineering) Programme according to Regulation (R25) and Sixth Deans' Committee Recommendations.

Dr. Hadole delivered a detailed presentation on the New Regulation 2025 (R25), emphasizing the division of the syllabus into two modules, first module with 2 units and second module with 3 units, and discussing their duration and assessment patterns. He also presented the credit distribution as per R25 and shown comparison with the 6th Deans' Committee recommendations. Dr. Hadole also highlighted the structures, teaching methodologies, and evaluation methods of the R22 programme, comparing them with those of the R25 programme.

Dr. Hadole began the presentation by discussing the curriculum revisions (C24 and C25 both) for Soil and Water Conservation Engineering (SWCE) and Irrigation and Drainage Engineering (IDE) subjects. This was followed by Mr. Amitabh Soni, Mr. Ravikant, Mr. Anirudh, Dr. Gopal Rao, and Dr. Kartikeyan, who presented subjects from Agricultural Structures and Civil and Environmental Engineering (ASCEE). Dr. Rajanand and Dr. Swarnlata then presented modifications in Basic Agriculture and Basic Sciences subjects. Dr. Pradeep, Dr. Farookh, and Dr. Durgarao discussed the changes in Mechanical Engineering-related subjects. Dr. M Anusha and Mrs. Ramya

course and including interactions with farmers regarding the socio-economic aspects of farming-based livelihood systems.

Prof. P.S. Rao suggested to specifically mention evaluating static or dynamic friction problems in the practice sessions of the Engineering Mechanics course. In the Theory of Structures course, he advised using grain interaction with steel or RCC structures, such as silos, as examples. He also recommended visits to local storage structures for the Agricultural Structures and Environmental Control course. He suggested to include Algae Biomass topic in M2 practices of Bio-energy Systems - Design and Applications course. He commented that add UV Spectroscopy uses for food in practice session in Engineering Chemistry. For Food Processing Engineering-related subjects, he emphasized arranging topics from simple to complex and aligning practices accordingly. Further, he suggested to separate Thermal Processing and Non-Thermal Processing title in theory and discuss all types of mixer separately in practice section of Food and Dairy Engineering. He stressed the importance of preparing lab manuals for newly added subjects and correlating all basic engineering subjects' topics with agriculture. Additionally, he suggested discussing the syllabus with a food safety officer or industrial person and inviting them to teach those topics or share the facilities.

Dr. K. P. Vidhu recommended specifically mentioning commonly used statistical software/packages in the Agricultural Statistics and Data Analytics course practices. Regarding the Basics of Electronic Gadgets and Instruments subject, he emphasized including agricultural-based measuring instruments in the syllabus. For the Agricultural Informatics and Artificial Intelligence course, he noted that the syllabus is extensive and could be considered a basic course. However, he suggested making it as practical as possible so that students can understand the agricultural applications of smartphones, sensors, robots, and drones. Farm Machinery and Equipment – I &II subject, he advised to specifically mention each unit titles and suggested that plant protection equipment and their codes are not feasible for practical sessions and should be discussed separately in theory.

Resolutions: As per the stakeholders' feedback, there is more than 25 % change in the syllabus. Therefore, Curriculum (C25) of B. Tech (Agril. Engg.) as per R25 and 6th Deans' Committee report is approved by all the Members.

Agenda 3: Suggestions for M. Tech (Farm Machinery) Curriculum (C25) Revision for R25

Dr. Anusha announced that the M. Tech (Farm Machinery) curriculum, approved during previous Board of Studies (BoS) meetings, is to be revised for R25 Regulation. She also mentioned that students have the option to select advanced NPTEL and MOOCs courses for an Add-on degree. She invited suggestions for the same.

Discussion:

Dr. K. P. Vidhu suggested preparing a specific list of NPTEL or MOOCs courses that students can follow for the Add-on degree. Dr. Hadole agreed and stated that they would communicate this list along with the proposed syllabus for suggestions by all members. The proposed add-on courses list is attached in **Annexure-2**:

Resolutions: All members accepted revision for M. Tech (Farm Machinery) curriculum.

Agenda 4: Any other points with permission of chairperson

ICAR Accreditation

- **Dr. K. P. Vidhu** suggested pursuing ICAR accreditation, noting that the department has been operational since 2012-13. **Dr. P. S. Rao** supported this suggestion and emphasized the importance of preparing an action plan and a Self-Study Report. He also recommended leveraging the facilities and support from other departments and management to achieve ICAR accreditation. **Dr. Hadole** acknowledged their efforts and assured that they would soon present a plan to obtain ICAR accreditation.

The following resolutions made after the discussion:

1. BoS Members approved the revised regulations (R25), curriculum structure (C24 and C25), syllabus of B. Tech., Agricultural Engineering programmes and it follows based on the NEP 2020 and ICAR 6th Dean Committee Guidelines. Curriculum structure is provided in **Appendix - I**.
2. Major restructuring has taken place in the curriculum which is oriented towards continuous learning and assessment based on Module structure.
3. Major reformation has taken place in the curriculum by offering Skill Enhancement courses.
4. The curriculum is encompassing the courses that enable employability or entrepreneurship or skill development, provided in **Appendix - II**.
5. Total average percentage of syllabus revised was 30 % compared to previous curriculum provided in **Appendix - III**.
6. The significant changes are made in the content of all courses and hence the courses are considered as new courses provided in **Appendix - IV**.

Based on the feedback from various stakeholders and suggestions given by the members, the Chairperson of BoS told that, those fruitful suggestions would be incorporated appropriately in the curriculum and syllabi of the regulation R25 and this will be recommended to the Academic Council of VFSTR for the approval.

The following action points were pronounced during the BoS minutes. (**Appendix - V**)

There being no further points for discussion, the Chairperson thanks all the external, internal, invited members and announced that the meeting was adjourned.

Member Secretary

Chairperson

Dr. Hadole Mahesh Vinayak
Assistant Professor & Coordinator
Department of Agricultural Engineering
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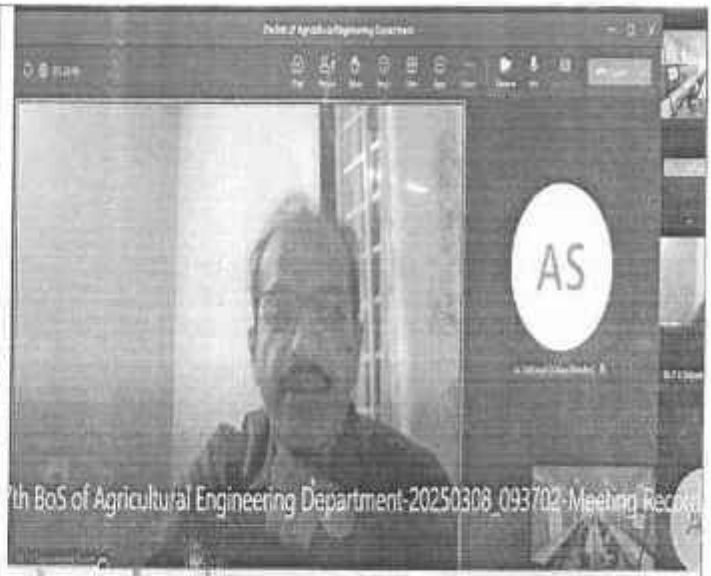
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08/03/2025

VIGNAN'S
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Estd u/s 3 of UGC Act 1956

DEPARTMENT OF AGRICULTURAL ENGINEERING

APPENDIX I

B.Tech Agricultural Engineering Programme: R25 C25 Curriculum Structure

I Year I Semester Structure

S. No.	Course Code	Course Title	L	T	P	SL	C	Remarks	Course Offered By
1.	25AG101	Deeksharambh	0	0	4	0	0	NG* (Non Gradial)	AG
2.	25AG102	Crop Production and Protection Technologies	3	0	2	3	4	Basic Sciences	AG
3.	25AG103	Introduction to Agricultural Engineering	3	0	2	3	4	Basic Engineering	AG
4.	25AG104	Surveying and Levelling	1	0	4	1	3	Basic Engineering	AG
5.	25AG105	Workshop Technology and Practice	0	0	4	0	2	Basic Engineering	AG
6.	25AG106	Basic Electrical Gadgets and Instruments	2	0	2	2	3	Basic Engineering	AG
7.	25AG107	Agricultural Informatics and Artificial Intelligence	2	0	2	2	3	Basic Engineering	CSE/IT
8.	25AG108 / 25AG109	NSS- I / NCC- I	0	0	2	0	1	Life Skills & Physical Fitness	AG
		Total	**11**	**0**	**22**	**11**	**20**		
		Contact Hours	40 Hours						

L=Lecture; T= Tutorial; P= Practical; C=Credits

I Year II Semester Structure

S. No.	Course Code	Course Title	L	T	P	SL	C	Remarks	Course Offered By
	25AG110	Repair And Maintenance Of Tractors And Power Tillers	0	0	8	0	4	Professional core	AG
2.	25AG111	Repair And Maintenance Of Pumps And Irrigation Systems	0	0	8	0	4	Professional core	AG
3.	25AG112	Engineering Drawing	0	0	4	0	2	Professional core	AG
4.	25AG113	Computer Programing and Data Structures	0	0	4	0	2	Professional core	CSE/IT
5.	25AG114	Farming Based Livelihood Systems	2	0	2	2	3	Professional core	AG
6.	2AG115	Environmental Studies and Disaster Management	2	0	2	2	3	Professional core	AG

7.	25AG116	Communication Skills	1	0	2	1	2	Professional core	English
8.	25AG117 / 25AG118	NSS-II / NCC- II	0	0	2	0	1	Life Skills & Physical Fitness	AG
		Total	**5**	**0**	**32**	**5**	**21**		
		Contact Hours	42 Hours						
Post - II Semester									
	25AG119	Internship (for 10 weeks, only for exit option for award of UG-Certificate)	0	0	20	0	10	Project	Industries

II Year I Semester Structure

S. No.	Course Code	Course Title	L	T	P	SL	C	Remarks	Course Offered By
	25AG201	Engineering Mathematics- I	3	0	0	3	3	Basic Science	Mathematics
2.	25AG202	Engineering Physics	2	0	2	2	3	Basic Science	Physics
3.	25AG203	Engineering Chemistry	2	0	2	2	3	Basic Science	Chemistry
4.	25AG204	Engineering Mechanics	2	0	2	2	3	Professional core	AG
5.	25AG205	Soil Mechanics	1	0	2	1	2	Professional core	AG
6.	25AG206	Fluid Mechanics and Open Channel Hydraulics	2	0	2	2	3	Professional core	AG
7.	25AG207	Engineering Properties of Agricultural Produce and Food Science	2	0	2	2	3	Professional core	AG
8.	25AG208	Farm Machinery & Equipment- I	2	0	2	2	3	Professional core	AG
9.	25AG209	Physical Education, First Aid, Yoga Practice and meditation	0	0	4	0	2	Life Skills & Physical Fitness	**AG**
10		**Total**	**16**	**0**	**18**	**16**	**25**		
		Contact Hours	50 Hours						

II Year II Semester Structure

S. No.	Course Code	Course Title	L	T	P	SL	C	Remarks	Course Offered By
	25AG210	Engineering Mathematics-II	3	0	0	3	3	Basic Sciences	Mathematics
2.	25AG211	Theory of Structures	1	0	2	1	2	Professional core	Civil/AG
3.	25AG212	Building Construction & Cost Estimation	2	0	0	2	2	Professional core	Civil/AG
4.	25AG213	Watershed Hydrology	2	0	2	2	3	Professional core	AG
5.	25AG214	Soil and Water Conservation Engineering	2	0	2	2	3	Professional core	AG
6.	25AG215	Farm Machinery & Equipment	2	0	2	2	3	Professional core	AG

		II							
7.	25AG216	Renewable Energy Sources	2	0	2	2	3	Professional core	AG
8.	25AG217	Post-harvest Engineering of Cereals, Pulses and Oilseeds	2	0	2	2	3	Professional core	AG
		Total	**16**	**0**	**12**	**16**	**22**		
		Contact Hours	50 Hours						
Post - IV Semester									
	25AG119	Internship (for 10 weeks, only for exit option for award of UG-Certificate)	0	0	20	0	10	Project	Industries

III Year I Semester Structure

S. No.	Course Code	Course Title	L	T	P	SL	C	Remarks	Course Offered By
	25AG301	Strength of Materials	1	0	2	1	2	Professional core	AG/Civil
2.	25AG302	Theory of Machines	2	0	0	2	2	Professional core	AG/Mech
3.	25AG303	Thermodynamics and Heat Transfer	3	0	0	3	3	Professional core	AG
4.	25AG304	Tractor & Automotive Engines	2	0	2	2	3	Professional core	AG
5.	25AG305	Irrigation and Drainage Engineering	3	0	2	3	4	Professional core	AG
6.	25AG306	Food and Dairy Engineering	3	0	2	3	4	Professional core	AG
7.	25AG307	Personality Development	1	0	2	1	2	Professional core	English
8.	25AG308	Seminar	0	0	2	0	1	Professional core	AG
9.	25AG309	Study tour	0	0	4	0	2	Professional core	AG
10		**Total**	**15**	**0**	**12+4***	**15**	**21+2***		
		Contact Hours	46 Hours						

III Year II Semester Structure

S. No.	Course Code	Course Title	L	T	P	SL	C	Remarks	Course Offered By
	25AG310	Tractor Systems & Controls	2	0	2	2	3	Professional core	AG
2.	25AG311	Groundwater, Wells and Pumps	2	0	2	2	3	Professional core	AG
3.	25AG312	Sensors, AI and Robotics in Agriculture	2	0	2	2	3	Professional core	CSE/IT
4.	25AG313	Agricultural Structures & Environment Control	2	0	2	2	3	Professional core	AG
5.	25AG314	Bioenergy Systems: Design and Applications	2	0	2	2	3	Professional core	AG

6.	25AG315	Refrigeration and Air-conditioning	2	0	2	2	3	Professional core	AG
7.	25AG316	Post-harvest Engineering of Horticultural Crops	1	0	2	1	2	Professional core	AG
8.	25AG317	Case Study	0	0	2	0	1	Professional core	AG
9.		**Total**	**13**	**0**	**16**	**13**	**21**		
		Contact Hours	42 Hours						

IV Year I semester

S. No.	Course Code	Course Title	L	T	P	SL	C	Remarks	Course Offered By
	25AG401	Project- I	0	0	6	0	3	Project	AG
2.	25AG402	Engineering Graphics and Design	0	0	4	0	2	Professional core	AG
3.	25AG403	Food Quality and Safety	2	0	2	2	3	Professional core	AG
4.	25AG404	Watershed Planning and Management	2	0	2	2	3	Professional core	AG
5.	25AG405	Sprinkler & Micro Irrigation Systems	1	0	2	1	2	Professional core	AG
6.	25AG406	Machine Design	2	0	0	2	2	Professional core	AG
7.	25AG407	Electrical Machines	2	0	2	2	3	Professional core	ECE/AG
8.	25AG408	Agricultural Statistics and Data Analysis	1	0	2	1	2	Professional core	Stat/AG
9.		**Total**	**10**	**0**	**20**	**10**	**20**		
		Contact Hours	40 Hours						

IV Year II semester

S. No.	Course Code	Course Title	L	T	P	SL	C	Remarks	Course Offered By
	25AG409	Project -II	0	0	8	0	4	Project	AG
2.	25AG410 / 25AG411	In-plant Training / Research Internship	0	0	16	0	8		AG
3.		Elective- I	2	0	2	2	3		AG
4.		Elective- II	2	0	2	2	3		AG
5.		Elective- III	2	0	2	2	3		AG
6.		**Total**	**6**	**0**	**30**	**6**	**21**		
		Contact Hours	42 Hours						

I. List of Department Elective Courses

S. No.	Course Code	Course Title	L	T	P	SL	C	Department Elective/Minor/Honour	Name of the Stream
1.	25AG801	Mechanics of Tillage and Traction	2	0	2	2	3	Dept. Elective	Stream-1
2.	25AG802	Farm Machinery Design and Production	2	0	2	2	3	Dept. Elective	Stream-1
3.	25AG803	Tractor Design and Testing	2	0	2	2	3	Dept. Elective	Stream-1
4.	25AG804	Hydraulic Drives and Controls	2	0	2	2	3	Dept. Elective	Stream-1
5.	25AG805	Human Engineering and Safety	2	0	2	2	3	Dept. Elective	Stream-1
6.	25AG806	Precision Agriculture and System Management	2	0	2	2	3	Dept. Elective	Stream-1
7.	25AG807	Photovoltaic Technology and Systems	2	0	2	2	3	Dept. Elective	Stream-1
8.	25AG808	Wind Power Technology and Systems	2	0	2	2	3	Dept. Elective	Stream-1
9.	25AG809	Waste and By-products Utilization	2	0	2	2	3	Dept. Elective	Stream-1
10.	25AG810	Floods and Control Measures	2	0	2	2	3	Dept. Elective	Stream-1
11.	25AG811	Remote Sensing and GIS Applications	2	0	2	2	3	Dept. Elective	Stream-1
12.	25AG812	Information Technology for Land and Water Management	2	0	2	2	3	Dept. Elective	Stream-1
13.	25AG813	Wasteland Development	2	0	2	2	3	Dept. Elective	Stream-2
14.	25AG814	Minor Irrigation and Command Area Development	2	0	2	2	3	Dept. Elective	Stream-2
15.	25AG815	Management of Canal Irrigation System	2	0	2	2	3	Dept. Elective	Stream-2
16.	25AG816	Water Quality and Management Measures	2	0	2	2	3	Dept. Elective	Stream-2
17.	25AG817	Landscape Irrigation Design and Management	2	0	2	2	3	Dept. Elective	Stream-2
18.	25AG818	Application of Plastics in Agriculture	2	0	2	2	3	Dept. Elective	Stream-2
19.	25AG819	Precision Farming Techniques for Protected Cultivation	2	0	2	2	3	Dept. Elective	Stream-2
20.	25AG820	Environmental Engineering	2	0	2	2	3	Dept. Elective	Stream-2
21.	25AG821	Development of Processed Food Products	2	0	2	2	3	Dept. Elective	Stream-2
22.	25AG822	Food Packaging Technology	2	0	2	2	3	Dept. Elective	Stream-2
23.	25AG823	Food Plant and Equipment Design	2	0	2	2	3	Dept. Elective	Stream-2
24.	25AG824	Emerging Technologies in Food Processing	3	0	0	3	3	Dept. Elective	Stream-2
25.	25AG825	Processing of Livestock, Fish and Marine Products	2	0	2	2	3	Dept. Elective	Stream-2
26.	25AG826	Food Business Management and Entrepreneurship Development	2	0	2	2	3	Dept. Elective	Stream-3
27.	25AG827	MATLAB Programming	1	0	4	1	3	Dept. Elective	Stream-3

28.	25AG828	Python Programming	1	0	4	1	3	Dept. Elective	Stream-3
29.	25AG829	Artificial Intelligence	2	0	2	2	3	Dept. Elective	Stream-3
30.	25AG830	Advances in Automation and Robotics in Agriculture	2	0	2	2	3	Dept. Elective	Stream-3
31.	25AG831	Machine Learning	2	0	2	2	3	Dept. Elective	Stream-3
32.	25AG832	Operations Research	3	0	0	3	3	Dept. Elective	Stream-3
33.	25AG833	Mechatronics	2	0	2	2	3	Dept. Elective	Stream-3
34.	25AG834	Natural Fibres: Extraction & Properties	2	0	2	2	3	Dept. Elective	Stream-3
35.	25AG835	Natural Fibre Applications in Agriculture	2	0	2	2	3	Dept. Elective	Stream-3
36.	25AG836	Processing of Natural Fibres	2	0	2	2	3	Dept. Elective	Stream-3
37.	25AG837	Agricultural Marketing and Trade	2	0	2	2	3	Dept. Elective	Stream-3

II. List of Open Elective Courses – No Course Offering

III. List of SWAYAM - NPTEL Courses

S.No	Course Name	NPTEL Course Offered by	Credits
1	Farm Machinery	IIT, Kharagpur	3
2	Irrigation and Drainage	IIT, Kharagpur	3
3	Micro Irrigation Engineering	IIT, Kharagpur	3
4	Post Harvest Operations and Processing of Fruits, Vegetables, Spices and Plantation Crop Products	IIT, Kharagpur	3
5	Dairy and Food Process and Products Technology	IIT, Kharagpur	3
6	Soil Fertility and Fertilizers	IIT, Kharagpur	3
7	Thermal Operations in Food Process Engineering: Theory and Applications	IIT, Kharagpur	3
8	Machine Learning For Soil And Crop Management	IIT, Kharagpur	3
9	Momentum Transfer in Process Engineering	IIT, Kharagpur	3
10	Fundamentals of Food Process Engineering	IIT, Kharagpur	3
11	Design of Farm Machinery	IIT, Kharagpur	3
12	Modern Food Packaging Technologies: Regulatory Aspects and Global Trends	IIT, Kharagpur	3
13	Traction Engineering	IIT, Kharagpur	3
14	Water Quality Management Practices	IIT, Kharagpur	3

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DEPARTMENT OF AGRICULTURAL ENGINEERING

APPENDIX II

List of Courses that Enables Employability or Entrepreneurship or Skill Development

S. No.	Course Code	Course Title	Year of Introduction	Employability / Entrepreneurship / Skill development
1	25AG110 & 25AG111	Skill Enhancement	2024	**Skill Development:** Skill enhancemer equips Agricultural Engineering graduate with practical expertise in moder technologies like precision farming, GIS, an renewable energy. It boosts employability fosters entrepreneurship, supports researcl and prepares for competitive exams. Thes programs bridge theory and practice, makin graduates industry-ready and capable o contributing to sustainable agricultur development.
2	25AG401	Project- I	2024	This project trains Agricultural Engineering graduates in farm machinery operation and maintenance while promoting entrepreneurship through custom hiring services, enhancing their technical skills, employability, and support for rural agricultural mechanization.
3	25AG409	Project- II	2024	This project equips Agricultural Engineering graduates with skills in precision agriculture tools like GPS, GIS, drones, and IoT-based smart farming systems, enhancing their technological competence and job readiness.
4	25AG410/ 25AG411	In-plant Training/ Research Internship	2024	This project offers Agricultural Engineering graduates hands-on in-plant training or research internships at agricultural research institutes, agro-industries, or farms. It enhances practical understanding of field operations, research methodologies, and modern technologies, thereby improving problem-solving skills, industry exposure, and readiness for professional or academic careers.

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DEPARTMENT OF AGRICULTURAL ENGINEERING

APPENDIX III

Comparison of Course Contents between R22 and R25-C25 Curriculums

S. No.	Course Code	Course Title	% of Changes	Justification for the changes
1.	25AG101	Deeksharambh	100%	Newly introduced it based on the industrial needs this course is included
2.	25AG102	Crop Production and Protection Technologies	100%	Newly introduced it based on the current scenario needs this course is included
3.	25AG103	Introduction to Agricultural Engineering	100%	Newly Introduced it to introduces engineering concepts for sustainable, efficient, and technology-driven agricultural development.
4.	25AG104	Surveying and Levelling	20%	Increased practical components
5.	25AG105	Workshop Technology and Practice	20%	Increased practical components
6.	25AG106	Basic Electrical Gadgets and Instruments	100%	Newly introduced it for understanding and operating modern agricultural electrical systems.
7.	25AG107	Agricultural Informatics and Artificial Intelligence	100%	Newly introduced it to enables data-driven decisions and smart solutions in modern agriculture.
8.	25AG108 / 25AG109	NSS- I / NCC- I	100%	Newly introduced it to develops discipline, leadership, teamwork, and social responsibility in students.
9.	25AG110	Repair And Maintenance Of Tractors And Power Tillers	100%	Newly Introduced it to builds hands-on skills for efficient machinery use and upkeep.
10.	25AG111	Repair And Maintenance Of Pumps And Irrigation Systems	100%	Newly introduced it to builds hands-on skills for efficient machinery use and upkeep.
11.	25AG112	Engineering Drawing	10%	Essential for visualizing and communicating technical designs in engineering applications.
12.	25AG113	Computer Programing and Data Structures	10%	Enhances problem-solving skills for agricultural automation and data management.
13.	25AG114	Farming Based Livelihood Systems	100%	Newly introduced it to promotes sustainable income

				generation through diversified, farm-based livelihood opportunities.
14.	2AG115	Environmental Studies and Disaster Management	15%	Promotes sustainability and preparedness for environmental and disaster-related challenges in agriculture.
15.	25AG116	Communication Skills	10%	Enhances effective verbal and written communication for academic and professional success.
16.	25AG117 / 25AG118	NSS-II / NCC- II	100%	Newly Introduced it to develops discipline, leadership, teamwork, and social responsibility in students.
17.	25AG201	Engineering Mathematics- I	30%	Provides essential mathematical foundation for solving core engineering problems effectively.
18.	25AG202	Engineering Physics	20%	Builds foundational understanding of physical principles applied in engineering solutions.
19.	25AG203	Engineering Chemistry	20%	Provides chemical principles essential for materials, fuels, and agricultural innovations.
20.	25AG204	Engineering Mechanics	15%	Builds foundational understanding of forces, motion, and mechanical system behavior.
21.	25AG205	Soil Mechanics	10%	Teaches soil behavior essential for designing stable agricultural structures and foundations.
22.	25AG206	Fluid Mechanics and Open Channel Hydraulics	15%	Explains fluid behavior crucial for irrigation, drainage, and water resource management.
23.	25AG207	Engineering Properties of Agricultural Produce and Food Science	20%	Teaches physical and chemical properties crucial for processing and quality control.
24.	25AG208	Farm Machinery & Equipment- I	100%	Newly introduced it to Introduces essential tools and machines for efficient farm operations and management.
25.	25AG209	Physical Education, First Aid, Yoga Practice and meditation	100%	Newly introduced it to promotes physical fitness, mental well-being, and essential life-saving skills.
26.	25AG210	Engineering Mathematics-II	20%	Advances mathematical techniques for modeling and solving complex engineering problems.
27.	25AG211	Theory of Structures	20%	Provides knowledge on designing and analyzing stable agricultural structures and machinery.

28.	25AG212	Building Construction & Cost Estimation	15%	Teaches construction techniques and cost analysis for agricultural buildings and infrastructure.
29.	25AG213	Watershed Hydrology	10%	Focuses on water movement and management for sustainable watershed development.
30.	25AG214	Soil and Water Conservation Engineering	5%	Teaches methods to prevent soil erosion and manage water sustainably for farming.
31.	25AG215	Farm Machinery & Equipment II	25%	Covers advanced machinery for improved farm productivity and mechanization techniques.
32.	25AG216	Renewable Energy Sources	30%	Introduces sustainable energy technologies to power agricultural operations and reduce costs.
33.	25AG217	Post-harvest Engineering of Cereals, Pulses and Oilseeds	10%	No change
34.	25AG301	Strength of Materials	100%	Newly Introduced it is essential for designing durable, safe agricultural structures and machinery components.
35.	25AG302	Theory of Machines	30%	Explains mechanical systems and motion vital for farm machinery design.
36.	25AG303	Thermodynamics and Heat Transfer	30%	Covers energy principles essential for efficient agricultural machinery and processes.
37.	25AG304	Tractor & Automotive Engines	10%	Understanding tractor engines boosts farm efficiency, sustainability, skills, and employability.
38.	25AG305	Irrigation and Drainage Engineering	30%	Teaches design and management of efficient water systems for agriculture.
39.	25AG306	Food and Dairy Engineering	5%	Focuses on processing, preservation, and engineering of food and dairy products
40.	25AG307	Personality Development	100%	Newly introduced it to enhances communication, confidence, and leadership skills for professional growth.
41.	25AG308	Seminar	100%	Newly Introduced it to develops research, presentation, and critical thinking skills through focused topic discussions.
42.	25AG309	Study tour	0%	No change
43.	25AG310	Tractor Systems & Controls	10%	Teaches operation and management of tractor systems for efficient farm mechanization.

44.	25AG311	Groundwater, Wells and Pumps	10%	Knowledge of groundwater, wells, and pumps ensures efficient, sustainable water use.
45.	25AG312	Sensors, AI and Robotics in Agriculture	100%	Newly Introduced it to introduces advanced technologies for precision farming, automation, and smart agricultural solutions.
46.	25AG313	Agricultural Structures & Environment Control	10%	Agricultural structures and environment control enhance productivity, sustainability, and resource management.
47.	25AG314	Bioenergy Systems: Design and Applications	10%	Bioenergy systems promote renewable energy use, sustainability, and rural development opportunities.
48.	25AG315	Refrigeration and Air-conditioning	30%	Covers cooling technologies vital for post-harvest storage and food preservation.
49.	25AG316	Post-harvest Engineering of Horticultural Crops	10%	Post-harvest engineering reduces losses, preserves quality, and adds market value.
50.	25AG317	Case Study	100%	Newly introduced it to enhances analytical skills by examining real-world agricultural engineering problems and solutions.
51.	25AG401	Project- I	100%	Newly Introduced it applies theoretical knowledge to practical agricultural engineering challenges through hands-on experience.
52.	25AG402	Engineering Graphics and Design	100%	Newly Introduced it to develop the skills in technical drawing and design for agricultural machinery and structures.
53.	25AG403	Food Quality and Safety	100%	Newly introduced it to focuses on maintaining standards to ensure safe, high-quality agricultural products.
54.	25AG404	Watershed Planning and Management	10%	Watershed planning ensures sustainable water use, soil conservation, and productivity.
55.	25AG405	Sprinkler & Micro Irrigation Systems	10%	Sprinkler and micro irrigation systems improve water efficiency, yield, and sustainability.
56.	25AG406	Machine Design	10%	Teaches principles of designing efficient and reliable agricultural machinery components.
57.	25AG407	Electrical Machines	30%	Covers operation and maintenance of electrical machines used in agricultural equipment.

58.	25AG408	Agricultural Statistics and Data Analysis	100%	Newly Introduced it to teaches statistical methods to analyze agricultural data for informed decision-making.
59.	25AG409	Project -II	100%	Newly Introduced it to provides advanced practical experience by applying engineering concepts to real-world agricultural problems.
60.	25AG410 / 25AG411	In-plant Training / Research Internship	100%	Newly Introduced it to offers hands-on industry or research experience, enhancing practical skills and professional readiness.

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DEPARTMENT OF AGRICULTURAL ENGINEERING

APPENDIX IV

List of New Courses in the R25-C25 Curriculum

S. No.	Course Code	Course Title	% of Change	Justification for the Changes
1.	25AG101	Deeksharambh	100%	Based on the industrial needs this course is included
2.	25AG102	Crop Production and Protection Technologies	100%	Based on the current scenario needs this course is included
3.	25AG103	Introduction to Agricultural Engineering	100%	Introduces engineering concepts for sustainable, efficient, and technology-driven agricultural development.
4.	25AG106	Basic Electrical Gadgets and Instruments	100%	Essential for understanding and operating modern agricultural electrical systems.
5.	25AG107	Agricultural Informatics and Artificial Intelligence	100%	Enables data-driven decisions and smart solutions in modern agriculture.
6.	25AG110	Repair And Maintenance Of Tractors And Power Tillers	100%	Builds hands-on skills for efficient machinery use and upkeep.
7.	25AG114	Farming Based Livelihood Systems	100%	Promotes sustainable income generation through diversified, farm-based livelihood opportunities.
8.	25AG208	Farm Machinery & Equipment- I	100%	Introduces essential tools and machines for efficient farm operations and management.
9.	25AG209	Physical Education, First Aid, Yoga Practice and meditation	100%	Promotes physical fitness, mental well-being, and essential life-saving skills.
10.	25AG301	Strength of Materials	100%	Essential for designing durable, safe agricultural structures and machinery

				components.
11.	25AG307	Personality Development	100%	Enhances communication, confidence, and leadership skills for professional growth.
12.	25AG312	Sensors, AI and Robotics in Agriculture	100%	Introduces advanced technologies for precision farming, automation, and smart agricultural solutions.
13.	25AG402	Engineering Graphics and Design	100%	To develop the skills in technical drawing and design for agricultural machinery and structures.
14.	25AG403	Food Quality and Safety	100%	Focuses on maintaining standards to ensure safe, high-quality agricultural products.
15.	25AG408	Agricultural Statistics and Data Analysis	100%	Teaches statistical methods to analyze agricultural data for informed decision-making.

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APPENDIX - V

I. Details of IKS Components Incorporated in R25-C25 Curriculum

Course Type	Total number of Courses	Number of Courses Incorporating IKS	Percentage
Professional Core	35	35	100%
Department Electives	37	0	0%
Open Electives	0	0	0%
Minors	0	0	0%
Honours	0	0	0%
Total	**72**	**35**	-

II. List of Courses in the R25-C25 Curriculum Incorporating IKS

S. No.	Course Code	Course Title	Type of course	Module (Unit)	IKS Components Incorporated
1.	25AG114	Farming Based Livelihood Systems	Professional Core	M1 (U1, U2)	• Traditional seed preservation (ash, neem leaves, mud pots). • Indigenous water-harvesting systems (johad, tanka, ahar-pyne)
				M2 (U1, U2)	• Traditional seed preservation & organic nutrient practices • Indigenous water harvesting & agroforestry traditions
2.	25AG115	Environmental Studies and Disaster Management	Professional Core	M1 (U1, U2)	• Traditional water conservation & irrigation practices • Indigenous forest and biodiversity management
3.	25AG116	Communication Skills	Professional Core	M2 (U1, U2)	• Nāṭyaśāstra's non-verbal communication principles • Chanakya's interpersonal communication & persuasion strategies.
4.	25AG204	Engineering Mechanics	Professional Core	M1 (U1, U2)	• Sūrya Siddhānta's principles of motion & celestial mechanics • Āyodha-era architectural balance using traditional force–moment concepts.
5.	25AG205	Soil Mechanics	Professional Core	M2 (U1, U2)	• Traditional soil stability practices in earthen structures (embankments, mud houses, bunds) • Indigenous compaction methods using wooden rammers & layered soil preparation
6.	25AG206	Fluid Mechanics and Open Channel	Professional Core	M1 (U1, U2)	• Ancient Indian stepwells and irrigation channels illustrating

		Hydraulics			hydrostatic pressure, continuity, and Bernoulli's principle. • Traditional Indian boat-building practices demonstrating buoyancy, flotation, metacentric height, and stability.
7.	25AG207	Engineering Properties of Agricultural Produce and Food Science	Professional Core	M1 (U1, U2)	• Traditional grain storage and winnowing practices illustrating physical, thermal, and aerodynamic properties of produce. • Indigenous fermentation and food preservation methods demonstrating rheological, biochemical, and microbiological properties.
8.	25AG208	Farm Machinery & Equipment- I	Professional Core	M1 (U1, U2)	• Traditional Indian farm implements illustrating indigenous knowledge of farm mechanization and crop production operations. • Ancient Indian metallurgical practices (wootz steel, heat treatment) demonstrating materials selection and strengthening of agricultural tools.
9.	25AG211	Theory of Structures	Professional Core	M2 (U1, U2)	• Ancient Indian structural design practices illustrating empirical concepts of load transfer and section behavior. • Traditional foundation and beam systems demonstrating stability and load distribution.
10.	25AG212	Building Construction & Cost Estimation	Professional Core	M2 (U1, U2)	• Traditional stone, lime, and brick construction illustrating material properties and durability. • Ancient use of timber and metals demonstrating material selection and structural application.
11.	25AG213	Watershed Hydrology	Professional Core	M1 (U1, U2)	• Traditional rainwater harvesting illustrating rainfall and runoff management. • Ancient infiltration and storage methods demonstrating water conservation.
12.	25AG214	Soil and Water Conservation Engineering	Professional Core	M2 (U1, U2)	• Traditional soil conservation illustrating erosion control. • Ancient soil loss estimation demonstrating sustainable farming.
13.	25AG215	Farm Machinery & Equipment II	Professional Core	M1 (U1, U2)	• Traditional sprayers and manual weeders demonstrating indigenous pest and weed management.

					• Ancient fertilizer and harvesting tools illustrating crop nutrition and harvesting practices.
14.	25AG216	Renewable Energy Sources	Professional Core	M1 (U1, U2)	• Ancient solar and wind energy devices illustrating solar heating, windmills, and energy harnessing. • Traditional biomass and biogas practices demonstrating anaerobic digestion and renewable energy use.
15.	25AG217	Post-harvest Engineering of Cereals, Pulses and Oilseeds	Professional Core	M2 (U1, U2)	• Traditional grain cleaning and handling demonstrating material separation and conveying. • Ancient drying and storage methods illustrating moisture control and preservation.
16.	25AG218	Entrepreneurship Development and Business Management	Professional Core	M2 (U1, U2)	• Traditional Indian trade and craft practices demonstrating entrepreneurial skills and social motivation. • Ancient market and opportunity identification methods illustrating environment scanning and business initiation.
17.	25AG301	Strength of Materials	Professional Core	M1 (U1, U2)	• Ancient Indian timber and stone construction demonstrating strength of materials and beam deflection. • Traditional pillar and column designs illustrating structural analysis and load-bearing principles.
18.	25AG302	Theory of Machines	Professional Core	M1 (U1, U2)	• Ancient mechanical devices demonstrating mechanisms, links, and kinematics. • Traditional gear systems illustrating gear motion and velocity relations.
19.	25AG303	Thermodynamics and Heat Transfer	Professional Core	M2 (U1, U2)	• Ancient thermal devices demonstrating conduction, convection, and radiation. • Traditional heat management systems illustrating heat transfer and material properties.
20.	25AG304	Tractor & Automotive Engines	Professional Core	M2 (U1, U2)	• Traditional animal and water-powered implements demonstrating farm power principles. • Ancient airflow and valve mechanisms illustrating engine operation and efficiency.
21.	25AG305	Irrigation and Drainage Engineering	Professional Core	M1 (U1, U2)	• Traditional Indian irrigation systems (stepwells, canals, tanks) demonstrating water measurement and distribution. • Ancient soil-water management

					practices illustrating soil moisture control, plant response, and irrigation efficiency.
22.	25AG306	Food and Dairy Engineering	Professional Core	M1 (U1, U2)	• Traditional food drying methods (sun drying, smoke drying) demonstrating dehydration and preservation of foods. • Ancient thermal processing and packaging practices illustrating evaporation, sterilization, and safe storage.
23.	25AG310	Tractor Systems & Controls	Professional Core	M2 (U1, U2)	• Traditional mechanical devices demonstrating clutch and gear operation. • Ancient power transmission methods illustrating differential, braking, and energy control.
24.	25AG311	Groundwater, Wells and Pumps	Professional Core	M2 (U1, U2)	• Traditional wells and stepwells demonstrating groundwater occurrence, movement, and exploration. • Ancient water lifting devices (shadoofs, Persian wheels) illustrating well hydraulics and pump operation.
25.	25AG312	Sensors, AI and Robotics in Agriculture	Professional Core	M1 (U1, U2)	• Traditional monitoring tools demonstrating sensing and measurement principles. • Ancient plant and soil assessment methods illustrating environmental sensing.
26.	25AG313	Agricultural Structures & Environment Control	Professional Core	M1 (U1, U2)	• Traditional farmstead and animal shelters demonstrating environmental control. • Ancient greenhouse and storage practices illustrating plant environment management.
27.	25AG314	Bioenergy Systems: Design and Applications	Professional Core	M1 (U1, U2)	• Traditional biomass fermentation demonstrating aerobic and anaerobic processes. • Ancient energy plantations illustrating biomass harvesting and preparation.
28.	25AG315	Refrigeration and Air-conditioning	Professional Core	M1 (U1, U2)	• Ancient ice storage and cooling methods demonstrating phase change and substance properties. • Traditional refrigeration practices illustrating low-temperature production and preservation.
29.	25AG316	Post-harvest Engineering of Horticultural Crops	Professional Core	M2 (U1, U2)	• Traditional post-harvest practices demonstrating processing and preservation. • Ancient preservation methods illustrating quality maintenance.

30.	25AG403	Food Quality and Safety	Professional Core	M2 (U1, U2)	• Traditional sensory evaluation demonstrating food quality assessment. • Ancient food safety practices illustrating adulteration control and hygiene.
31.	25AG404	Watershed Planning and Management	Professional Core	M1 (U1, U2)	• Traditional water harvesting and watershed practices demonstrating management and budgeting. • Ancient participatory land management illustrating integrated watershed use.
32.	25AG405	Sprinkler & Micro Irrigation Systems	Professional Core	M1 (U1, U2)	• Traditional irrigation methods demonstrating sprinkler irrigation principles. • Ancient localized watering techniques illustrating micro-irrigation and fertigation.
33.	25AG406	Machine Design	Professional Core	M1 (U1, U2)	• Traditional mechanical design of tools and structures demonstrating material selection and static load considerations. • Ancient engineering practices illustrating stress management, fatigue, and design for durability.
34.	25AG407	Electrical Machines	Professional Core	M1 (U1, U2)	• Traditional electrical devices demonstrating electrical machine operation. • Ancient coil and magnetic systems illustrating voltage transformation and efficiency.
35.	25AG408	Agricultural Statistics and Data Analysis	Professional Core	M1 (U1, U2)	• Traditional data recording demonstrating frequency distribution and analysis. • Ancient calculation techniques illustrating central tendency and dispersion.

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APPENDIX - VI

I. Details of SDG Mapped Courses in R25-C25 Curriculum

Course Type	Total number of Courses	Number of Courses Mapped with SDGs	Percentage
Professional Core	35	35	100%
Department Electives	37	0	0%
Open Electives	0	0	0%
Minors	0	0	0%
Honours	0	0	0%
Total	72	35	-

II. List of R25-C25 Courses Mapped with SDGs along with Justification

S. No.	Course Code	Course Title	Type of course	SDGs covered	Justification
1	25AG102	Crop Production and Protection Technologies	Basic Sciences	2	It aims to end hunger, achieve food security, improve nutrition.
				3	The course promotes safe and sustainable crop production practices.
				4	It develops knowledge and skills in modern crop production
				6	The course promotes efficient water use and irrigation practices, ensuring sustainable water management.
				12	It encourages responsible input use and sustainable farming practices.
				13	The course fosters sustainable input use and eco-friendly farming.
2	25AG114	Farming Based Livelihood Systems	Professional core	1	Enhancing farm productivity and livelihood strategies reduces rural poverty
				2	Adoption of sustainable farming practices ensures increased food production, and improved nutrition
				4	Training farmers on modern agricultural techniques, resource management, and livelihood diversification.
				8	Development of farm-based enterprises, value addition, and market linkages.
				9	Introducing farm mechanization.

					processing technologies, and rural infrastructure fosters innovation and value chain
3	25AG115	Environmental Studies and Disaster Management	Professional core	1	No Poverty: Effective disaster management reduces the economic losses of vulnerable populations, preventing poverty escalation.
				2	Zero Hunger: Environmental sustainability and disaster preparedness ensure stable food production and supply.
				4	Quality Education: Awareness programs, training, and education on environmental issues.
				13	Climate Action: Studying environmental processes and disasters fosters mitigation and adaptation strategies.
4	25AG116	Communication Skills	Professional core	1	No Poverty: Effective communication enhances access to information, resources, and opportunities.
				10	Reduced Inequalities: Developing communication skills fosters inclusive dialogue, social cohesion.
				11	Sustainable Cities and Communities: Clear communication supports community engagement, awareness campaigns, and participatory planning.
				17	Partnerships for the Goals: Strong communication skills are essential for collaboration, networking, and partnerships across sectors.
5	25AG204	Engineering Mechanics	Professional core	4	Quality Education: Teaching Engineering Mechanics develops critical thinking, problem-solving.
				8	Decent Work and Economic Growth: Knowledge of mechanics enables the design and development of efficient machines and structures.
				9	Industry, Innovation, and Infrastructure: Understanding mechanics underpins innovation in engineering design, infrastructure development.
				10	Reduced Inequalities: Engineering solutions designed using mechanics principles can improve access to essential services and infrastructure.
6	25AG205	Soil Mechanics	Professional core	6	Clean Water and Sanitation: Understanding soil properties aids in groundwater recharge, filtration.
				7	Affordable and Clean Energy: Knowledge of soil mechanics

					supports the safe installation of renewable energy structures.
				9	Industry, Innovation, and Infrastructure: Soil analysis is essential for designing stable infrastructure, roads and buildings.
				15	Life on Land: Soil conservation and management prevent erosion, maintain fertility, and support sustainable agriculture and ecosystems.
7	25AG206	Fluid Mechanics and Open Channel Hydraulics	Professional core	9	It helps to Understanding fluid flow and hydraulics is crucial for designing efficient water conveyance systems, dams, and irrigation infrastructure.
				13	Climate Action: Hydraulic knowledge aids in flood management, stormwater control, and adaptation to climate.
				14	Life Below Water: Proper water flow management prevents pollution, protects aquatic ecosystems.
				17	Partnerships for the Goals: Fluid mechanics expertise enables collaborative water resource management, integrated watershed planning.
8	25AG207	Engineering Properties of Agricultural Produce and Food Science	Professional core	1	**No Poverty:** Improved post-harvest handling and processing increase farmers' income and reduce economic vulnerability.
				2	**Zero Hunger:** Proper understanding of food properties and preservation ensures food quality, safety, and availability.
				15	**Life on Land:** Sustainable processing and storage practices reduce wastage and support responsible land and crop management.
				17	**Partnerships for the Goals:** Collaboration across food science, agriculture, and industry fosters innovation.
9	25AG208	Farm Machinery & Equipment- I	Professional core	1	**No Poverty:** Farm mechanization improves productivity and reduces labor drudgery, increasing farm income and livelihood security.
				2	**Zero Hunger:** Efficient machinery enables timely farm operations, enhancing crop production and food availability.
				8	**Decent Work and Economic Growth:** Use of appropriate farm

					machinery creates skilled employment.
				15	**Life on Land:** Mechanized and precision farming practices help conserve soil, reduce land degradation.
				17	**Partnerships for the Goals:** Collaboration among farmers, engineers, manufacturers, and institutions.
10	25AG211	Theory of Structures	Professional core	3	**Good Health and Well-Being:** Structural analysis ensures safe and stable buildings and infrastructure.
				11	**Sustainable Cities and Communities:** Knowledge of structural behavior supports the design of resilient, durable, and sustainable urban and rural infrastructure.
				12	**Responsible Consumption and Production:** Efficient structural design optimizes material use, minimizes waste, and promotes sustainable construction practices.
				17	**Partnerships for the Goals:** Structural engineering projects require collaboration among engineers, planners, policymakers, and construction agencies.
11	25AG212	Building Construction & Cost Estimation	Professional core	3	**Good Health and Well-Being:** Proper selection of building materials, ventilation, damp proofing, and safe construction practices ensure healthy and safe living and working environments.
				12	**Responsible Consumption and Production:** Efficient material use, cost estimation, and waste minimization promote sustainable construction and responsible resource utilization.
				17	**Partnerships for the Goals:** Building projects require coordination among engineers, contractors, suppliers, and regulatory bodies to achieve cost-effective and sustainable development.
12	25AG213	Watershed Hydrology	Professional core	2	**Zero Hunger:** Effective watershed management ensures reliable water availability, improving agricultural productivity and food security.
				6	**Clean Water and Sanitation:** Hydrologic analysis supports sustainable water conservation, groundwater recharge, and efficient

					water use within watersheds.
				15	**Life on Land:** Watershed hydrology helps control soil erosion, conserve land resources, and protect terrestrial ecosystems.
				17	**Partnerships for the Goals:** Integrated watershed development requires collaboration among communities, engineers, institutions, and policymakers for sustainable outcomes.
13	25AG214	Soil and Water Conservation Engineering	Professional core	1	**No Poverty:** Soil and water conservation practices enhance farm productivity and income stability, reducing rural poverty.
				11	**Sustainable Cities and Communities:** Erosion control, flood mitigation, and watershed management improve resilience of rural and peri-urban settlements.
				15	**Life on Land:** Conservation engineering prevents land degradation, controls erosion, and restores soil health and terrestrial ecosystems.
				17	**Partnerships for the Goals:** Successful conservation programs require collaboration among farmers, engineers, institutions, and government agencies.
14	25AG215	Farm Machinery & Equipment II	Professional core	2	**Zero Hunger:** Advanced farm machinery enables timely harvesting, processing, and reduced post-harvest losses, ensuring food security.
				8	**Decent Work and Economic Growth:** Mechanization improves labor efficiency, creates skilled technical jobs, and supports agro-industrial growth.
				12	**Responsible Consumption and Production:** Efficient machine design and operation minimize fuel use, reduce wastage, and promote sustainable resource utilization.
				17	**Partnerships for the Goals:** Collaboration among farmers, manufacturers, engineers, and institutions enhances technology development, dissemination, and adoption.
15	25AG216	Renewable Energy Sources	Professional core	7	**Affordable and Clean Energy:** The course promotes understanding and application of renewable technologies to ensure access to sustainable and clean energy.

				8	**Decent Work and Economic Growth:** Renewable energy deployment creates green jobs, supports energy entrepreneurship, and stimulates sustainable economic growth.
				12	**Responsible Consumption and Production:** Emphasis on efficient energy conversion and resource use encourages sustainable production and reduced environmental impact.
				17	**Partnerships for the Goals:** Achieving renewable energy targets requires collaboration among governments, industries, researchers, and communities.
16	25AG217	Post-harvest Engineering of Cereals, Pulses and Oilseeds	Professional core	1	**No Poverty:** Improved post-harvest technologies reduce losses, enhance value addition, and increase farmers' income and livelihood security.
				3	**Good Health and Well-Being:** Safe handling, storage, and processing of grains ensure food safety, reduce contamination, and protect consumer health.
				12	**Responsible Consumption and Production:** Efficient post-harvest systems minimize wastage, optimize resource use, and promote sustainable food production.
				17	**Partnerships for the Goals:** Collaboration among farmers, engineers, processors, and institutions strengthens post-harvest infrastructure and technology adoption.
17	25AG218	Entrepreneurship Development and Business Management	Professional core	1	**No Poverty:** Entrepreneurship development promotes self-employment, income generation, and sustainable livelihoods, reducing poverty.
				4	**Quality Education:** The course builds managerial, financial, and entrepreneurial skills essential for lifelong learning and enterprise development.
				17	**Partnerships for the Goals:** Business success relies on collaboration with stakeholders, institutions, markets, and support agencies to foster sustainable enterprises.
18	25AG301	Strength of	Professional core	4	**Quality Education:** Understanding material behavior and structural performance develops critical

		Materials			engineering knowledge and problem-solving skills.
				8	**Decent Work and Economic Growth:** Knowledge of material strength enables safe and efficient design of structures and machines, supporting industrial growth and skilled employment.
				11	**Sustainable Cities and Communities:** Proper material selection and design ensure durable, safe, and sustainable infrastructure for urban and rural communities.
				12	**Responsible Consumption and Production:** Efficient use of materials and optimization in design minimize waste and promote sustainable construction and manufacturing practices.
19	25AG302	Theory of Machines	Professional core	4	**Quality Education:** Studying machine kinematics and dynamics develops analytical, problem-solving, and technical skills essential for engineers.
				7	**Affordable and Clean Energy:** Understanding mechanisms and power transmission supports efficient energy use and development of energy-saving machines.
				9	**Industry, Innovation, and Infrastructure:** Knowledge of machines enables design, innovation, and improvement of industrial machinery and infrastructure.
				17	**Partnerships for the Goals:** Collaboration between engineers, industries, and researchers promotes innovation, technology transfer, and sustainable mechanical solutions.
20	25AG303	Thermodynamics and Heat Transfer	Professional core	4	**Quality Education:** Understanding thermodynamic principles and heat transfer enhances technical knowledge and analytical skills in engineering.
				8	**Decent Work and Economic Growth:** Knowledge of energy systems and heat transfer enables development of efficient machines and industrial processes, promoting skilled employment.
				13	**Climate Action:** Thermodynamics and heat transfer principles are critical for designing energy-efficient systems and reducing greenhouse gas emissions.

				17	**Partnerships for the Goals:** Collaborative research and application of energy-efficient technologies require partnerships among engineers, industries, and institutions.
21	25AG304	Tractor & Automotive Engines	Professional core	4	**Quality Education:** Understanding engine principles and performance analysis develops technical skills and engineering competency.
				7	**Affordable and Clean Energy:** Knowledge of engine efficiency and alternative fuels supports sustainable and energy-efficient tractor and automotive operations.
				9	**Industry, Innovation, and Infrastructure:** Engine design and optimization drive innovation in agricultural and automotive machinery, supporting industrial development.
				17	**Partnerships for the Goals:** Collaboration among engineers, manufacturers, researchers, and farmers ensures effective technology transfer and adoption.
22	25AG305	Irrigation and Drainage Engineering	Professional core	1	**No Poverty:** Efficient irrigation and drainage systems improve crop yields and farm income, reducing rural poverty.
				2	**Zero Hunger:** Proper water management ensures reliable crop production, enhancing food security and nutrition.
				13	**Climate Action:** Irrigation and drainage planning helps adapt to climate variability, mitigating flood and drought impacts.
				15	**Life on Land:** Sustainable water management prevents soil degradation, erosion, and salinization, protecting terrestrial ecosystems.
23	25AG306	Food and Dairy Engineering	Professional core	2	**Zero Hunger:** Efficient food processing and dairy technologies improve food availability, nutrition, and reduce post-harvest losses.
				6	**Clean Water and Sanitation:** Proper hygiene and water management in food and dairy processing ensure safe and sustainable water use.
				8	**Decent Work and Economic Growth:** Food and dairy processing industries create skilled employment

					and support rural economic development.
				12	**Responsible Consumption and Production:** Adoption of efficient processing, preservation, and waste management practices promotes sustainable food production and consumption.
24	25AG310	Tractor Systems & Controls	Professional core	2	**Zero Hunger:** Efficient tractor systems enable timely farm operations, increasing crop productivity and food availability.
				3	**Good Health and Well-Being:** Modern tractor controls reduce operator fatigue and enhance safety, protecting health and well-being.
				7	**Affordable and Clean Energy:** Knowledge of energy-efficient tractor systems supports reduced fuel consumption and sustainable energy use.
				12	**Responsible Consumption and Production:** Optimized tractor systems and controls minimize fuel and resource wastage, promoting sustainable agricultural practices.
25	25AG311	Groundwater, Wells and Pumps	Professional core	1	**No Poverty:** Efficient groundwater utilization and pumping systems improve irrigation, crop yield, and farmers' income.
				2	**Zero Hunger:** Proper groundwater management ensures reliable water supply for agriculture, enhancing food security.
				12	**Responsible Consumption and Production:** Optimized pumping systems and sustainable groundwater use minimize resource wastage.
				15	**Life on Land:** Groundwater conservation practices prevent over-extraction, maintain soil health, and protect terrestrial ecosystems.
26	25AG312	Sensors, AI and Robotics in Agriculture	Professional core	2	**Zero Hunger:** Precision farming using sensors, AI, and robotics improves crop productivity and reduces losses, enhancing food security.
				4	**Quality Education:** Learning and applying advanced technologies builds technical skills, digital literacy, and innovation capabilities in agriculture.
				9	**Industry, Innovation, and Infrastructure:** Adoption of smart

					agricultural technologies promotes innovation, mechanization, and efficient agricultural infrastructure.
				15	**Life on Land:** Technology-driven monitoring and management reduce overuse of land resources, prevent degradation, and support sustainable farming practices.
27	25AG313	Agricultural Structures & Environment Control	Professional core	2	**Zero Hunger:** Efficient farm structures and controlled environments improve crop and livestock productivity, enhancing food security.
				6	**Clean Water and Sanitation:** Design and management of agricultural structures ensure proper water storage, distribution, and sanitation for farming systems.
				9	**Industry, Innovation, and Infrastructure:** Development of innovative agricultural buildings, greenhouses, and storage facilities strengthens rural infrastructure and mechanization.
				13	**Climate Action:** Environmentally controlled farm structures and climate-smart designs help mitigate climate impacts, optimize resource use, and enhance resilience to extreme weather events.
28	25AG314	Bioenergy Systems: Design and Applications	Professional core	7	**Affordable and Clean Energy:** Bioenergy systems provide sustainable, renewable energy solutions for agricultural and industrial applications.
				13	**Climate Action:** Using biomass for energy reduces greenhouse gas emissions, contributing to climate change mitigation.
				15	**Life on Land:** Sustainable biomass sourcing and management preserve soil health, biodiversity, and prevent land degradation.
29	25AG315	Refrigeration and Air-conditioning	Professional core	2	**Zero Hunger:** Efficient refrigeration and cold storage systems reduce post-harvest losses, preserving food quality and availability.
				7	**Affordable and Clean Energy:** Energy-efficient refrigeration and air-conditioning technologies support sustainable and clean energy use.
				9	**Industry, Innovation, and Infrastructure:** Development and adoption of modern refrigeration and HVAC systems promote industrial

					innovation and resilient infrastructure.
				13	**Climate Action:** Designing eco-friendly and energy-efficient cooling systems reduces greenhouse gas emissions and mitigates climate impacts.
30	25AG316	Post-harvest Engineering of Horticultural Crops	Professional core	2	**Zero Hunger:** Efficient post-harvest handling and processing of fruits, vegetables, and flowers reduce losses and enhance food availability.
				8	**Decent Work and Economic Growth:** Post-harvest technology development creates skilled employment opportunities and supports agro-industrial growth.
				9	**Industry, Innovation, and Infrastructure:** Modern storage, processing, and packaging technologies promote innovation and strengthen horticultural infrastructure.
				12	**Responsible Consumption and Production:** Efficient post-harvest practices minimize waste and optimize the use of agricultural resources.
31	25AG403	Food Quality and Safety	Professional core	3	**Good Health and Well-Being:** Ensuring food quality and safety protects consumers from foodborne illnesses and enhances public health.
				6	**Clean Water and Sanitation:** Proper food processing and hygiene practices reduce water contamination and promote safe water use.
				12	**Responsible Consumption and Production:** Quality control, food safety measures, and waste minimization promote sustainable production.
				15	**Life on Land:** Sustainable sourcing, processing, and disposal of food products help conserve terrestrial ecosystems.
32	25AG404	Watershed Planning and Management	Professional core	2	**Zero Hunger:** Proper watershed planning ensures reliable water availability for agriculture, improving crop productivity and food security.
				6	**Clean Water and Sanitation:** Watershed management promotes sustainable water conservation, storage, and distribution for agriculture.
				15	**Life on Land:** Soil and water

					conservation, afforestation, and land management maintain ecosystem health and prevent land degradation.
				17	**Partnerships for the Goals:** Successful watershed management requires collaboration among local communities, government agencies, researchers, and NGOs.
33	25AG405	Sprinkler & Micro Irrigation Systems	Professional core	2	**Zero Hunger:** Efficient irrigation systems enhance crop productivity and ensure food security.
				6	**Clean Water and Sanitation:** Sprinkler and micro-irrigation technologies optimize water use and promote sustainable water management.
				8	**Decent Work and Economic Growth:** Adoption and maintenance of modern irrigation systems create skilled jobs and support agricultural economic growth.
				15	**Life on Land:** Controlled irrigation prevents soil erosion, salinization, and land degradation, conserving terrestrial ecosystems.
34	25AG406	Machine Design	Professional core	8	**Decent Work and Economic Growth:** Designing efficient and reliable machines promotes industrial growth, productivity, and skilled employment.
				9	**Industry, Innovation, and Infrastructure:** Machine design fosters technological innovation, development of industrial infrastructure, and modern manufacturing practices.
				11	**Sustainable Cities and Communities:** Properly designed machines contribute to sustainable construction, manufacturing, and urban development.
				13	**Climate Action:** Energy-efficient and environmentally friendly machine designs help reduce emissions and mitigate climate impacts.
35	25AG407	Electrical Machines	Professional core	2	**Zero Hunger:** Efficient electrical machines in agricultural applications improve irrigation, processing, and food production.
				7	**Affordable and Clean Energy:** Understanding and designing electrical machines supports energy-efficient operations.
				9	**Industry, Innovation, and**

					Infrastructure: Electrical machines are fundamental to industrial automation, infrastructure development.
				13	**Climate Action:** Energy-efficient electrical machines reduce electricity consumption and greenhouse gas emissions, supporting climate mitigation.
36	25AG408	Agricultural Statistics and Data Analysis	Professional core	4	**Quality Education:** Developing statistical and analytical skills enhances research, data interpretation, and evidence-based decision-making in agriculture.
				8	**Decent Work and Economic Growth:** Proficiency in data analysis supports agricultural planning, efficiency, and creation of skilled employment.
				16	**Peace, Justice, and Strong Institutions:** Accurate data collection and analysis strengthen transparency, accountability, and informed policy-making in the agricultural sector.
				17	**Partnerships for the Goals:** Statistical insights enable collaboration between farmers, researchers, and institutions.

III. Mapping of R25-C25 Courses with individual SDGs

SDG No.	SDG Name	No. of courses mapped	Percentage of courses mapped
1	No Poverty	20	576%
2	Zero Hunger	25	71%
3	Good Health and Well-Being	14	40%
4	Quality Education	22	63%
5	Gender Equality	6	17%
6	Clean Water and Sanitation	16	46%
7	Affordable and Clean Energy	14	40%
8	Decent Work and Economic Growth	35	100%
9	Industry, Innovation and Infrastructure	35	100%
10	Reduced Inequalities	12	34%
11	Sustainable Cities and Communities	29	83%
12	Responsible Consumption and Production	34	97%
13	Climate Action	25	71%
14	Life Below Water	2	6%
15	Life On Land	14	40%

16	Peace, Justice and Strong Institutions	2	6%
17	Partnerships for the Goals	28	80%

Member Secretary

Chairperson

VIGNAN'S
Foundation for Science, Technology & Research
(Deemed to be University)
Estd. u/s 3 of UGC Act 1956

DEPARTMENT OF AGRICULTURAL ENGINEERING

APPENDIX VII

Action Taken Report (ATR) on the suggestions given in earlier BoS meetings

S.No.	Action Point	Response
1.	Follow ICAR and maintain evaluation pattern (50:50) and passing criteria (50 %) as per ICAR and maximum 25 credit load to each semester.	Evaluation pattern (50:50), passing criteria (50 %) and maximum 25 credit limit is followed as it is as per ICAR in each semester.
2.	All courses content including theory and practices addition or deletion as per the suggestions given by respective expert members	All courses content including theory and practices addition or deletion as per the suggestions given by respective expert members is incorporated in the revise syllabus of respective courses.
3.	Prepare a specific list of NPTEL or MOOCs courses for M. Tech (FM) that students can follow for the Add-on degree.	Specific list of NPTEL or MOOCs courses is prepared and communicated for approval.
4.	Pursue for ICAR Accreditation	A committee has been formulated to prepare for ICAR accreditation requirements. A final plan of obtaining accreditation will be presented in coming BoS meeting.

Member Secretary

Chairperson