Course Layout (VI Dean Committee)

B.Tech. (Agril. Engg.)

Semester I (New)				
Sr.No.	**Course No.**	**Course Title**	**Credit Hours**	**Remark**
1.	CAC-111	*Deekshaarambh* Induction-cum-Foundation course	2(0+2)	(NG) 2week
2.	AEC-111	National Service Scheme(NSS-I)/ National Cadet Corps (NCC-I)	1(0+1)	
3.	AEC-112	Communication Skills	2(2+0)	
4.	MDC-111	Farming-based Livelihood Systems	3(2+1)	
5.	MATH-111*	Basic Mathematics*	2 (2+0)	NG & Need-based
6.	AGEN-111	Crop Production and Protection Technology	4(3+1)	
7.	GAE-111	Introduction to Agricultural Engineering	4(3+1)	
8.	REE-111	Basic Electrical Gadgets and Instruments	3(2+1)	
9.	COMP-111	Agricultural Informatics and Artificial Intelligence	3(2+1)	
		Total Credits Hrs.	**20(11+9) G 4(2+2) NG**	
CAC: Common Academic Course, **AEC:** Ability Enhancement Course, **MDC:** Multidisciplinary Course, **SEC:** Skill Enhancement Course, **G:** Gradial, **NG:** Non-Gradial				
Note: *MATH-111 for PCB student and for PCM or PCMB student, there is no need to offer any Need-based course.				
Semester II				
Sr.No.	**Course No.**	**Course Title**	**Credit Hours**	**Remark**
1.	AEC-123	National Service Scheme-II (NSS-II)/ National Cadet Corps-II (NCC-II)	1(0+1)	
2.	VAC-121	Environmental Studies and Disaster Management	3(2+1)	--
3.	SWCE-121	Surveying and Leveling	3(1+2)	--
4.	FMPE-121	Workshop Technology and Practice	2(0+2)	--
5.	FMPE-122	Engineering Drawing	2(0+2)	--
6.	COMP-122	Computer Programming and Data Structures	2(0+2)	--
7.	SEC-121	Skill Enhancement Course-I# (To be offered from the list of SEC Courses)	4(0+4)	
8.	SEC-122	Skill Enhancement Course-II# (To be offered from the list of SEC Courses)	4(0+4)	
		Total Credits Hrs.	**21(3+18) G**	
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Post-II Semester (Only for Exit option for award of UG-Certificate)				
9.	INT-121	Internship (10 Weeks)	10(0+10)	--
Semester III				
Sr. No.	**Course No.**	**Course Title**	**Credit Hours**	**Remark**
1.	MATH-232	Engineering Mathematics I	3(3+0)	
2.	PHY-231	Engineering Physics	3(2+1)	

3.	REE-232	Engineering Chemistry	3(2+1)	
4.	FS-231	Engineering Mechanics	3(2+1)	
5.	SWCE-232	Soil Mechanics	2(1+1)	
6.	IDE-231	Fluid Mechanics and Open Channel Hydraulics	3(2+1)	
7.	PFE-231	Engineering Properties of Agricultural Produce and Food Science	3(2+1)	
8.	FMPE-233	Farm Machinery & Equipment- I	3(2+1)	
9.	AEC-234	Physical Education, First Aid and Yoga Practice	2(0+2)	
		Total Credits Hrs.	**25(16+9)**	
10.	OC-231	Online Courses/ MOOCs	2(0+2)	OC/NG/NAC
Semester IV				
Sr.No.	**Course No.**	**Course Title**	**Credit Hours**	**Remark**
1.	MATH-243	Engineering Mathematics-II	3(3+0)	
2.	FS-242	Theory of Structures	2(1+1)	
3.	FS-243	Building Construction & Cost Estimation	2(2+0)	…1+1 proposed
4.	SWCE-243	Watershed Hydrology	3(2+1)	
5.	SWCE-244	Soil and Water Conservation Engineering	4(3+1)	Proposed 2 courses
6.	FMPE-244	Farm Machinery & Equipment II	3(2+1)	
7.	REE-243	Renewable Energy Sources	3(2+1)	
8.	PFE-242	Post-harvest Engineering of Cereals, Pulses and Oilseeds	3(2+1)	
9.	AEC-235/ AEC 246	Entrepreneurship Development and Business Management	3(2+1)	
		Total Credits Hrs.	**26(19+7)**	
10.	OC-242	Online Courses/ MOOCs	2(0+2)	OC/NG/NAC
Post-IV Semester (Only for Exit option for award of UG-Diploma)				
11.	INT-242	Internship (10 Weeks)	10(0+10)	--
Semester V				
Sr. No.	**Course No.**	**Course Title**	**Credit Hours**	**Remark**
1.	FS-354	Strength of Materials	2(1+1)	
2.	FMPE-355	Theory of Machines	2(2+0)	
3.	PFE-353	Thermodynamics and Heat Transfer	3(3+0)	
4.	FMPE-356	Tractor & Automotive Engines	3(2+1)	
5.	IDE-352	Irrigation and Drainage Engineering	4(3+1)	
6.	PFE-354	Food and Dairy Engineering	4(3+1)	
7.	AEC 123 /AEC 356	Personality Development	2(1+1)	
8.	GAE -352	Seminar	1(0+1)	
9.	GAE -353	Study tour	2(0+2) NG	
		Total Credits Hrs.	**21(15+6) +2 (NG)**	
10.	OC-353	Online Courses/ MOOCs	2(0+2)	OC/NG/NAC
Semester VI				
Sr.No.	**Course No.**	**Course Title**	**Credit Hours**	**Remark**
1.	FMPE-367	Tractor Systems & Controls	3(2+1)	

2.	IDE-363	Groundwater, Wells and Pumps	3(2+1)	
3.	COMP-363	Sensors, AI and Robotics in Agriculture	3(2+1)	
4.	FS-365	Agricultural Structures & Environment Control	3(2+1)	
5.	REE-364	Bioenergy Systems: Design and Applications	3(2+1)	
6.	PFE-365	Refrigeration and Air-conditioning	3(2+1)	
7.	PFE-366	Post-harvest Engineering of Horticultural Crops	2(1+1)	
8.	GAE -364	Case Study	1(0+1)	
		Total Credits Hrs.	**21(13+8)**	
Semester VII				
Sr.No.	**Course No.**	**Course Title**	**Credit Hours**	**Remark**
1.	SEC-473	Project- I	3(0+3)	
2.	FMPE- 478	Engineering Graphics and Design	2(0+2)	
3.	PFE-477	Food Quality and Safety	3(2+1)	
4.	SWCE-474	Watershed Planning and Management	3(2+1)	
5.	IDE-474	Sprinkler & Micro Irrigation Systems	2(1+1)	
6.	FMPE-479	Machine Design	2(2+0)	
7.	REE-475	Electrical Machines	3(2+1)	
8.	STAT-471	Agricultural Statistics and Data Analysis	2(1+1)	
		Total Credits Hrs.	**20 (10+10)**	
Semester VIII				
Sr.No.	**Course No.**	**Course Title**	**Credit Hours**	**Remark**
1.	SEC-484	Project -II	4(0+4)	
2.	INT-483	In-plant Training/ Research Internship	8(0+8)	
3.	ELE-481	Elective- I	3(2+1)	Any 3 can be selected from following Elective list
4.	ELE-482	Elective- II	3(2+1)	
5.	ELE-483	Elective- III	3(2+1)	
		Total Credits Hrs.	**21 (6+15)**	
		TOTAL	**175 (95+80)**	
		***Online courses**	**6**	
		Grand Total	**175+6***	

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DEPARTMENT WISE SKILL ENHANCEMENT COURSES

1. Department of Farm Machinery and Power Engineering

Sr. No.	Course No.	Title of course	Credits
1	SEC-121	Operation & maintenance of farm machinery	4 (0+4)

2	SEC-122	Repair and maintenance of tractors and power tillers	4 (0+4)
3	SEC-123	Management of agricultural machinery custom hiring and maintenance facilities	4 (0+4)
4	SEC-124	Operation and maintenance of drones used for agricultural applications	4 (0+4)
5	SEC-125	Course Number reserve for future addition	
6	SEC-126	Course Number reserve for future addition	

2. Department of Renewable Energy Engineering

Sr. No.	Course No.	Title of course	Credits
1	SEC-127	Fabrication, operation & maintenance of renewable energy devices	4 (0+4)
2	SEC-128	Machine vision, sensors and sensors architecture	4 (0+4)
3	SEC-129	Design of solar PV system using software's	4 (0+4)
4	SEC-1210	Installation and maintenance of on-grid and off-grid solar systems	4 (0+4)
5	SEC-1211	Design and maintenance of agri-voltaic systems	4 (0+4)
6	SEC-1212	Valorization of agri-biomass and organic waste	4 (0+4)
7	SEC-1213	Energy audit, energy conservation and energy efficiency	4 (0+4)

3. Department of Irrigation and Drainage Engineering

Sr. No.	Course No.	Title of course	Credits
1	SEC-1214	Repair and maintenance of pumps and irrigation systems	4 (0+4)
2	SEC-1215	Installation and maintenance of micro-irrigation systems	4 (0+4)
3	SEC-1216	Geophysical survey and investigations for groundwater exploration and installation of tube well/ bore well	4 (0+4)

4	SEC-1217	Course Number reserve for future addition	4 (0+4)
5	SEC-1218	Course Number reserve for future addition	4 (0+4)

4. Department of Soil and Water Conservation Engineering

Sr. No.	Course No.	Title of course	Credits
1	SEC-1219	Application of remote sensing and GIS for agricultural water management	4 (0+4)
2	SEC-1220	Operation and maintenance of hydro-meteorological instruments	4 (0+4)
3	SEC-1221	Installation and maintenance of roof top rain water harvesting systems	4 (0+4)
4	SEC-1222	Operation and maintenance of soil conservation structures	4 (0+4)
5	SEC-1223	Course Number reserve for future addition	4 (0+4)
6	SEC-1224	Course Number reserve for future addition	4 (0+4)

5. Department of Farm Structural Engineering

Sr. No.	Course No.	Title of course	Credits
1	SEC-1225	Construction, management and maintenance of protected cultivation structures	4 (0+4)
2	SEC-1226	Maintenance of Hydroponic Structures	4 (0+4)
3	SEC-1227	Use of IoT in Agricultural Structures	4 (0+4)
4	SEC-1228	Installation, Repair and Maintenance of Shade net houses	4 (0+4)
5	SEC-1229	Maintenance of Aeroponics Structures	4 (0+4)

6	SEC-1230	Role of bamboo in agricultural structures, value addition through product diversification and waste utilization	4 (0+4)
7	SEC-1231	Manufacturing of cement blocks and stone waste utilization	4 (0+4)
8	SEC-1232	Testing of Engineering Materials	4 (0+4)
9	SEC-1233	Estimating and Costing of Agricultural Structures	4 (0+4)

6. Department of Process Food Engineering

Sr. No.	Course No.	Title of course	Credits
1	SEC- 1234	Agro processing methods, equipment operation and maintenance	4 (0+4)
2	SEC-1235	Operation and management of multi-commodity agro-processing centre	4 (0+4)
3	SEC-1236	Primary processing and value addition and cold chain logistics	4 (0+4)
4	SEC-1237	Food grain godown and warehouse management	4 (0+4)
5	SEC-1238	Post-harvest value chain management including logistics	4 (0+4)

ELECTIVE COURSES – B.Tech. (Agril. Engg.)

S.N.	Title of Course	Credits	Deptt. Name
1	Mechanics of Tillage and Traction	3 (2+1)	FMPE
2	Farm Machinery Design and Production	3 (2+1)	FMPE
3	Tractor Design and Testing	3 (2+1)	FMPE
4	Hydraulic Drives and Controls	3 (2+1)	FMPE
5	Human Engineering and Safety	3 (2+1)	FMPE
6	Precision Agriculture and System Management	3 (2+1)	FS
7	Photovoltaic Technology and Systems	3 (2+1)	REE
8	Wind Power Technology and Systems	3 (2+1)	REE
9	Waste and By-products Utilization	3 (2+1)	REE

10	Floods and Control Measures	3 (2+1)	SWCE
11	Remote Sensing and GIS Applications	3 (2+1)	SWCE
12	Information Technology for Land and Water Management	3 (2+1)	SWCE
13	Wasteland Development	3 (2+1)	SWCE
14	Minor Irrigation and Command Area Development	3 (2+1)	IDE
15	Management of Canal Irrigation System	3 (2+1)	IDE
16	Water Quality and Management Measures	3 (2+1)	IDE
17	Landscape Irrigation Design and Management	3 (2+1)	IDE
18	Application of Plastics in Agriculture	3 (2+1)	SWCE/APE/FS
19	Precision Farming Techniques for Protected Cultivation	3 (2+1)	FS
20	Environmental Engineering	3 (2+1)	FS
21	Development of Processed Food Products	3 (2+1)	APE
22	Food Packaging Technology	3 (2+1)	APE
23	Food Plant and Equipment Design	3 (2+1)	APE
24	Emerging Technologies in Food Processing	3 (3+0)	APE
25	Processing of Livestock, Fish and Marine Products	3 (2+1)	APE
26	Food Business Management and Entrepreneurship Development	3(3+0)	APE
27	MATLAB Programming	3(1+2)	COMP
28	Python Programming	3(1+2)	COMP
29	Artificial Intelligence	3(2+1)	COMP/FMPE
30	Advances in Automation and Robotics in Agriculture	3 (2+1)	COMP/FMPE
31	Machine Learning	3(2+1)	COMP
32	Operations Research	3(3+0)	FS
33	Mechatronics	3 (2+1)	FMP
34	Natural Fibres: Extraction & Properties	3 (2+1)	APE
35	Natural Fibre : Applications in Agriculture	3 (2+1)	APE
36	Processing of Natural Fibres	3 (2+1)	APE

37	Agricultural Marketing and Trade	3 (2+1)	ECONOMICS