DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to Anna University, Chennai)

PERAMBALUR-621212

REGULATIONS–2023

CHOICE BASED CREDIT SYSTEM

B.Tech. AGRICULTURAL ENGINEERING

CURRICULUM& SYLLABI

DEPARTMENT OF AGRICULTURAL ENGINEERING

(Applicable to students admitted from the Academic year 2023 – 2024 and subsequently under Choice Based Credit System)

Discussed in BOS meeting Dated: 12.04.2023/ Agri Ratified & Approved in Academic Council on 02.09.2023

VISION MISSION OF THE INSTITUTUION

Vision:

An active and committed centre of advanced learning focused on research and training in the fields of Engineering, Technology and Management to serve the nation better.

Mission:

- To develop eminent scholar with a lifelong follow up of global standards by offering UG, PG and Doctoral Programmes.
- To pursue Professional and Career growth by collaborating mutually beneficial partnership with industries and higher institutes of research.
- To promote sustained research and training with emphasis on human values and leadership qualities.
- To contribute solutions for the need based issues of our society by proper ways and means as dutiful citizen.

DEPARTMNET OF AGRICULTURAL ENGINEERING

About the Department

The Department of Agricultural Engineering was established in the year 2021 during which the undergraduate programme was introduced.

Under the UG programme, the total sanctioned student strength is 63. The department has highly qualified, committed and research-oriented faculty members and supported by trained technical non-teaching staff. The department enjoys the privilege of having spacious and well-equipped laboratories that provide students, the industrial environment much needed for real life training.

The department has very close interaction with many leading industries in the country and research laboratories. Guest lectures, workshops, Industrial Visits, In-plant training, seminars, symposia, in-house projects in collaboration with well-established companies and other personality development that cater to the quest of today's society as well as student professionals.

The department shares the mission and vision of the institution, in imparting highquality education to the students.

Vision:

- To become a pioneering Department of producing Outstanding Agricultural Engineers through World Class technical education, training and research.

- The Graduates are moulded to become Entrepreneurs, Industrialists, Technocrats and Scientists in the field of Agricultural Engineering..

Mission:

- To help the farming Community from present day Challenges in Agriculture through Farm Mechanization, Micro irrigation, Resource conservation of soil, water, energy, post-harvest handling and Food Processing Technologies by providing quality education along with Industrial tie.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1	To train and educate students with general knowledge and skills in agricultural water management, agricultural production process, farm machinery and farm management.
PEO 2	To prepare students for a successful agricultural engineering career integrating all aspects of engineering in agriculture.
PEO 3	To develop innovative capacity of students for increasing agricultural production with scarce water resources available.

PROGRAMOUTCOMES(POs)

PO	Graduate Attribute
PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problemanalysis**: Identify, formulate, review research literature, andanalyze complex engineering problems reaching substantiated conclusion susing first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, andenvironmentalconsiderations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Moderntoolusage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge eto assesssocietal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutionsin societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader indiverse teams, and in multi disciplinary settings.
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMSPECIFICOUTCOMES(PSOs)

PSO 1	To make expertise in design and engineering problem solving approach in agriculture with proper knowledge and skill.
PSO 2	To enhance the ability of the students to formulate solutionst oreal-world problems pertaining to sustained agricultural productivity using modern technologies.
PSO 3	To inculcate entrepreneurial skills through strong Industry-Institution linkage.

PEO's – PO's & PSO's MAPPING:

PEO	**PO**												**PSO**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
I.	X	X	-	-	-	-	-	-	-	X	-	-	X	-	-
II.	X	X	X	-	-	-	X	-	X	-	X	-	-	-	X
III.	-	--	-	-	-	X	X	-	-	X	X	-	X	X	-

DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE
(AUTONOMOUS), PERAMBALUR – 621 212
B.Tech. AGRICULTURAL ENGINEERING

REGULATIONS – 2023
CHOICE BASED CREDIT SYSTEM

SEMESTER I

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	IP3151	Induction Programme	-	-	-	-	-	0
2	U23HST11	Communicative English	HSMC	3	0	0	3	3
3	U23MAT12	Matrices and Calculus	BSC	3	1	0	4	4
4	U23PHT13	Physics for Engineers and Technologists	BSC	3	0	0	3	3
5	U23CYT14	Chemistry for Engineering and Technology	BSC	3	0	0	3	3
6	U23GET16	Engineering Graphics programming	ESC	3	0	0	3	4
7	GE3152	தமிழர்மரபு /Heritage of Tamils	HSMC	3	1	0	3	1
PRACTICAL								
8	U23BSP11	Physics and Chemistry Laboratory	BSC	0	0	4	4	2
9	U23HSP12	English Laboratory	HSMC	0	0	4	4	1
10	U23GEP14	Engineering Practices Laboratory	ESC	0	0	4	4	2

SEMESTER II

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23HST21	Professional English	HSMC	3	0	0	3	2
2	U23MAT22	Statistics and Numerical Methods	BSC	3	1	0	4	4
3	U23GET15	Problem Solving and Python Programming	ESC	3	0	0	3	3
4	U23AGT21	Principle and Practices of Crop Production	PCC	3	0	0	3	3
5	U23EIT25	Basic Electrical, Electronics and Instrumentations Engineering	ESC	3	0	0	3	3
6		NCC Credit Course Level 1	-	-	-	-	-	2*
7	GE3252	தமிழரும்தொழில்நுட்பமும் / Tamils and Technology	HSMC	3	1	0	3	1
PRACTICAL								
8	U23EIP24	Basic Electrical, Electronics and, Instrumentation Engineering Laboratory	ESC	0	0	4	4	2
9	U23HSP22	Communication Laboratory	EEC	0	0	4	4	2
10	U23GEP13	Problem Solving and Python Programming Laboratory	ESC	0	0	4	4	2

SEMESTER III

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MAT31	Transforms and Partial Differential Equations	BSC	3	1	0	4	4
2	U23AGT31	Principles of Soil Science and Engineering	PCC	3	0	0	3	3
3	U23AGT32	Unit Operations in Agricultural Processing	PCC	3	0	0	3	3
4	U23AGT33	Fluid Mechanics and Open Channel Hydraulics	PCC	3	0	0	3	3
5	U23AGT34	Theory of Machines	PCC	3	0	0	3	3
6	U23AGT35	Surveying and Levelling	PCC	3	0	0	3	3
PRACTICAL								
7	U23AGP31	Soil Science Laboratory	PCC	0	0	4	4	2
8	U23AGP32	Fluid Mechanics Laboratory	PCC	0	0	4	4	2
9	U23AGP33	Surveying and Levelling Laboratory	PCC	0	0	4	4	2

SEMESTER IV

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23AGT41	Tractors and Engine Systems	PCC	3	0	0	3	3
2	U23AGT42	Soil and Water Conservation Engineering	PCC	3	0	0	3	3
3	U23AGT43	Strength of Materials for Agricultural Engineering	PCC	3	0	0	3	3
4	U23AGT44	Hydrology and Water Resources Engineering	PCC	3	0	0	3	3
5	U23MET31	Engineering Thermodynamics	PCC	3	0	0	3	3
6	U23AGT45	Agricultural Economics and Farm Management	PCC	3	0	0	3	3
PRACTICAL								
7	U23AGP41	Tractors and Farm Engines Laboratory	PCC	0	0	4	4	1
8	U23AGP42	Strength of Materials Laboratory	PCC	0	0	4	4	2

SEMESTER V

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23AGT51	Farm Machinery & Equipments	PCC	3	0	0	3	3
2	U23AGT52	Pumps Engineering	PCC	3	0	0	3	3
3	U23AGT53	Post-Harvest Technology	PCC	3	0	0	3	3
4		**Professional Elective - I**	PEC	3	0	0	3	3
5		**Professional Elective - II**	PEC	3	0	0	3	3
6	U23GET41	**Environmental Sciences and Sustainability**	BSC	3	0	0	3	2
7		**Mandatory Course-I**	-	1	0	0	1	0
PRACTICAL								
8	U23AGP51	Post-Harvest Engineering Laboratory	PCC	0	0	4	4	1
9	U23AGP52	Farm Machinery Laboratory	PCC	0	0	4	4	2
10	U23AGP53	Village Accumulation (3weeks)	EEC	0	0	2	0	1

SEMESTER VI

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23AGT61	Irrigation and Drainage Engineering	PCC	3	0	0	3	3
2	U23AGT62	IOT in Agricultural Engineering	PCC	3	0	0	3	3
3		Human Values and Ethics	HSMC	3	0	0	3	2
4	U23AGT63	Renewable Energy in Agricultural Engineering	PCC	3	0	0	3	3
5		**Professional Elective - III**	PEC	3	0	0	3	3
6		**Professional Elective - IV**	PEC	3	0	0	3	3
PRACTICAL								
8	U23AGP61	Irrigation Field Laboratory	PCC	0	0	4	4	1
9	U23AGP62	CAD for Agricultural Engineering	PCC	0	0	4	4	2
10	U23AGP63	Renewable Energy in Agricultural Engineering Laboratory	PCC	0	0	4	4	2

SEMESTER VII

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23AGT71	Remote Sensing and Geographical Information System	PCC	3	0	0	3	3
2		**Professional Elective - V**	PEC	3	0	0	3	3
3		**Open Elective I**	OEC	3	0	0	3	3
4		**Open Elective II**	OEC	3	0	0	3	3
5		**Open Elective III**	OEC	3	0	0	3	3
6		**Mandatory Course-II**	-	1	0	0	1	0
PRACTICAL								
7	U23AGP71	GIS Laboratory for Agricultural Engineers	PCC	0	0	4	4	2
8	U23AGP72	ICT in Agricultural Engineering Laboratory	PCC	0	0	4	4	2

SEMESTER VIII

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1		**Professional Elective - VI**	PEC	**3**	**0**	**0**	3	3
2		**Professional Elective - VII**	PEC	**3**	**0**	**0**	3	3
PRACTICAL								
3	U23AGP81	Project Work/Internship	EEC	0	0	12	12	6

VERTICALS – I (PRECISION FARMING AND CLIMATE)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23AGV11	IT in Agricultural System	PEC	3	0	0	3	3
2	U23AGV12	Precision Farming Techniques for Protected Cultivation	PEC	3	0	0	3	3
3	U23AGV13	Sustainable Agriculture and Farm Management	PEC	3	0	0	3	3
4	U23AGV14	Automation in Agriculture Engineering	PEC	3	0	0	3	3
5	U23AGV15	Geo-informatics for Precision farming	PEC	3	0	0	3	3
6	U23AGV16	Climate Change and Adoption	PEC	3	0	0	3	3
7	U23AGV17	Fundamentals of Agro Metrology	PEC	3	0	0	3	3

VERTICALS – II (BIO-ENERGY, BUSINESS MANAGEMENT AND EXTENSION IN AGRICULTURE)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23AGV21	Solar and Wind Energy System	PEC	3	0	0	3	3
2	U23AGV22	Fundamentals of Agriculture Extension	PEC	3	0	0	3	3
3	U23AGV23	Agriculture Waste Management	PEC	3	0	0	3	3
4	U23AGV24	Agriculture Business Mangement	PEC	3	0	0	3	3
5	U23AGV25	Principles of Mnagement for Agriculture Engineer	PEC	3	0	0	3	3
6	U23AGV26	Biomass Conversion Techniques	PEC	3	0	0	3	3
7	U23AGV27	Waste & By-Product Utilization	PEC	3	0	0	3	3

VERTICALS – III (FARM EQUIPMENTS AND SAFETY MEASURES)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23AGV31	Mechanics of Tillage and Traction	PEC	3	0	0	3	3
2	U23AGV32	Special Farm Equipment	PEC	3	0	0	3	3
3	U23AGV33	Tractor and Automative Engines	PEC	3	0	0	3	3
4	U23AGV34	Testing and Evaluation of Farm Machinery and Equipment	PEC	3	0	0	3	3
5	U23AGV35	Farm power and machinery management	PEC	3	0	0	3	3
6	U23AGV36	Human engineering and safety in farm machinery operations	PEC	3	0	0	3	3
7	U23AGV37	Energy auditing and management	PEC	3	0	0	3	3

VERTICALS – IV (FOOD PROCESSING AND DESIGN)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23AGV41	Dairy and Food Engineering	PEC	3	0	0	3	3
2	U23AGV42	Refrigeration and Cold Storage for Agriculture Engineering	PEC	3	0	0	3	3
3	U23AGV43	Post-Harvest Engineering of Horticultural Crops	PEC	3	0	0	3	3
4	U23AGV44	Packaging and Storage TechnologyFor Agricultural commodities	PEC	3	0	0	3	3
5	U23AGV45	Food Process Equipment and Design	PEC	3	0	0	3	3
6	U23AGV46	Food Plant Design & Management	PEC	3	0	0	3	3
7	U23AGV47	Novel Technologies in Food Processing	PEC	3	0	0	3	3

VERTICALS – V (SOIL AND WATER CONSERVATION)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23AGV51	Ground Water And Well Engineering	PEC	3	0	0	3	3
2	U23AGV52	Integrated Water Resource Management	PEC	3	0	0	3	3
3	U23AGV53	Irrigation Drawings	PEC	3	0	0	3	3
4	U23AGV54	Sprinkler And Micro Irrigation Systems	PEC	3	0	0	3	3
5	U23AGV55	Watershed Management	PEC	3	0	0	3	3
6	U23AGV56	Water Shed Hydrology	PEC	3	0	0	3	3
7	U23AGV57	Water Harvesting structures	PEC	3	0	0	3	3

OPEN ELECTIVE-I

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23AGO11	Air Pollution and Control Engineering	OEC	3	0	0	3	3
2	U23AGO12	Sustainable Agriculture and Food Security	OEC	3	0	0	3	3
3	U23AGO13	Seed Technology Applications	OEC	3	0	0	3	3
4	U23AGO14	Climate Change and its impact	OEC	3	0	0	3	3
5	U23AGO15	Intellectual Property Right	OEC	3	0	0	3	3

OPEN ELECTIVE-II

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23AGO21	Introduction to Food Processing	OEC	3	0	0	3	3
2	U23AGO22	Principles of Food Preservation	OEC	3	0	0	3	3
3	U23AGO23	Renewable Energy Sources	OEC	3	0	0	3	3
4	U23AGO24	Remote Sensing Concepts	OEC	3	0	0	3	3
5	U23AGO25	Industrial Nanotechnology	OEC	3	0	0	3	3

OPEN ELECTIVE-III

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23AGO31	Fundamentals of Food Engineering	OEC	3	0	0	3	3
2	U23AGO32	Basics of Integrated Water Resources Management	OEC	3	0	0	3	3
3	U23AGO33		OEC	3	0	0	3	3
4	U23AGO34	IoT Concepts and Applications	OEC	3	0	0	3	3
5	U23AGO35	Systems Analysis and Soft Computing in Agricultural Engineering	OEC	3	0	0	3	3

SUMMARY

SL. NO.	Subject Area	Credits per semester (DSEC)								Credits Total	Percentage %
		I	II	III	IV	V	VI	VII	VIII		
1	Humanities and Social Sciences	5	3				2	3		13	**7.88**
2	Basic Sciences	12	4	4		2				22	**13.13**
3	Engineering Sciences	6	10							16	**9.70**
4	Professional Core		3	21	21	12	13	7		77	**46.67**
5	Professional Elective					6	6	3	6	21	**12.73**
6	Open Elective							6		6	**3.64**
7	Employability Enhancement Courses		2			1	1		6	10	**6.06**
	Total	**23**	**22**	**25**	**21**	**21**	**22**	**19**	**12**	**165**	**100**