TEACHING PLAN: FARM POWER AND MACHINERY

SCHOOL: SOAS		ACADEMIC SESSION: 2023 – 2024		FOR STUDENT'S BATCH: 2022-2026	
1	Course Code	AEN-201			
2	Course Title	FARM MACHINERY AND POWER			
3	Credits	2 (1+1)			
4	Learning Hours	Contact Hours: 48; Assessment: 24; Guided Study: 28; Total hours: 100			
5	Course Objective	1. To enable the students to understand the basic principles of farm power. 2. To enable the students to understand the parts internal combustion engine. 3. To enable the students to understand the different tillage, sowing, intercultural, plant protection equipment. 4. To enable the students to understand the working principles of threshers, harvesting of field and horticultural crops.			
6	Course Outcomes	After the completion of this course the student will be able to understand the following points: 1. To understand the working principle of different systems and parts of internal combustion engines. 2. To equip the students with technical knowledge and skills required for the operation of Tillage, Sowing and intercultural. 3. To enable the plant protection machinery needed for agricultural farms. 4. To train the students with skills required for the operation, maintenance and evaluation of harvesting, threshing machinery needed for agricultural farms.			
7	Outline Syllabus:				
7.01	Paper Code	Unit		Reference Number	Teaching Methods
7.02	AEN-201	UNIT-I	a) Status of Farm Power in India, Sources of Farm Power. b) I.C. engines, working principles of I Cengines, comparison of two stroke and four stroke cycle engines. Study of different components ofI.C. engine, I.C. engine terminology and solved problems. c) Familiarization with different systemsof I.C.engines Air cleaning, cooling,	ICAR Course, New Delhi PP:4-30	Lecture and ppt

			lubrication, fuel supply and hydraulic control system ofa tractor.		
		UNIT-II	a) Familiarization with Power transmission system: clutch, gear box, differential andfinal drive of a tractor. b) Tractor types, Cost analysis of tractor power and attached implement. c) Familiarization with Primary and Secondary Tillage implement.	ICAR Course, New Delhi PP:31-50	Lecture and ppt
		UNIT-III	a) Implement for hill agriculture,implement for intercultural operations. b) Familiarization with sowing and planting equipment. c) Calibration of a seed drill and solved examples.	ICAR Course, New Delhi PP:51-89	Lecture and ppt
7.03	**AEN-201**	UNIT-IV	a) Familiarization with Plant Protection equipment. b) Familiarization with harvesting and threshing equipment.	ICAR Course, New Delhi PP:90-123	Lecture and ppt

8	**Course Evaluation**	
8.1	**COURSE ASSESEMENT: 30%**	
8.1.1	**Attendance**	**5 %**
8.1.2	**Homework**	**5 %**
8.1.3	**Class Test**	**5 %**
8.1.5	**Presentation**	**5%**
8.1.6	**Any other**	**20%**
8.2	**MTE**	**10%**
8.3	**End-term examination: 50%**	
9	**Text Books & References**	
9.1	**Text book**	1. E-Course of ICAR, New Delhi
9.2	**Reference**	1. JagdiswarSahay – Elements of Agricultural Engineering 2. Surendra Singh- Farm machinery –Principles and applications, ICAR, New Delhi 3. Jain, S.C. and C.R.Rai. Farm Tractor and maintenance and repair. Standard Publishers, 1705- B, Naisarak,. Delhi- 110006 4. Ojha, T.P. and A.M.Michael, A.M. Principles of Agricultural Engineering. Vol.I. Jain brothers, 16/893, East Park Road, Karol Bagh, New Delhi -110005
9.3	**Video References**	Status of Farm Power in Indiahttps://youtu.be/qxWPmT5L6wo Sources of Farm PowerI.C. engines, working principles of I C engines I.C. engines

		https://youtu.be/UfDKb7AcTAc Working principles of I C engineshttps://youtu.be/fD7GOrF7laY Comparison of two stroke and four stroke cycle engineshttps://youtu.be/kU5G20s4ILA https://youtu.be/KFIw_zVKspQ • Study of different components of I.C. engine,https://youtu.be/LU_Zn9Z3ibU • I.C. engine terminology and solved problems • https://youtu.be/Xd5zY6auK8E Air cleaning system https://youtu.be/rcXt44LWxF0 Engine cooling system https://youtu.be/FMOh4_dbxSI Study of lubrication system https://youtu.be/mmmcj53TNic Study of fuel supply system https://youtu.be/m6-KZS19HDU

Mapping of Outcomes v. Topics

Outcome no. → Syllabus topic↓	1	2	3	4
Paper Code.Unit I (a)	✓			
Paper Code. Unit I (b)		✓		
Paper Code. Unit I (c)		✓		
Paper Code.Unit II (a)			✓	
Paper Code. Unit II(b)	✓	✓		
Paper Code. Unit II(c)		✓		

Paper Code.Unit III (a)			✓	
Paper Code. Unit III(b)	✓			
Paper Code. Unit III(c)	✓			
Paper Code.Unit IV (a)	✓		✓	✓
Paper Code. Unit IV(b)	✓		✓	✓
Paper Code. Unit IV(c)	✓		✓	✓

QUESTION BANK

DESCREPTIVE QUESTION

1. Define farm mechanization?
2. Explain in briefly about tractor and custom hiring?
3. Explain about objectives of farm mechanization and classification of farm machines
4. Explain in briefly about selection of tractor?
5. Discuss about cost calculation of farm tractor by using straight line method?
6. Distinguish benefits and limitations of farm mechanization?
7. Illustrate about materials of construction of agricultural implement?
8. What are the different sources of farm power? Explain them
9. How do use discuss about scope of farm mechanization?
10. What are the merit and demerits of source of farm power?
11. Define tillage?
12. Explain in briefly about different harrowing and harrow?
13. Explain in briefly about classification and types of tillage?
14. Solve the problem consists of a three bottom 40 cm MB plough has a working depth of 15 cm and draft is 1600 kg. field efficiency is 70% and working speed is 4 km/h. Find i) Unit draft ii) Power required iii) Actual field capacity
15. Explain in briefly about accessories of mould board plough?
16. Discuss about spring tooth harrow and spike tooth harrow?
17. Distinguish between mould board plough and disc plough with neat sketches?
18. Illustrate about advantage and disadvantages of disc plough?
19. Where do you use disc harrow? Explain about different types of disc harrow?
20. Distinguish between standard disc plough and vertical disc plough?
21. What are the functions of furrow openers in seed drill? Explain in briefly about different types of furrow openers?
22. Explain about seed cum fertilizer drill?
23. Define calibration of seed drill? Explain in briefly about calibration of seed drill?

PROJECTS/ASSIGNMENT (To be given to group of students)

1. Assignment
2. Field Visit
3. MOOC Courses