AMR/AGE/BOS/2024-25/MOM/1 Date : 24-09-2024

DEPARTMENT OF ARICULTURAL ENGINEERING

MINUTES OF MEETING - BOARD OF STUDIES (BOS)

The Meeting of the Board of Studies of AGE was held on 24th September 2024 at 09.30 AM through online (Zoom Meeting Platform). The following members were attended the online meeting.

S.No	Name of the Member	Designation/occupation	category	Signature
1	Dr. D. Anand Babu	Professor Head of the Department	Chairman	
2	Dr. T. Prabhakara Rao	Assistant Professor Department of Applied Engineering, Vignan University, Vadlamudi, Guntur	University Nominee	
3	Dr. M. Madhava	Associate Dean College of Food Science & Technology, Pulivendula.	Subject experts outside parent university	
4	Dr. A. Ashok Kumar	Assistant Professor, Department of Farm Machinery & Power Engineering, Dr. N.T.R College of Agricultural Engineering, Bapatla.		
5	Mr. G. Siva Nageswara Rao	Project Manager, ILA Commodities, INDIA Pvt. Ltd	Industrialist	
6	Mr. B. Chinna Babu	Asst. Professor	Faculty Members	
7	Mrs. T. Pavani	Asst. Professor		
8	Mrs. M. Mounika	Asst. Professor		
9	Miss. SK. Dilshad	Asst. Professor		
10	Mr. N. Hanumanth Rao	Asst. Professor		
11	Mrs. D. Venkata Sandhya	Grade- M1, Service Officer, Kotak Mahendra Bank Vijayawada	Alumni Member	

P.T.O.

The Meeting began with chairman, Board of studies extending a warm welcome to all the members of participating in the meeting.

The following points were discussed and approved during the meeting

1. University Nominee Dr. T. Prabhakara Rao mainly focused on Credit separation and Credit allocation i.e for I SEM – 20.5 and for II SEM 19.5 credits to be maintained.
2. The following proposed AMR 24 Course Structure and the detailed syllabi of I-I, I-II were presented, discussed and approved.
   1. **For Group – A (CSE , EEE)**

GROUP –A – COURSES (CSE ,EEE)					
I Year – I SEM					
S.No.	**Title**	**Credits**	**S. No.**	**Title**	**Credits**
1	Communicative English	2	6	Communicative English Lab	1
2	Engineering Chemistry/Chemistry/Fundamental Chemistry	3	7	Engineering Chemistry/ Chemistry/Fundamental Chemistry Lab	1
3	Linear Algebra & Calculus	3	8	Engineering Workshop	1.5
4	Basic Civil & Mechanical Engineering	3	9	Computer Programming Lab	1.5
5	Introduction to Programming	3	10	Health and wellness, Yoga and Sports	0.5
I SEM - TOTAL CREDITS					**20.5**
I Year – II SEM					
1	Engineering Physics	3	6	IT Workshop	1
2	Differential Equations & Vector Calculus	3	7	Engineering Physics Lab	1
3	Basic Electrical and Electronics Engineering	3	8	Electrical and Electronics Engineering Workshop	1.5
4	Engineering Graphics	3	9	Data Structures Lab / Electrical Circuits Lab	1.5
5	Data Structures / Electrical Circuit Analysis – I (Branch specific)	3	10	NSS/NCC/Scouts & Guides/Community Service	0.5
II SEM - TOTAL CREDIT					**19.5**

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2. For Group –B (ECE, CE, AGE, Cyber Security)

GROUP –B – COURSES (Cyber Security ,ECE,MECH,CE, AGE)					
I Year – I SEM					
S.No.	**Title**	**Credits**	**S.No.**	**Title**	**Credits**
1	Engineering Physics	3	6	IT Workshop	1
2	Linear Algebra & Calculus	3	7	Engineering Physics Lab	1
3	Basic Electrical & Electronics Engineering	3	8	Electrical & Electronics Engineering Workshop	1.5
4	Engineering Graphics	3	9	Computer Programming Lab	1.5
5	Introduction to Programming	3	10	NSS/NCC/Scouts & Guides/Community Service	0.5
I SEM - TOTAL CREDITS					**20.5**
I Year – II SEM					
1	Communicative English	2	6	Communicative English Lab	1
2	Engineering Chemistry / Chemistry / Fundamental Chemistry	3	7	Engineering Chemistry / Chemistry /Fundamental Chemistry Lab	1
3	Differential Equations & Vector Calculus	3	8	Engineering Workshop	1.5
4	Basic Civil & Mechanical Engineering	3	9	Engineering Mechanics & Building Practices Lab Engineering Mechanics Lab / Network Analysis and Simulation Lab / Data structures Lab / **Soil Science and Agronomy Field Lab**	1.5
5	Engineering Mechanics/ Network Analysis/ Data structures / **Principles of Soil Science and Agronomy** (Branch Specific)	3	10	Health and wellness, Yoga and Sports	0.5
II SEM - TOTAL CREDITS					**19.5**

2. **Discussed and Approved the syllabus of** Principles of Soil Science and Agronomy (T) **(Annexure- 1)** , Soil Science and Agronomy Field Lab (L) **(Annexure- 2)** I year - II semester

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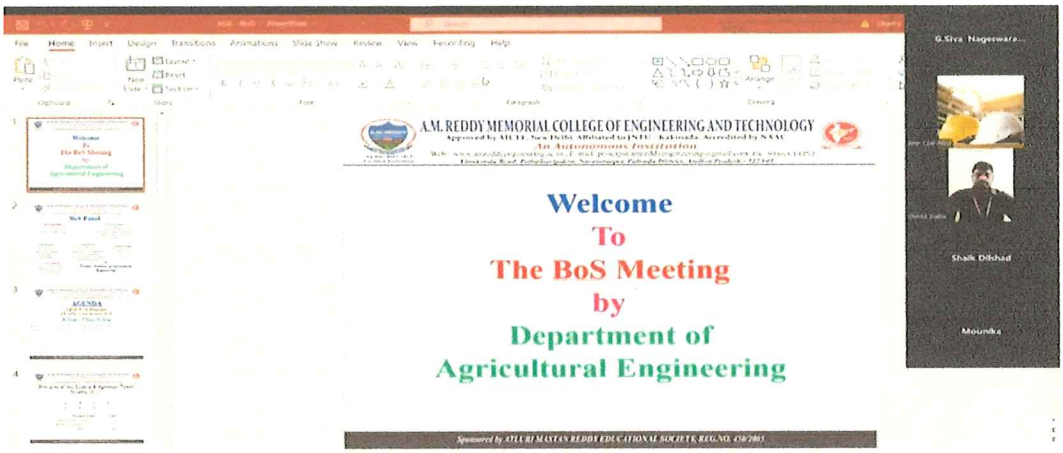
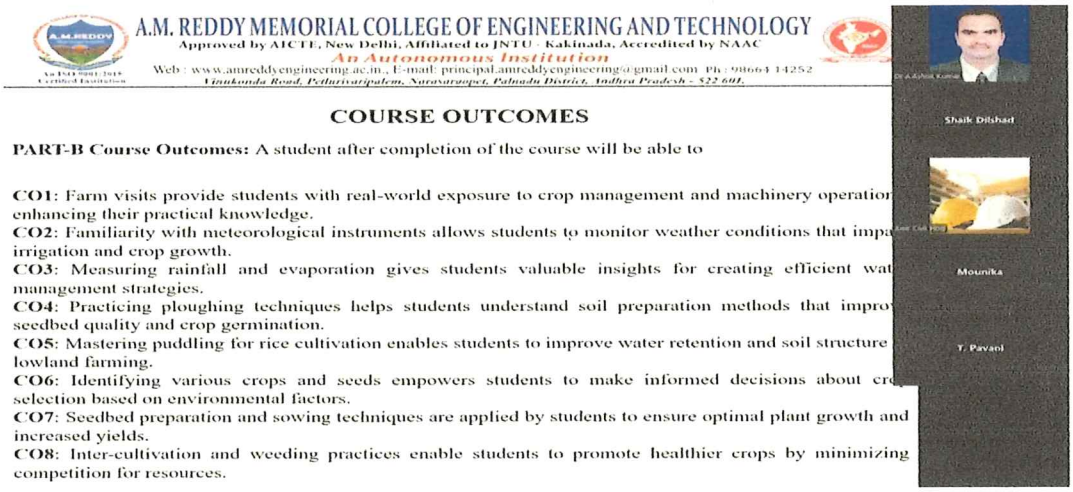
The following points were suggested for future possible implementations:

1. Suggested to prepare the course structure for all 4 years of B.Tech.
2. Suggested to mainly focus on Credit Distribution as it should reach 160 credits and In I Year I Sem it should be 20.5 credits and 19.5 credits in II Sem.





Chairman

BoS – Dept. of AGE

HEAD OF THE DEPARTMENT
AGRICULTURAL ENGINEERING
A.M. REDDY MEMORIAL COLLEGE OF ENGG & TECH
PETLURIVARIPALEM
Narasaraopet (Md.), Guntur (Dt.)

Copy to:

1. **Principal**
2. **IQAC**

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ANNEXURE – 1

AMR- 24

Principles of Soil Science & Agronomy Theory Syllabus

L	T	P	C
3	0	0	3

Course Objectives:

- To impart Knowledge on Soil genesis, properties etc.
- To enable students to design implements in related to soil, soil conservation, irrigation and drainage applications.
- Also, to enable students to understand farming principles, to grow agricultural field and orchard crop and farming practices.

Course Outcomes: A student after completion of the course will be able to

CO1: To understand soil formation, rock and mineral classification, and weathering processes for soil analysis.
CO2: To learn the factors affecting soil structure, water movement, and temperature management.
CO3: To understand soil colloids, ion exchange, and organic matter management for soil fertility.
CO4: To assess irrigation water quality and classify Indian soil groups for crop and irrigation management.
CO5: To grasp tillage practices, sowing techniques, weed management, and soil conservation in dryland farming.

UNIT – I: Introduction to Soils, Rocks, mineral, Weathering and Soil formation

Definition –soil as a three phase four component system-branches of Soil science difference between surface and sub-surface soil,

Rocks: Definition– classification of rocks based on mode of formation-igneous, sedimentary and metamorphic rocks,

Minerals: Definition,classification,primary,secondary,essential,accessory,silicate, non-silicate minerals, light and heavy minerals primary silicate minerals; quartz, feldspars-mica spyroxene samphiboles secondary silicate; secondary minerals, Ca, Mg, S and Micronutrient containing minerals-chemical formulate. Weathering:-Definition- types of weathering physical weathering of rocks, agents of physical weathering, temperature, water, wind and glaciers, Chemical weathering, solution, hydration, hydrolysis carbonation-oxidation-reduction, biological weathering role of plants and animals in weathering.

Soil formation: Soil forming factors–active and passive soil factors and their role in soil formation, Soil forming processes: Eluviation, illuviation, humification, calcification, laterization, podzolozation, salinization, alkalization and gleization, Soil Profile, Detailed description of theoretical soil profile, Soil physical properties: Soil separates and their properties. Specific surface, soil texture-definition-textural classes-methods of determination of soil texture, importance of soil structure.

UNIT - II Soil Structures

Soil structure; Definition classification based on type, class and grade, factors influencing formation of aggregates-importance and management of soil structure. Soil structure; Definition-classification based on type, class and grade factors influencing formation of aggregates-importance and management of soil structure,

Soil consistency; Definition- forms of consistency and importance of soil consistency, Bulk density and particle density; factors influencing and their importance; porosity–types-calculation- importance, Soil water; structure of water and the effect of H-bonding on properties of water retention of water in soils-soil moisture tension-soil moisture potential–soil moisture constants. Soil water movement; saturated, unsaturated and vapor flows, laws governing water flow-Darcy's and Poiseuille's law-Infiltration; Factors-importance.

Evaporation; Factors influencing evaporation- Ways to minimize it-soil mulch-organic mulch, etc., Soil air; Composition of soil air-processes of gaseous exchange –soil aeration indices –and their importance (oxygen content-ODR-aeration porosity-redox potential) management of soil air, Soil temperature; influence of soil temperature on plant growth- factors influencing soil temperature-management of soil temperature. Soil color determination importance, Soil colloids: Definition-general properties-in organic and organic colloids origin of charge on colloids (positive & negative).

UNIT III Minerals and properties, problems in soils

Secondary silicate clay minerals(in organic soil colloids) Kaolinite, Montmorillonite and Illite their structures and properties, Ion exchange, Cation and anion exchange–factors influencing ion exchange capacity of soils importance of ion exchange calculation of base saturation and exchangeable acidity, Soil organic matter: importance of organic matter CN ration of organic matter and its importance,

Soil biology;-Soil flora and fauna their characteristics role of beneficial organisms mineralization–immobilization ,nitrogen fixation, nitrification, de-nitrification, solubilization of phosphorus and sulphur,

Soil fertility:- Concepts of soil fertility and soil productivity:- definitions and differences Arnon's criteria of essentiality-essential and beneficial elements-factors influencing availability of nutrients.

Problem Soils: Definition–Physical problems soil depth slope soil crust soil compaction drainage submergence (formation-adverse effects-effect on soil properties and plant growth management), Chemical problems–classification acid, saline, saline-sodic and calcareous soils-characteristics-nutrient availability in problem soils and their reclamation.

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UNIT IV Quality of water , classification of crops and metrology

Irrigation water: Quality of irrigation water-classification based on EC, SAR, RSC and Boron content-use of saline waters in agriculture, Soil taxonomy: New comprehensive system of soil classification (7^{th} approximation) soil orders and their characteristics,

Important soil groups of India: Alluvial soils-black soils–red soils laterite soils and coastal soils. Meaning and scope of agronomy, History of agricultural development in ancient India, Agriculture in civilization era, National and International Agricultural Research Institutes in India, Classification of crops, Classification of field crops, According to Origin, Botanical Commercial, Economical, seasonal, Ontogeny, Agronomic, Lead Morphology and Special Purpose crops,

Definition of climate and weather, Definition of meteorology, Climatology, Agri-meteorology, Introduction, scope and practical utility of Agricultural meteorology, composition and structure of atmosphere.

Influence of weather on crop grain development, essential Resources for crop production, factors influencing plant growth, Biotic and A biotic factors, Crop seasons, Kharif, Rabi and summer seasons in A.P.-Agro-climatic zones of A.P. and India.

UNIT V Tillage, sowing and Basic-plant water relationship

Tillage and tilth, Objective of tillage, characteristic of good seed bed, effect of tillage on soil properties (Pore space, texture, structure, bulk density, color of the soil).

Types of Tillage, preparatory cultivation, inter cultivation, after cultivation and preparatory cultivation for lowland rice pudding, implement used for seed bed preparation, sowing, inter-cultivation and special operation,

Sowing, Methods of sowing, time and depth of sowing of major agricultural crops, Methods and time of application of manure and fertilizers.

Weeds-Influence of weeds on crop production, principles and practices of weed management, Basics on soil plant-water relationship, Types of Soil Erosion, Factors influencing soil erosion, Soil conservation, erosion preventive measures, Agronomic measures for soil and water conservation, Dry land Agriculture.

Problems of Crop production in dry farming, Agronomic measure in reducing evapo-transpiration losses, Watershed management, aims and Objectives, Organic farming-Sustainable Agriculture, Definition, Principles and importance

TEXT BOOKS:

- Principles of Agronomy, T Yellam and A Reddy & G.H. Shankar Reddy, Kalyani Publishers.
- Nature and Properties of soils. Brady NyleCand Ray R Well 2002. Pearson Education Inc., New Delhi.
- Fundamental of Soil Science. Indian Society of Soil Science 1988. IARI, NewDelhi.

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. D.V. Sandhya

Reference Books:

- Meteorology, William L Donn,1965, McGraw-Hill Book.Co. New York.
- Crop Production in Dry Regions, Arnon L1972, Leonard Hill Publishing Co., London.
- Manures and Fertilizers, Yawalkar K S and Agrawal J P,1977, Agricultural Horticultural Publishing House, Nagpur.
- Principle of Weed Science, Rao VS, 1992, Oxford and IBH Publishing Co. Ltd., New Delhi.
- Soil Fertility and Fertilizers, Tisdale S L, Nelson W L, Beaton J D and Havlin J L 1995.Prentice-Hall of India, New Delhi.
- Introduction to Soil Physics, Hillel D 1982. Academic Press, London.

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. D.V. Sandhya

ANNEXURE – 2

AMR- 24

Soil Science And Agronomy Field Lab

L	T	P	C
0	0	3	1.5

Course Objectives:

- To impose the knowledge of student on soil genesis, soil farming process structure, soil organic matte and chemical operation, etc.
- It is helpful to the student to design farm implement in relation to soil and to maintain in soil health.
- It is fine to the students to know the analysis to irrigation water, based on quality suitable crops will be selected.
- To enable the students to grow suitable agricultural crops and orchard crops and all farming practices.
- To understand the soil, crop and machine specific parameters for design and development to forms machinery equipment & implements.
- Students will be acquainted with seed processing equipment, soil and water engineering activating for efficient water and land producing and upcoming organic farming activity.

PART-A

Course Outcomes: A student after completion of the course will be able to

CO1: Through soil profile analysis, students enhance their understanding of soil layers, aiding in better agricultural planning.

CO2: Gaining proficiency in measuring bulk and particle density, students learn to assess the impact of soil compaction on crop growth.

CO3: Practical experience in determining soil texture allows students to evaluate water retention and drainage capacity for different crops.

CO4: The ability to calculate Proctor moisture content equips students to understand the effects of soil compaction in farming.

CO5: Measuring soil moisture at various tensions will enable students to design efficient irrigation systems for water conservation.

CO6: By determining hydraulic conductivity, students gain insights into water movement in soils, crucial for designing drainage systems.

CO7: Understanding soil infiltration rates empowers students to develop better irrigation techniques and prevent soil erosion.

CO8: Analyzing soil pH and electrical conductivity helps students manage saline and alkaline soils to improve crop yields.

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2. 5. 8. 11.
3. 6. 9.

PART-B

Course Outcomes: A student after completion of the course will be able to

CO1: Farm visits provide students with real-world exposure to crop management and machinery operations, enhancing their practical knowledge.

CO2: Familiarity with meteorological instruments allows students to monitor weather conditions that impact irrigation and crop growth.

CO3: Measuring rainfall and evaporation gives students valuable insights for creating efficient water management strategies.

CO4: Practicing ploughing techniques helps students understand soil preparation methods that improve seedbed quality and crop germination.

CO5: Mastering puddling for rice cultivation enables students to improve water retention and soil structure in lowland farming.

CO6: Identifying various crops and seeds empowers students to make informed decisions about crop selection based on environmental factors.

CO7: Seedbed preparation and sowing techniques are applied by students to ensure optimal plant growth and increased yields.

CO8: Inter-cultivation and weeding practices enable students to promote healthier crops by minimizing competition for resources.

List of Experiments

PART-A

Choose any six labs

1. Study of soil profile and collection of soil samples
2. Determination of bulk density and particle density of soils
3. Determination of soil texture
4. Determination of Proctor moisture content
5. Determination of soil moisture at different tensions
6. Determination of hydraulic conductivity of soil
7. Determination of infiltration rate soil
8. Determination of soil strength and soil colour
9. Determination of pH and, Electrical Conductivity(EC) of soils
10. Determination of organic carbon content in soils
11. Estimation of available Phosphorus (P) & Potassium(K) of soils
12. Determination of anions and cations in irrigation water