Swami Ramanand Teerth Marathwada University, Nanded

Choice Based Credit System (CBCS) Course Structure

Faculty of Science

B. Sc. First Year Syllabus

Semester Pattern effective from
June 2016

Subject: AGROCHEMICALS AND FERTILIZERS

B.Sc. First Year Pattern Subject: AGROCHEMICALS AND FERTILIZERS

Sr. No.	Semester	Paper No.	Name of the Course	Instruction Hrs/ week	Total period	Internal Evaluatio	Marks of Semester	Total Marks	Credits
1	I	CCAGF I (Section A)	Introductory Soil Science (PI))	03	45	10	40	50	2
		CCAGF I (Section B)	Agricultural Biochemistry (PII)	03	45	10	40	50	2
2	II	CCAGF II (Section A)	Soil Science (PIII)	03	45	10	40	50	2
		CCAGF II (Section B)	Food and Nutrition (PIV)	03	45	10	40	50	2
		CCAGFP I [CCAGF I & II (Section A & B)]	Practical's based on Section A & Section B of CCAGF I & CCAGF II (PV)	04	20 Practical	20	80	100	4
									12

The syllabus is based on six (3x2) theory periods and 4 practical periods per batch per week. Candidates should require to pass separately in theory and practical examination.

Marks distribution:

1) Theory exam: 40 marks (30+10 for each paper)

2) Internal evaluation: 10 marks (Test or Assignment & attendance)

B. Sc. First year (Semester - I)

Semester Pattern effective from -2016

Subject: AGROCHEMICALS AND FERTILIZERS

CCAGF I (Section A)

INTRODUCTORY SOIL SCIENCE (P-I)

Credits: 02 (Marks: 50) **Periods: 45**

UNIT-I

1. Soil forming Rocks and Minerals: **12**

Definition of soil, definition, classification and properties of rocks and minerals.
Weathering: Definition and types, factors responsible for weathering.

Unit-II

2. Soil profile: **08**

Definition, soil horizons and typical diagram of soil profile. Soil components.

UNIT-III

3. Soil physical properties and their importance in soil fertility: **13**

1. Soil texture and mechanical analysis of soil.
2. Soil structure.
3. Soil density and porosity.
4. Soil color.
5. Soil temperature
6. Soil aeration.

Unit-IV

4. Soil fertility and productivity: **12**

Definition, comparison between fertility and productivity and factors affecting them

Management of soil productivity

CCAGF I (Section B)

AGRICULTURAL BIOCHEMISTRY (P-II)

Credits: 02 (Marks: 50) **Periods: 45**

UNIT-I

1. Scope and Importance of biochemistry in Agriculture **02**

2. Carbohydrates: **09**

Definition, classification, structure and properties of Glucose, biological significance of carbohydrates,

Unit-II

3. Amino acids and Proteins: **10**

Amino acids: Definition, structure, classification and properties of amino acids.

Proteins: Introduction, definition, classification, properties and structure of proteins. Qualitative tests for identification of proteins.

UNIT-III

4. Lipids: **12**

Introduction, Definition, components of fats-alcohols and fatty acids, classification of lipids, properties of fats and oils, biological significance of lipids.

Unit-IV

5. Enzymes: **12**

Definition, classification, chemical nature of enzymes, factors affecting enzyme activity, role of enzyme as biological catalysts.

CCAGF II (Section A)

SOIL CHEMISTRY (P-III)

Credits: 02 (Marks: 50) **Periods: 45**

UNIT-I

Soil Colloids: **13**

1. Definition, types, nature, constitution, classification of collides, properties of soil colloids and their role in soil fertility.

.

Unit-II

2. **Soil water:** **08**

Importance, retention and movement of water in soil. Soil moisture constants,Loss of water in soil and plants.

UNIT-III

3. **Soil organic matter:** **10**

Sources, composition and decomposition of soil organic matter. Influence of soil organic matter. Factors affecting decomposition of organic matter.

4. **Ion exchange properties of soil:** **04**

Introduction, Importance ,cation exchange process in soil. Anion exchange.

Unit-IV

5. **Soil reaction and buffering of soil:** **05**

Definition, factors controlling soil pH. Relation of soil pH and nutrient availability. Buffer capacity of soil.

6. **Soil micro-organisms:** **05**

Important microbial process in soil.
Biological nitrogen fixation, Nitrification, ammonification, denitrification.

Reference Books: soils

1. Fundamental of soil science: Forth and Turk.
2. Principles of soil science: M. M. Rai.
3. Nature and properties of soil: Bookmann and Brady.
4. A textbook of soil science: Dr. J. A. Daji.
5. Introduction to agronomy: Vaidya and Sahastrabuddhe.
6. Soil fertility and fertilizer: Tisdle and Nelson.
7. Soil science: P. S. Varma and V. K. Agarwal.
8. Soil fertility: Theory and Practice by J. S. Kanwar.
9. Dictionary of soil and water management by J. R. Kadam, B. P. Ghildyal.
10. Handbook of agriculture: I. C. A. R. Publicatio

CCAGF II (Section B)

FOOD AND NUTRITION (P-IV)

Credits: 02 (Marks: 50) **Periods: 45**

UNIT-I

1. Nutrition:

Food –Definition ,functions of food -Physiological, social and psychological, Balanced Nutrition and malnutrition **16**

Definition, nutritional components of food, energy requirements and its importance. Nutritional importance of following food constituents.

1) Carbohydrates.
2) Proteins.
3) Fats and fatty acids.
4) Minerals and water.
5) Fibers

Unit-II

2. Vitamins: **10**

Introduction, classification, properties, functions and deficiency symptoms of vitamins. A, D, E, K, Vit. B complex (B1 & B12) and vitamin C (Ascorbic acid).

UNIT-III

3. Plant Hormones: **10**

Introduction, occurrence, Structure, Physiological role of following plant hormones.

a) Auxins
b) Gibberellins
c) Cytokinins.
d) Abscisic acid.

Applications of plant hormones in agriculture.

Unit-IV

4. a] Biochemical changes during seed germination **9**
b] Biochemical changes during fruit ripening.
c] Commercial use of hormones in fruit ripening.

Reference Books: Biochemistry

1. Foods: Facts and principle by N. Snakuntala Many and M. Shadaksharaswany.
2. Handbook of agriculture: I. C. A. R. Publications.
3. Plant physiology by Sunderam.
4. Plant biochemistry by Bonner.

5. Textbook of biochemistry by West and Todd.
6. Elementary biochemistry: by J. L. Jain, Sanjay Jain and Nitin Jain.
7. Elements of biochemistry by Srivastava.
8. Fundamentals of food and nutrition by S. R. Mudambi and M. V. Rajgopal.
9. Funadamentals of biochemistry by B. P.; Pandey.
10. Introduction to modern biochemistry by P. Carlon.
11. Plant physiology and biochemistry by Agarwal.
12. A Text book of plant physiology by N. Datta.
13. Food and nutrition by Swaminathan.

Practical Paper: CCAGF P-I (P-V)
(Annual practical Based on [CCAGF I & II (Section A & B)])

(Practical syllabus requires **four periods per batch per week)**

Credits: 04 (Marks: 100) **Periods: 20 Practicals**

1. Collection of soil sample and preparation.
2. Determination of bulk density of soil.
3. Determination of practical density of soil.
4. To determine organic carbon from soil sample.
5. To determine moisture percentage from soil.
6. Preparation of HCl extract of soil.
7. Determination of Ferrous from HCl extract.
8. Determination of Calcium from HCl extract.
9. Determination of phosphorus from HCl extract.
10. Color test of carbohydrate and protein.
11. Estimation of reducing sugar from cane juice.
12. Estimation of non-reducing sugar from Jaggary.
13. Determination of acid value from oil sample.
14. Determination of saponification value from oil sample.
15. Estimation of Vitamin C from fruit juice.
16. Visit to soil testing laboratory.
17. Visit to vermiculture industry.
18. Visit to sericulture industry.
19. Use and applications of soil thermometer.
20. Determination of water holding capacity of soil.

Reference Books:

1. Analytical agricultural chemistry by Kanwar and Chopra.
2. Soil analysis by Ravi.
3. Chemical analysis by Jackson.
4. Handbook of agriculture by I. C. A. R. Publication.
5. Textbook of agricultural biochemistry by Jain.

Faculty of Science

B. Sc. Second year Syllabus structure

Subject: AGROCHEMICALS AND FERTILIZERS

III	CCAGF III (Section A)	Plant Nutrition and Fertilizers (P-VI)	03	45	10	40	50	2
	CCAGF III (Section B)	Insecticides and Herbicides (P-VII)	03	45	10	40	50	2
	CCAGFP II [CCAGF III & IV (Section A)]	Practical's based on P-VI & P-VIII (P-X)	04	20 pract	10	40	50	2
	CCAGFP II [CCAGF III & IV (Section B)]	SEC I (1 Skill/ optional)			15×3 = 45	-	-	(02)*
IV	CCAGF IV (Section A)	Manures and Organic farming (P-VIII)	03	45	10	40	50	2
	CCAGF IV (Section B)	Plant Diseases and fungicides (P-IX)	03	45	10	40	50	2
	CCAGF P III [CCAGF III & IV (Section B)]	Practical's based on P-VII & P-IX (P-XI)	04	20practical	10	40	50	2
	CCAGFP III [CCAGF III & IV (Section B)]	SEC II (1 Skill / optional)			15×3 = 45	-	-	(02)*
Total credits semester III and IV								12(04)*

B.Sc. Third year Structure Subject: AGROCHEMICALS AND FERTILIZERS

Semester	Course No.	Name of the Course	Instruction Hrs/ week	Total period	Internal Evaluation	Marks of Semester	Total Marks	Credits
V	DECAGF I (Section A)	Agronomy and seed Technology (P-XII)	03	45	10	40	50	2
	DECAGF I [(Section B) Elective]	Horticulture (P-XIII)/Vegetable Production	03	45	10	40	50	2
	DECCAGF P I [DECAGF I & II	Practical's based on P- XII & P XIV(P-XVI)	04	20 Practical	10	40	50	2
	DECAGFP II [DECAGF	SEC III (1 Skill/ optional)			15×3 = 45	-	-	(02)*
VI	DECAGF II (Section A)	Preservation of fruits and vegetables (P-XIV)	03	45	10	40	50	2
	DECAGF II [(Section B) Elective]	Agricultural Technology/ Hydroponics Technology (P-XV)	03	45	10	40	50	2
	DECAGF P II) [DECAGF I & II	Practical's based on P- XIII & P-XIV (P-XVII)	04	20Practical	10	40	50	2
	DECAGFP II(Section B)	SEC IV (Project))			5O	-	50	(2)*
Total credits semester V and VI								12(04)*