

## AGRONOMY

**Course Code : AGR 101**

**Course Title : Principles of Agronomy**

**Credit Hours : 3(2+1)**

**Full Marks: 75 Theory: 50**

**Practical: 25**

### OBJECTIVES

Upon the completion of this course, the students will be able to explain soil and climatic factors in relation to increasing field crop productivity and the basic principles underlying the successful crop production.

### I. SYLLABUS

Overview of agriculture and agronomy, weather and climate, tillage, seed and seed quality, cropping system, soil fertility and soil productivity, soil erosion, weed management, irrigation and drainage, crop ideo-type and crop density in relation to successful field crop production.

### II. COURSE OUTLINE

#### A. Lecture

S.N.	Topic	No. of Lectures
<b>1.</b>	<b>Overview of Agriculture and Agronomy</b>	<b>3</b>
1.1	Definition of Agriculture and Agronomy, subsistence and commercial agriculture, Green Revolution.	
1.2	Relationship of Agronomy to other sciences, role of Agronomist in solving food problem and food security of Nepal.	
1.3	Classification of Agronomical crops based on growing season, Agronomic and special purpose classification.	
<b>2</b>	<b>Weather and climate</b>	<b>3</b>
2.1	Definition of weather, climate, microclimate, meteorology and agro meteorology.	
2.2	Elements of climate: Solar radiation and temperature and their effects on crop growth	
2.3	Precipitation, relative humidity and wind and their effects on crop growth	
<b>3</b>	<b>Tillage</b>	<b>3</b>
3.1	Definition, history, objective of tillage, soil tilth.	
3.2	Types and methods of tillage, primary, secondary and inter tillage.	
3.3	Conventional and conservation tillage and their advantages and disadvantages	
<b>4</b>	<b>Seed and Seed quality</b>	<b>3</b>
4.1	Definition of seed and seed technology, Characteristics of quality seed and its importance.	
4.2	Different classes of seed, seed germination and dormancy	
4.3	seed certification methods in Nepal	

<b>5.</b>	<b>The cropping system</b>	<b>2</b>
5.1	Definition of sole crop, monoculture, cropping pattern, cropping system, farming system, multiple cropping, sequence cropping, inter cropping, mixed cropping, and relay cropping.	
5.2	Definition and method to calculate cropping index, cropping intensity and land equivalent ratio. Crop rotation, principles and advantage of crop rotation.	
<b>6.</b>	<b>Soil fertility and soil productivity</b>	<b>5</b>
6.1	Soil fertility and soil productivity, criteria of essentiality of element, classification of essential elements, forms of elements used by crops.	
6.2	Manures: importance of organic manures, classification and characteristics of different manures including green manure used by Nepalese farmers.	
6.3	Fertilizers: Classification of fertilizers, Nitrogenous, Phosphatic and potassic fertilizers.	
6.4	Biofertilizers: Saprophytes, Symbiotic bacteria, Blue green algae, Azolla, Azotobacter and mycorrhiza.	
6.5	Factor affecting fertilizer use, time and methods of fertilizer applications	
<b>7.</b>	<b>Weed management</b>	<b>3</b>
7.1	Definition, losses and benefits of weeds	
7.2	Classification and management of weeds, prevention, eradication and control.	
7.3	Physical, Cultural, Biological, and chemical methods of weed control with their relative merit and demerit.	
<b>8.</b>	<b>Irrigation and drainage</b>	<b>4</b>
8.1	Role of water, Water requirement, definition and objectives of irrigation.	
8.2	Methods of irrigation: surface, Sub surface, sprinkler and drip irrigation	
8.3	Scheduling of irrigation: Soil moisture depletion approach, IW/CPE approach, Critical stage approach, and pan evaporimeter.	
8.4	Drainage: adverse effect of water logging, types of drainage.	
<b>9.</b>	<b>Soil erosion</b>	<b>2</b>
9.1	Definition of soil erosion, types of water erosion, factor affecting water erosion and losses due to water erosion, conservation practices,	
9.2	Wind erosion, types, factor affecting, losses and control of wind erosion.	
<b>10</b>	<b>Crop ideotype and crop density</b>	<b>2</b>
10.1	Ideotype concept, traits for ideotype, characteristics ideotype of rice, wheat and maize. concept of harvest index,	
10.2.	Crop density, Optimum plant population, factor affecting optimum plant population.	
<hr/> <b>Total</b>		<b>30</b>

## B. Practical

S.N.	Topic	No. of Practical
1.	Collection and identification of seeds field crops.	1
2.	Seed purity and germination test	1
3.	Seed rate calculation based on germination and purity and real value of seed.	1
4.	Field preparation and planting seasonal field crops.	1
5.	Identification and nutrient contents of common manures and fertilizers.	1
6.	Calculation of fertilizers and manures.	1
7.	Methods of fertilizer applications in field crops.	1
8.	Identification of common weeds and weed control of field crops.	1
9.	Weed collections and preparations of weed herbarium.	1
10.	Identification of herbicides and herbicide formulations.	1
11.	Calculation of herbicides for application.	1
12.	Study of cropping systems of nearby farms.	1
13.	Calculation of cropping intensity, cropping index and land equivalent ratio.	1
14.	Visit to NMRP, NGLRP and Agronomy farm of AFU.	1
15.	Yield attributes and yield estimation of seasonal field crops.	1
<b>Total</b>		<b>15</b>

## REFERENCES

- S.R. Reddy.2007.Principles of Agronomy. Kalyani Publishers. Ludhiana. Third revised edition.
- T. Y. Reddy and G.H. S. Reddi.1997. Principles of Agronomy. Kalyani Publishers. Ludhiana. Second revised edition.
- R.M. Lantican.2001. The Science and Practices of Crop Production. SEAMEO SEARCA. UPLB. Philippines Publication.
- K. P. Sharma, K.R. Dahal and K. R. Neupane.1991. An Introduction to Agronomy. IAAS, Rampur, Chitwan. Publication.