Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	AS 512	**Title of the Course**	Soil Mineralogy, Genesis, Classification and Survey	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	2	0	2	
Course Objectives	• To study about basics of crystallography and different clay minerals • To learn about soil formation and weathering of rocks and minerals • To study soil taxonomy • To study soil survey and the techniques of soil survey • 5. To study land capability classification and land irrigability classification						

Course Outcomes	
CO1	To learn crystallography and the properties of clay minerals
CO2	To learn about soil formation and weathering processes of rocks and minerals
CO3	To study the soil classification systems
CO4	To learn about the soil survey techniques
CO5	To study about the land evaluation

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Unit-I**	Fundamentals of crystallography, space lattice, coordination theory, isomorphism and polymorphism. Classification, structure, chemical composition and properties of clay minerals; genesis and transformation of crystalline and non-crystalline clay minerals; identification techniques; amorphous soil constituents and other non-crystalline silicate minerals and their identification; clay minerals in Indian soils.	5	CO1
2	**Unit-II**	Factors of soil formation, soil formation models; soil forming processes; weathering of rocks and mineral transformations; soil profile; weathering sequences of minerals with special reference to Indian soils.	5	CO2
3	**Unit-III**	Concept of soil individual; soil classification systems - historical developments and modern systems of soil classification with special emphasis on soil taxonomy; soil classification, soil mineralogy and soil maps – usefulness	5	CO3
4	**Unit-IV**	Soil survey and its types; soil survey techniques - conventional and modern; soil series – characterization and procedure for establishing soil series; benchmark soils and soil correlations; soil survey interpretations; soil mapping, thematic soil maps, cartography, mapping units, techniques for generation of soil maps.	5	CO4
5	**Unit-V**	Landform – soil relationship; major soil groups of India with special reference to respective states; land capability classification and land irrigability classification; land evaluation and land use type (LUT) – concept and application; approaches for managing soils and landscapes in the framework of agroecosystem.	5	CO5

Reference Books:

- Pedology - Concepts and Applications- Sehgal J. 2002, Kalyani.
- Clay Mineralogy- Grim RE. 1968, McGraw Hill.
- The Nature and Properties of Soils. 13th Ed.- Brady NC & Weil RR. 2002, Pearson Edu.
- Minerals in Soil Environments. 2nd Ed.- Dixon JB & Weed SB 1989, Soil Science Society of America, Madison.

e-Learning Source:

https://www.soilmanagementindia.com/soil-properties/6-main-types-of-clay-minerals/3564

https://www.soilmanagementindia.com/rocks/weathering-of-rocks-and-minerals/3456

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	1	1	1	1	2	2	1	1			3	3	2	2		
CO2	3	2	1	1	1	1	2	3	1	1			3	2	2	2		
CO3	3	2	1	1	1	1	1	1	2	2			3	3	3	2		
CO4	3	3	2	3	2	1	1	1	2	3			3	3	3	3		
CO5	3	3	2	3	2	1	1	1	2	3			3	3	3	3		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Integral University, Lucknow

Effective from Session: 2020-21							
Course Code	AA 505	**Title of the Course**	Agronomy of Major Field Crops (Kharif)	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	3	0	0	
Course Objectives	• To attain the knowledge of concept of major field crops, pulse crop, oilseed crop and cash crop						

Course Outcomes	
CO1	To learn study about the origin, history, distribution, adaptation, classification, morphology, physiology of major field crops
CO2	To learn about the adaptation, classification, morphology, physiology of major field crops
CO3	To understand the phenology, varietal improvement and production technology of major field crops
CO4	To know the quality components and industrial use of the main and by products
CO5	To understand the post-harvest handling of main and by products for marketing

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Unit-I**	Origin, history, distribution, adaptation, classification, morphology, phenology, varietal improvement and production technology of Rice Maize, Sorghum, Pearl-millet	9	CO1, CO3
2	**Unit-II**	Origin, history, distribution, adaptation, classification, morphology, phenology, varietal improvement and production technology of Smaller-millet, Pigeon pea, Mung bean, Urd bean, Cowpea, Moth bean, Groundnut, Sunflower, Sesame, Niger, Caster, Soybean, Cotton, Jute, Mesta & Sugarcane.	16	CO1, CO3
3	**Unit-III**	Quality components and industrial uses of the main and by-products and their post-harvest handling for marketing	9	CO2, CO4, CO5

Reference Books:

- Das NR. 2007. Introduction to Crops of India. Scientific Publ.
- Kumar Ranjeet & Singh NP. 2003. Maize Production in India: Golden Grain in Transition. IARI, New Delhi
- Khare D & Bhale MS. 2000. Seed Technology. Scientific Publ.
- Hunsigi G & Krishna KR. 1998. Science of Field Crop Production. Oxford & IBH.
- Pal M, Deka J & Rai RK. 1996. Fundamentals of Cereal Crop Production. Tata McGraw Hill.

e-Learning Source:

https://www.iaritoppers.com/2019/06/Field-Crop-Kharif-ICAR-E-course-Free-PDF-Book-Download-e-krishi-shiksha.html

https://ashabookhouse.com/product/agronomy-of-field-crops/

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	2	3	3	3	3	3	3	3	2			3	3	1	2		
CO2	3	2	1	2	2	2	3	2	2	3			3	3	1	2		
CO3	2	2	3	3	3	3	2	3	3	3			2	2	2	2		
CO4	3	3	2	2	2	2	1	3	2	2			3	3	2	3		
CO5	3	2	3	2	2	1	1	3	2	2			3	2	3	3		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	AS 511	**Title of the Course**	Management of Problematic Soils and Waters	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	2	0	2	
Course Objectives	• To study about the classification and characterization of salt affected soils of India, survey and mapping of problematic soils of India						

Course Outcomes	
CO1	To gain basic knowledge about the problematic soils and its factors
CO2	To provide knowledge of classification and characterization of salt affected soils of India
CO3	To imparts knowledge on reclamation and management of soil physical and chemical constraints
CO4	To study about the crop management practices in problematic soils and waters for irrigation
CO5	To deal with survey and mapping of problematic soils of India

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Unit-I**	Area and distribution of problem soils – acidic, saline, sodic and physically degraded soils; origin and basic concept of problematic soils, and factors responsible**.**	4	CO1
2	**Unit-II**	Morphological features of saline, sodic and saline-sodic soils; characterization of salt-affected soils - soluble salts, ESP, pH; physical, chemical and microbiological properties	6	CO2
3	**Unit-III**	Management of salt-affected soils; salt tolerance of crops - mechanism and ratings; monitoring of soil salinity in the field; management principles for sandy, clayey, red lateritic and dry land soils.	7	CO3
4	**Unit-IV**	Acid soils - nature of soil acidity, sources of soil acidity; effect on plant growth, lime requirement of acid soils; management of acid soils; biological sickness of soils and its management	6	CO4
5	**Unit-V**	Quality of irrigation water; management of brackish water for irrigation; salt balance under irrigation; characterization of brackish waters, area and extent; relationship in water use and quality.	7	CO4
6	**Unit-VI**	Agronomic practices in relation to problematic soils; cropping pattern for utilizing poor quality ground waters.	6	CO5
Practicals:				
Characterization of acid, acid sulfate, salt-affected and calcareous soils, Determination of cations (Na^+, K^+, Ca^{2+} and Mg^{2+}) in ground water and soil samples, Determination of anions (Cl^-, SO_4^{2-}, CO_3^{2-} and HCO_3^-) in ground waters and soil samples, Lime and gypsum requirements of acid and sodic soils.			18	CO1, CO2, CO3, CO4, CO5

Reference Books:

- Chemistry of the Soil-Bear FE. 1964, Oxford & IBH.
- Salt-affected Soils- Jurinak JJ. 1978, Department of Soil Science & Biometeorology. Utah State Univ.
- Diagnosis and improvement of Saline and Alkali Soils- USDA Handbook No. 60. 1954, Oxford & IBH.
- Fundamentals of Soil Science- Indian Society of Soil Science (ISSS) 2012, 2nd edition.

e-Learning Source:

https://www.academia.edu/44609807/Title_Management_of_Problematic_Soils_and_Water

https://coabnau.in/uploads/1631006625_UG_Ag.Chem.3.3_ProblematicSoils_THEORYNOTES.pdf

https://agritech.tnau.ac.in/pdf/3.pdf

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	2	1	1	3	3	3		3			3	3	1	2		
CO2	3	3	3	1		3	3	3		3			3	3	1	1		
CO3	3	2	1	1		2	3	3	1	1			2	2	2	1		
CO4	3	2	2	2		3	3	3		2			3	3	2	3		
CO5	3	1	1	1	1	2	3	3		2			3	2	3	2		

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Integral University, Lucknow

Effective from Session: 2018-2019							
Course Code	PGS501	**Title of the Course**	Library and Information Services	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	0	0	2	
Course Objectives	• To study about the role of library in education, research and technology • To obtain idea of Intricacies of abstracting and indexing services and to enlighten the students about the computerized library services. • To give the knowledge of e resources and search engines						

Course Outcomes	
CO1	The students will gain the knowledge about the library importance in different sites.
CO2	They gain knowledge of Intricacies of abstracting and indexing services.
CO3	They know about the computerized library services.
CO4	To provide knowledge of e resources.
CO5	To give basic information about search engines.

Practicals:

	Contact Hrs.	**Mapped CO**
Introduction to library and its services; Role of libraries in education, research and technology transfer; Classification systems and organization of library; Sources of information- Primary Sources, Secondary Sources and Tertiary Sources; Intricacies of abstracting and indexing services (Science Citation Index, Biological Abstracts, Chemical Abstracts, CABI Abstracts, etc.); Tracing information from reference sources; Literature survey; Citation techniques/Preparation of bibliography; Use of CD-ROM Databases, Online Public Access Catalogue and other computerized library services; Use of Internet including search engines and its resources; e-resources access methods.	28	CO1, CO2, CO3, CO4, CO5

Reference Books:

- Singh G. Information Sources, Services and Systems, 2013 Edition. Prentice Hall India Learning Private Limited
- Library Science, 2018 Edition. Ramesh Publishing House
- Subhankar Biswas, Durga Sankar Rath. Cataloguing in the New Era: Gazing through the Bodleian Catalogues to RDA, 2017 Edition. Ess Ess Publications

e-Learning Source:

https://www.youtube.com/watch?v=jQlGmtY3sUw (Role of libraries in education, research and technology transfer)

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	1	1	1	3	3	3	2	3			1	1	1	1		
CO2	3	3	1	3	3	3	1	3	2	3			1	1	1	2		
CO3	3	2	1	3	3	2	1	3	2	1			1	1	1	1		
CO4	3	2	1	3	3	3	1	3	2	2			1	1	1	1		
CO5	3	1	1	3	3	3	1	3	2	2			1	1	1	1		

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation