



## Integral University, Lucknow

<b>Effective from Session:</b> 2022-23							
<b>Course Code</b>	AS 512	<b>Title of the Course</b>	Soil Mineralogy, Genesis, Classification and Survey	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	II	<b>Semester</b>	III	2	0	2	
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>To study about basics of crystallography and different clay minerals</li> <li>To learn about soil formation and weathering of rocks and minerals</li> <li>To study soil taxonomy</li> <li>To study soil survey and the techniques of soil survey</li> <li>5. To study land capability classification and land irrigability classification</li> </ul>						

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

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>Unit-I</b>	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	<b>Unit-II</b>	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	<b>Unit-III</b>	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	<b>Unit-IV</b>	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	<b>Unit-V</b>	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

<b>Reference Books:</b>	
<ul style="list-style-type: none"> <li>Pedology - Concepts and Applications- Sehgal J. 2002, Kalyani.</li> <li>Clay Mineralogy- Grim RE. 1968, McGraw Hill.</li> <li>The Nature and Properties of Soils. 13th Ed.- Brady NC &amp; Weil RR. 2002, Pearson Edu.</li> <li>Minerals in Soil Environments. 2nd Ed.- Dixon JB &amp; Weed SB 1989, Soil Science Society of America, Madison.</li> </ul>	
<b>e-Learning Source:</b>	
<a href="https://www.soilmanagementindia.com/soil-properties/6-main-types-of-clay-minerals/3564">https://www.soilmanagementindia.com/soil-properties/6-main-types-of-clay-minerals/3564</a>	
<a href="https://www.soilmanagementindia.com/rocks/weathering-of-rocks-and-minerals/3456">https://www.soilmanagementindia.com/rocks/weathering-of-rocks-and-minerals/3456</a>	

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
<b>CO1</b>	3	2	1	1	1	1	2	2	1	1			3	3	2	2		
<b>CO2</b>	3	2	1	1	1	1	2	3	1	1			3	2	2	2		
<b>CO3</b>	3	2	1	1	1	1	1	1	2	2			3	3	3	2		
<b>CO4</b>	3	3	2	3	2	1	1	1	2	3			3	3	3	3		
<b>CO5</b>	3	3	2	3	2	1	1	1	2	3			3	3	3	3		

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

<b>Name &amp; Sign of Program Coordinator</b>	<b>Sign &amp; Seal of HoD</b>
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## Integral University, Lucknow

<b>Effective from Session:</b> 2020-21							
<b>Course Code</b>	AA 505	<b>Title of the Course</b>	Agronomy of Major Field Crops (Kharif)	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	II	<b>Semester</b>	III	3	0	0	
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>To attain the knowledge of concept of major field crops, pulse crop, oilseed crop and cash crop</li> </ul>						

Course Outcomes	
<b>CO1</b>	To learn study about the origin, history, distribution, adaptation, classification, morphology, physiology of major field crops
<b>CO2</b>	To learn about the adaptation, classification, morphology, physiology of major field crops
<b>CO3</b>	To understand the phenology, varietal improvement and production technology of major field crops
<b>CO4</b>	To know the quality components and industrial use of the main and by products
<b>CO5</b>	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	<b>Unit-I</b>	Origin, history, distribution, adaptation, classification, morphology, phenology, varietal improvement and production technology of Rice Maize, Sorghum, Pearl-millet	9	CO1, CO3
2	<b>Unit-II</b>	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	<b>Unit-III</b>	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:	
	<a href="https://www.iaritoppers.com/2019/06/Field-Crop-Kharif-ICAR-E-course-Free-PDF-Book-Download-e-krisi-shiksha.html">https://www.iaritoppers.com/2019/06/Field-Crop-Kharif-ICAR-E-course-Free-PDF-Book-Download-e-krisi-shiksha.html</a>
	<a href="https://ashabookhouse.com/product/agronomy-of-field-crops/">https://ashabookhouse.com/product/agronomy-of-field-crops/</a>

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
	<b>CO1</b>	2	2	3	3	3	3	3	3	3	2			3	3	1	2	
<b>CO2</b>	3	2	1	2	2	2	3	2	2	3			3	3	1	2		
<b>CO3</b>	2	2	3	3	3	3	2	3	3	3			2	2	2	2		
<b>CO4</b>	3	3	2	2	2	2	1	3	2	2			3	3	2	3		
<b>CO5</b>	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

<b>Effective from Session:</b> 2021-22							
<b>Course Code</b>	AS 511	<b>Title of the Course</b>	Management of Problematic Soils and Waters	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	II	<b>Semester</b>	III	2	0	2	
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>To study about the classification and characterization of salt affected soils of India, survey and mapping of problematic soils of India</li> </ul>						

Course Outcomes	
<b>CO1</b>	To gain basic knowledge about the problematic soils and its factors
<b>CO2</b>	To provide knowledge of classification and characterization of salt affected soils of India
<b>CO3</b>	To imparts knowledge on reclamation and management of soil physical and chemical constraints
<b>CO4</b>	To study about the crop management practices in problematic soils and waters for irrigation
<b>CO5</b>	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	<b>Unit-I</b>	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	<b>Unit-II</b>	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	<b>Unit-III</b>	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	<b>Unit-IV</b>	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	<b>Unit-V</b>	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	<b>Unit-VI</b>	Agonomic 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 <sup>+</sup> , K <sup>+</sup> , Ca <sup>2+</sup> and Mg <sup>2+</sup> ) in ground water and soil samples, Determination of anions (Cl <sup>-</sup> , SO <sub>4</sub> <sup>2-</sup> , CO <sub>3</sub> <sup>2-</sup> and HCO <sub>3</sub> <sup>-</sup> ) in ground waters and soil samples, Lime and gypsum requirements of acid and sodic soils.	18	CO1, CO2, CO3, CO4, CO5
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**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://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://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
	<b>CO1</b>	3	1	2	1	1	3	3	3		3			3	3	1	2	
<b>CO2</b>	3	3	3	1		3	3	3		3			3	3	1	1		
<b>CO3</b>	3	2	1	1		2	3	3	1	1			2	2	2	1		
<b>CO4</b>	3	2	2	2		3	3	3		2			3	3	2	3		
<b>CO5</b>	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

<b>Effective from Session:</b> 2018-2019							
<b>Course Code</b>	PGS501	<b>Title of the Course</b>	Library and Information Services	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Year</b>	II	<b>Semester</b>	III	0	0	2	
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>To study about the role of library in education, research and technology</li> <li>To obtain idea of Intricacies of abstracting and indexing services and to enlighten the students about the computerized library services.</li> <li>To give the knowledge of e resources and search engines</li> </ul>						

Course Outcomes	
<b>CO1</b>	The students will gain the knowledge about the library importance in different sites.
<b>CO2</b>	They gain knowledge of Intricacies of abstracting and indexing services.
<b>CO3</b>	They know about the computerized library services.
<b>CO4</b>	To provide knowledge of e resources.
<b>CO5</b>	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:
<ul style="list-style-type: none"> <li>Singh G. Information Sources, Services and Systems, 2013 Edition. Prentice Hall India Learning Private Limited</li> <li>Library Science, 2018 Edition. Ramesh Publishing House</li> <li>Subhankar Biswas, Durga Sankar Rath. Cataloguing in the New Era: Gazing through the Bodleian Catalogues to RDA, 2017 Edition. Ess Ess Publications</li> </ul>

e-Learning Source:
<a href="https://www.youtube.com/watch?v=jQIGmtY3sUw">https://www.youtube.com/watch?v=jQIGmtY3sUw</a> (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
	<b>CO1</b>	3	3	1	1	1	3	3	3	2	3			1	1	1	1	
<b>CO2</b>	3	3	1	3	3	3	1	3	2	3			1	1	1	2		
<b>CO3</b>	3	2	1	3	3	2	1	3	2	1			1	1	1	1		
<b>CO4</b>	3	2	1	3	3	3	1	3	2	2			1	1	1	1		
<b>CO5</b>	3	1	1	3	3	3	1	3	2	2			1	1	1	1		

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