

संशोधित पाठ्यक्रम

**NEW AND RESTRUCTURED
POST GRADUATE CURRICULA AND SYLLABUS**

for

Soil Science and Agril. Chemistry

Dr. Rammanohar Lohia Avadh University, Ayodhya (U.P.)

M.Sc. (Ag.) Soil Science and Agril. Chemistry

Third Semester

(Semester System as per ICAR 5th Dean Committee Recommendations)

w.e.f. 2020 - 2021

Submitted by :

Dean & Conveners, Board of Studies

Faculty of Agriculture

Dr. Rammanohar Lohia Avadh University, Ayodhya (U.P.)

M.Sc. (Ag.) Soil Science and Agriculture Chemistry

Ist Semester			Evaluation Marks			
Code No.	Course Title	Credit Hours	Mid Term	End Term	Practical	Total
SSAC - 504	Soil Mineralogy, Genesis, Classification & Survey	3(2+1)	20	50	30	100
SSAC - 509	Soil , Water and Air Pollution	3(2+1)	20	50	30	100
SSAC - 511	Analytical Techniques & Instrumental Methods in Soil and Plant Analysis	2(0+2)			100	100
AS - 501	Agricultural Statistics	3(2+1)	20	50	30	100
	Total Credit	11				
IInd Semester			Evaluation Marks			
Code No.	Course Title	Credit Hours	Mid Term	End Term	Practical	Total
SSAC - 501	Soil Physics	3(2+1)	20	50	30	100
SSAC - 502	Soil Fertility and Fertilizer Use	4(3+1)	20	50	30	100
SSAC - 503	Soil Chemistry	3(2+1)	20	50	30	100
SSAC - 506	Soil Biology & Biochemistry	3(2+1)	20	50	30	100
	Total Credit	13				
IIIrd Semester			Evaluation Marks			
Code No.	Course Title	Credit Hours	Mid Term	End Term	Practical	Total
SSAC - 505 ✓	Soil Erosion and conservation	3(2+1)	20	50	30	100
SSAC - 510 ✓	Remote Sensing & GIS Techniques for Soil, Water and Crop Studies	3(2+1)	20	50	30	100
SSAC - 513 ✓	Management of Problematic Soils & Waters	3(2+1)	20	50	30	100
CA - 502 ✓	Computer Application in Agriculture	2(1+1)	20	50	30	100
PGS - 501	Library and Information Services (Non-Gradual Satisfactory/Unsatisfactory 50% Marks required for satisfactory Grade)	1(0+1)			100	100
	Total Credit	12				
IVth Semester			Evaluation Marks			
Code No.	Course Title	Credit Hours	Mid Term	End Term	Practical	Total
SSAC - 591	Master's Seminar	1(0+1)				100
SSAC - 599	Master Research (Thesis)	20	Satisfactory/Unsatisfactory			
OR						
Special Papers - (20 - Credit) Satisfactory/Unsatisfactory						
SSAC - 514 ✓	Advanced Organic Chemistry & Plant Biochemistry	4(3+1)	20	50	30	100
SSAC - 515 ✓	Advanced Bio-pesticides & Bio-Fertilizers	4(3+1)	20	50	30	100
SSAC - 516 ✓	Soil Physical Environment and Plant Growth	4(3+1)	20	50	30	100
SSAC - 517 ✓	Soil Testing, Water Quality and Fertilizer Recommendations	4(3+1)	20	50	30	100
SSAC - 518 ✓	Modelling Soil Plant System	4(3+1)	20	50	30	100
	Total Credit	21				
	Total Credit Hours	57				

M.Sc. (Ag.) Soil Science and Agriculture Chemistry

IIIrd Semester Curricula & Syllabus

S. No.	Course Code	Title of the Course	Credit
1	SSAC - 505	Soil Erosion and conservation	3(2+1)
2	SSAC - 510	Remote Sensing & GIS Techniques for Soil, Water and Crop Studies	3(2+1)
3	SSAC - 513	Management of Problematic Soils & Waters	3(2+1)
4	CA - 502	Computer Application in Agriculture	2(1+1)
5	PGS - 501	Library and Information Services (Non-Gradual Satisfactory/Unsatisfactory 50% Marks required for satisfactory Grade)	1(0+1)
Total Credit Hours			12

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M.Sc. (Ag.)-Soil Sc. & Agri. Chem.

IIIrd SEMESTER

SSAC 505

SOIL EROSION AND CONSERVATION

3 Crs. (2+1)

Objective

To enable students to understand various types of soil erosion and measures to be taken for controlling soil erosion to conserve soil and water.

Theory

UNIT I

History, distribution, identification and description of soil erosion problems in India.

UNIT II

Forms of soil erosion; effects of soil erosion and factors affecting soil erosion; types and mechanisms of water erosion; raindrops and soil erosion; rainfall erosivity - estimation as Elm index and kinetic energy; factors affecting water erosion; empirical and quantitative estimation of water erosion; methods of measurement and prediction of runoff; soil losses in relation to soil properties and precipitation.

UNIT III

Wind erosion- types, mechanism and factors affecting wind erosion; extent of problem in the country.

UNIT IV

Principles of erosion control; erosion control measures — agronomical and engineering; erosion control structures - their design and layout.

UNIT V

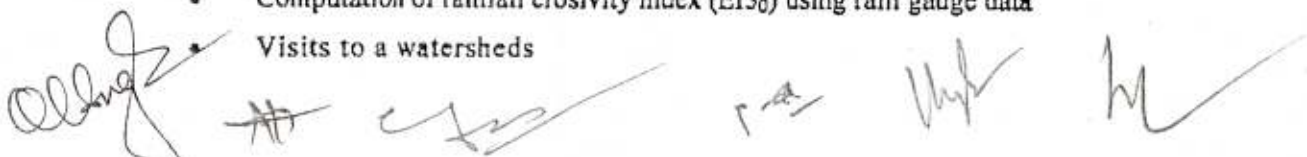
Soil conservation planning; land capability classification; soil conservation in special problem areas such as hilly, arid and semi-arid regions, waterlogged and wet lands.

UNIT VI

Watershed management - concept, objectives and approach; water harvesting and recycling; flood control in watershed management; socioeconomic aspects of watershed management; case studies in respect to monitoring and evaluation of watersheds; use of remote sensing in assessment and planning of watersheds.

Practical

- Determination of different soil erodibility indices, percolation ratio, raindrop erodibility index
- Computation of kinetic energy of falling rain drops
- Computation of rainfall erosivity index (EI_{30}) using rain gauge data
- Visits to a watersheds



SOIL, WATER AND CROP STUDIES

Objective

To impart knowledge about the basic concepts of remote sensing, aerial photographs and imageries, and their interpretation; application of remote sensing in general and with special reference to soil, plants and yield forecasting; to impart knowledge about geo-statistical techniques with special reference to krigging, and GIS and applications in agriculture.

TheoryUNIT I

Introduction and history of remote sensing; sources, propagation of radiations in atmosphere: interactions with matter.

UNIT II

Sensor systems - camera, microwaveradiometers and scanners; fundamentals of aerial photographs and image processing and interpretations.

UNIT III

Application of remote sensing techniques - land use soil surveys, crop stress and yield forecasting, prioritization in watershed and drought management, wasteland identification and management.

UNIT IV

Significance and sources of the spatial and temporal variability in soils;

variability in relation to size of sampling; classical and geo-statistical techniques of evolution of soil variability.

UNIT V

Introduction to GIS and its application for spatial and non-spatial soil and land attributes.

Practical

- Familiarization with different remote sensing equipments and data products
- Interpretation of aerial photographs and satellite data for mapping of land resources
- Analysis of variability of different soil properties with classical and geo-statistical techniques
- Creation of data files in a database programme
- Use of GIS for soil spatial simulation and analysis
- To enable the students to conduct soil survey and interpret soil survey reports in terms of land use planning

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Objective

To educate students about basic concepts of problem soils and brackish water, and their management. Attention will be on management of problem soils and safe use of brackish water in relation to crop production.

Theory

UNIT I

Area and distribution of problem soils — acidic, saline and sodic soils; origin of problematic soils, and factors responsible.

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.

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.

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.

UNIT V

Quality of irrigation water; management of brackish water for irrigation; characterization of brackish waters; relationship in water use and quality.

UNIT VI

Agronomic practices in relation to problematic soils; cropping pattern for utilizing poor quality ground waters.

Practical

- Characterization of acid, acid sulfate, salt-affected and calcareous soils
- Determination of cations (Na^+ , K^+ , Ca^{++} and Mg^{++}) in ground water and soil samples
- Determination of anions (Cl^- , SO_4^{--} , CO_3 and HCO_3) in ground waters and soil samples
- Lime and gypsum requirements of acid and sodic soils



CA - 502 COMPUTER APPLICATION IN AGRICULTURE 2 (1+1)

Theory

Introduction to computer, operating system, definition and types, application of MS-Office for document creation & Editing, Data presentation, interpretation and graph creation, statistical analysis, mathematical expressions, database concepts and types, uses of DBMS in Agriculture, World Wide Web (WWW); Memory, Basic Anatomy of Computer System. e-Agriculture concepts and applications, Use of ICT in Agriculture. IT Application for computation of water and nutrient requirement of crops, computer-controlled devices (automated system) for agri-input management, Smart phone Apps in Agriculture. Decision support systems, concepts, components and applications in agriculture.

Practical

Study of computer components, accessories, practice of important DOS Commands. Introduction of different operating system such as window, Files & Folders, File Management. Use of MS-Word and MS Power-point for creating, editing and presenting a scientific document. MS-Excel - Creating a spreadsheet, use fo statistical tools, writing expressions, creating graphs, analysis of scientific data. MS-Access - Creating database.

The image shows several handwritten signatures and initials in black ink. There are four distinct marks: a small 'AA' on the left, a large stylized signature in the center, a signature on the right that includes the number '12', and another signature below the central one.

PGS-501 LIBRARY AND INFORMATION SERVICES (0+1)

PRACTICAL

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 Data bases, Online Public Access Catalogue and other computerized library services; Use of Internet including search engine and its sources; e-resources access methods



The image contains several handwritten signatures and initials in black ink. At the top left, there is a signature that appears to be 'A. S.' followed by a horizontal line. To its right is another signature that looks like 'S. S.' with a horizontal line. Further right is a signature that appears to be 'V. S.' with a horizontal line. Below these, there is a large, stylized signature that looks like 'A. S.' with a long, sweeping tail. To the right of this large signature is a smaller signature that looks like 'M.' with a horizontal line. At the top right, there is a signature that appears to be 'V. S.' with a horizontal line.